Ten years old professional history of EPMA is rich on achievements. Herewith we briefly summarise a long list of them.

**Geographic distribution** of the PPPM-relevant expertise under EPMA-umbrella started with about 20 countries in year 2009; currently EPMA is represented in 55 countries including all the continents worldwide who actively promote PPPM concepts in bio/medical sciences and practical medicine strongly benefiting patients and healthcare systems as a whole.

**EPMA Journal, Springer Nature**, has released the very 1st issue in March 2010. In 2018 the journal has received its first IF 3.9 and the 2nd one 4.661 in this year. Citation index of the EPMA J. annually registers several publications cited by *Lancet* and *Nature*. Actually Scopus ranks EPMA J. amongst top 2% in the prestigious category “Health Policy”, due to highly requested and well-cited strategic papers created by multi-professional groups of the EPMA experts such as


This year, Scimago has top ranked EPMA J. in all three areas: “Health policy”, “Medical Biochemistry” and “Drug discovery”:

https://www.scimagojr.com/journalsearch.php?q=19700201201&tip=sid

In 2018 the below mentioned article has been awarded by Springer-Nature a status “article with a potential to change the world” in the category “Medicine and Public Health”: Pregnancy Associated Breast Cancer:

**“Advances in Predictive, Preventive and Personalised Medicine”** is a very successful EPMA / Springer Book Series which services for education for both professionals and general population. Since 2012, 11 book-volumes have been released dedicated to a whole spectrum of PPPM related aspects. 124,895 downloads have registered by Springer for the book series.

**“Horizon 2020”** is the main European Scientific Programme which EPMA has contributed to with PPPM-related protocols for creation individual calls in bio/medicine as well as with the top-expertise by Representatives and Members of the association involved in the evaluation panels.
EPMA AWARD for EXCELLENCE in BIOMEDICAL SCIENCES has been created. In 2017, the 1st EPMA award has been given to Prof. Dr. Josef Flammer, University of Basel for phenotyping of the “Flammer Syndrome”, which international jury panel by EPMA has valued as being of great clinical utility. Since this event, several international societies have awarded the discovery as particularly valuable in medicine. The first article describing the phenotype has been released by the EPMA J. in 2014. In 2019, the EPMA / Springer book “Flammer Syndrome: From Phenotype to Associated Pathologies, Prediction, Prevention and Personalisation” has been nominated for international “Bial Award in Biomedicine”.

“Young professionals in PPPM” Award has been created by the EPMA in 2015. At the international Workshops linked to the biannual EPMA World Congresses, the presentations made by young professionals are evaluated by international jury panel. The best presentations and smart PPPM concepts get awarded that effectively promotes career of young professionals in innovative bio/medical fields.

EPMA World Congress 2019 has attracted PPPM experts from 33 countries. The congress is dedicated to innovation in a broad spectrum of bio/medical fields with a specific focus on the concepts of predictive diagnostics, targeted prevention and personalisation of medical services in “Cancer”, “Metabolic Disorders”, “Cardiovascular Disease”, “Neurological, Neurodegenerative and Neuropsychiatric Disorders”, “Dentistry”, “Pain and Anxiety Disorders Management”, “Rehabilitation and Sport Medicine”, “Biobanking and Screening Programmes”, “Multi-omics”, “Microbiome, Immune-, Pre- and Probiotics”, and “Innovative Technologies”, amongst other. Further, there are several new topics presented at the congress: amongst others these are “Implementation of PPPM Concepts in Plastic Surgery”, “Application of Artificial Intelligence in Medicine – PPPM strategies” and “Medical Use of Cannabis”. The latter topic has been discussed in the EU Parliament this year, and the EPMA position has been elucidated by the EPMA Representatives; for more information see the below link:


Oral and poster presentations will provide valuable information on pilot projects towards personalised healthcare (e.g. awarded by ICPerMed), individualised patient profiles, multi-level biomarker panels, patient stratification, creation and application of innovative IT-tools, ethical issues, doctor-patient collaboration, optimal structure and organisation of the modern hospital ambitioned to practically implement the paradigm change from reactive to predictive, preventive and personalised medicine.
SCIENTIFIC COMMITTEE

Babak Baban – Augusta University (Georgia/USA)
Vivian Barak – Hadassah Medical Center (Israel)
Christoph Brochhausen – University in Regensburg (Germany)
Rostyslav Bubnov – Clinical Hospital ‘Pheophania’ of State Affairs Department (Ukraine)
Vincenzo Costigliola – European Medical Association (Belgium)
Romano Danesi – University of Pisa (Italy)
Hele Everaus – University of Tartu (Estonia)
Jiří Ferda – University Hospital in Pilsen (Czech Republic)
Jindřich Finek – Charles University (Czech Republic)
Herbert Fritsche – (Texas, USA)
Godfrey Grech – University of Malta Medical School (Malta)
Ondřej Hes – University Hospital in Pilsen (Czech Republic)
Milan Hora – University Hospital in Pilsen (Czech Republic)
Magdalena Chechlinska – Maria Skłodowska-Curie Memorial Cancer Centre and Institute (Poland)
Marko Kapalla – PPPMC (Slovakia)
Judita Kinkorová – Charles University (Czech Republic)
Radek Kučera – University Hospital in Pilsen (Czech Republic)
Ota Mayer – University Hospital in Pilsen (Czech Republic)
Mahmood Mozaffari – Augusta University (Georgia/USA)
Christine Nardini – Verona University/Karolinska Institutet (Italy/Sweden)
Dina Nikulina – Astrakhan State Medical University (Russian Federation)
Vladimír Palička – University Hospital in Hradec Králové (Czech Republic)
Friedemann Paul – Charité University Medicine Berlin (Germany)
Martásek Pavel – BIOCEV (Czech Republic)
Halina Podbielska – Wroclaw University of Technology (Poland)
Jaroslav Racek – University Hospital in Pilsen (Czech Republic)
Niva Shapira – Institute for Nutrition Research Rabin Center (Israel)
Alena Skálová – Biopsy laboratory (Czech Republic)
Drahomíra Springer – Institute of Medical Biochemistry and Laboratory Diagnostics (Czech Republic)
Štěpán Svačina – Charles University and General Faculty Hospital in Prague (Czech Republic)
Václav Šimánek – University Hospital in Pilsen (Czech Republic)
Elvar Theodorsson – Linkoping University (Sweden)
Ondřej Topolčan – University hospital in Pilsen (Czech Republic)
Vladislav Třeška – University Hospital in Pilsen (Czech Republic)
George T. Tsangaris – Academy of Athens (Greece)
Dalibor Valík – Masaryk Memorial Cancer Institute (Czech Republic)
Wei Wang – Edith Cowan University/Australia and Beijing Municipaal Key Labo (China)
Xianquan Zhan – Central South University (China)

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SCIENTIFIC PROGRAMME
<table>
<thead>
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<th>Time</th>
<th>Event</th>
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<td>9:00</td>
<td>Registration</td>
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<tr>
<td>13:00 – 14:30</td>
<td>Workshop of Young Professionals in PPPM</td>
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<tr>
<td></td>
<td>Epma Awards for the best presentation(s)</td>
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<tr>
<td></td>
<td><strong>Jury panel:</strong> B. Baban, USA (chairman); H. Podbielska, Poland; J. Polivka Jr, Czech Republic; N. Shapira, Israel; E. Theodorsson, Sweden</td>
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<tr>
<td></td>
<td>Application of artificial intelligence to the management of chronic pathologies on example of heart: Predictive, Preventive and Personalised Medical approach</td>
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<td></td>
<td><strong>Jorge Sabas Fuentes Jimenez</strong> (Erasmus Programme: Excellence University Bonn/University Madrid)</td>
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<td></td>
<td>Histopathological alteration of abdominal aortic aneurysm; tissue expression of pentraxin-3, osteoprotegerin and hypoxia-inducible factor 1-alpha</td>
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<td></td>
<td><strong>Tereza Kubiková</strong> (Charles University - Faculty of Medicine in Pilsen)</td>
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<td>Educational activity on stroke focused on the adolescent population</td>
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<td><strong>Kamila Štibránová</strong> (Charles University – Faculty of Medicine in Pilsen)</td>
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<td>Angiogenesis activation in tissue of liver metastases of colorectal carcinoma</td>
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<td><strong>Tereza Macanová</strong> (Charles University – Faculty of Medicine in Pilsen)</td>
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<td>Screening of Youth Vascular Health and Role of Modern Diagnostic Technologies</td>
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<td><strong>Victoria Kudrjavtseva</strong> (Stavropol State Medical University)</td>
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<td>Radiomics, machine learning and biobanking integrative role in PET- CT/ MRI imaging and in the medicine of the future</td>
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<td><strong>Alexandre Assuane Duarte</strong> (IMEPAC Araguari)</td>
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<td>In-depth multiomic analysis for more predictive, preventive and personalized approach in management of liver malignancies</td>
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<td><strong>Elisha Goldstein</strong> (Governmental Programme Israel/NRW, Excellence University Bonn)</td>
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<tr>
<td>14:30 – 14:45</td>
<td>Coffee Break</td>
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<tr>
<td>14:45 – 16:00</td>
<td>Workshop of Young Professionals in PPPM</td>
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<tr>
<td></td>
<td>Predictive relevance of microRNAs in patients with NSCLC undergoing palliative chemotherapy</td>
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<td><strong>Kateřina Houfková</strong> (Charles University – Faculty of Medicine in Pilsen)</td>
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<tr>
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<td>Extracellular long non-coding RNAs and mRNAs in plasma of patients with colorectal cancer</td>
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<td><strong>Pavel Ostasov</strong> (Biomedical center Charles University - Faculty of Medicine in Pilsen)</td>
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<td>Experimental liver modeling as a tool for individualized management of colorectal cancer patients and other liver pathologies</td>
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<td><strong>Anna Malečková</strong> (Charles University - Faculty of Medicine in Pilsen)</td>
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<td>Sperm histone code as a tool for personalized assessment of male fertility</td>
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<td><strong>Miriam Štavnická</strong> (Biomedical center Charles University - Faculty of Medicine in Pilsen)</td>
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<td>Individual quality of human follicular fluid predicts the success in assisted reproductive technology</td>
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<td><strong>Jan Nevoral</strong> (Biomedical center Charles University - Faculty of Medicine in Pilsen)</td>
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<td>Predictive, preventive and personalized medicine in plastic surgery</td>
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<td></td>
<td><strong>Viktoria Tsygankova</strong> (Medical University of Vienna)</td>
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<tr>
<td>16:00 – 16:30</td>
<td>EPMA Opening ceremony</td>
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<td></td>
<td><strong>Vincenzo Costigliola, Ondřej Topolčan, Olga Golubnitschaja</strong></td>
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<tr>
<td>16:30 - 16:50</td>
<td>Introductory lecture: Flammer Syndrome – From Phenotype to Associated Pathologies, Prediction, Prevention and Personalisation: a 5-year project of the EPMA expert group nominated for the international award</td>
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<td><strong>Olga Golubnitschaja</strong> (Secretary General of the EPMA)</td>
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<tr>
<td>16:50 - 17:10</td>
<td>EPMA Journal - Springer Nature overview by Grazia Laffaldano</td>
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<tr>
<td>17:10 - 17:30</td>
<td>EPMA / Springer Book series “Advances in PPPM” - overview by Ilse Krooijman</td>
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<tr>
<td>17:30 - 19:00</td>
<td>EPMA General Assembly</td>
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<tr>
<td>19:00</td>
<td>Welcome drink</td>
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</tbody>
</table>
### 20.9.2019  FRIDAY - HALL 1

#### 9:00 – 9:30  Plenary presentation
**PPPM for 21st Century Biosensing: Painless, Personalized, Point-of-Care Monitoring**  
*Russell Andrews (NASA Ames Research Center)*

#### 9:30 - 11:00  Session 1: PPPM in Cancer I

**Chairman: Hele Everaus, Vladislav Třeška**

**Anti-cancer agent resistant cell population characterization using multiple biomarkers**  
*Zane Simsone (University of Latvia)*

**Systems Medicine Approach for Individualized Management of Cancer - a Novel Way for the Progress?**  
*Hele Everaus (Tartu University Hospital/ Estonian Parliament)*

**Mesenchymal Stem Cell Application in Combination with Portal Vein Embolization is an Effective Method for Increase Future Liver Remnant Volume in Primary Non-resectable Colorectal Liver Metastases**  
*Vladislav Třeška (University Hospital in Pilsen)*

- Long-term outcomes and prognostic factors of surgical treatment for pulmonary metastases from colorectal carcinoma: a single center experience  
*Josef Vodička (University Hospital in Pilsen)*

- Outcomes for Patients after Surgical Treatment of Liver Metastases from Breast Cancer - 19 years of experience  
*Kristýna Procházková (University Hospital in Pilsen)*

- Treatment of colorectal liver and pulmonary metastases – single centre experience  
*Jakub Fichtl (University Hospital in Pilsen)*

**Coffee Break**

#### 11:00 – 13:00  Session 2: PPPM in Neurologic, Neurodegenerative & Psychiatric Disorders I & Workshop on sleep medicine

**Chairmen: Jiří Polivka and Antje Büttner-Teleaga**

**Sleep pattern as a Predictor of Sleep Disorders: Healthy Sleep to Prevent Physical and Mental Disorders, and Personalisation of Sleep Medicine**  
*Antje Büttner-Teleaga (University Witten-Herdecke and Woosuk University)*

**Anonymous online treatment and prevention of shift work sleep disorder in companies**  
*Lukas Peter (Paracelsus Medical University Nuremberg)*

**New approach to early multi-level diagnosis and correction of neurodegenerative diseases**  
*Olga Georgievna Safonicheva (First Moscow State Medical University)*

**Health and socio-economic consequences of Young Stroke**  
*Jiří Polivka (Charles university – Faculty of Medicine in Pilsen)*

**Ways to solve the problems of polymorbidity in the elderly with chronic cerebral ischemia associated with type 2 diabetes and depressive disorders**  
*Nadezhda Smirnova (First Moscow State Medical University)*

**Lunch**

#### 13:00 - 14:00  Session 4: PPPM in Neurologic, Neurodegenerative & Psychiatric Disorders II

**Chairmen: David Slouka and Friedemann Paul**

**Personalized imaging approach to the patient with suspected Alzheimer disease using brain PET/MRI**  
*Jiří Ferda (University Hospital in Pilsen)*

**Personalized approach in assessing the progressive course of non-glaucomatous optic nerve atrophy**  
*Irina Shurygina (Rostov State Medical University)*

**Flammer Syndrome and Autoimmune Inflammatory Conditions of the Central Nervous System: Multifactorial Interrelations**  
*Friedemann Paul (Charité – Universitätsmedizin Berlin)*

**Personalized approach in the quality of life evaluation in asthmatic children being prophylactically treated in pulmonological sanatorium**  
*Natalia Mokina (Samara State Medical University)*

**Population screening of premorbid disadaptation by laboratory methods**  
*Dmitry Gorshkov (Astrakhan State Medical University)*

**Unpredictable, Unpreventable and Impersonal Medicine: Addressing Disasters and Global Health with Mass Casualty Centers USA**  
*Russell Andrews (NASA Ames Research Center)*

**The Potencial of Biomarkers in Management of Diagnostic and Therapeutic Process in Obstructive Sleep Apnea Syndrome**  
*David Slouka (University Hospital in Pilsen)*

**17:00  Sightseen tour - Pilsen Brewery - Gala Dinner**
### FRIDAY - HALL 2

<table>
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<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
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</table>
| 9:00 – 9:30| **Plenary presentation - HALL 1**                                      | PPPM for 21st Century Biosensing: Painless, Personalized, Point-of-Care Monitoring  
Russell Andrews (NASA Ames Research Center) |
| 9:30 - 11:00| **Workshop: Role of multi-omics in PPPM**                              | Chairmen: Martin Pešta and Angel Alonso  
Plasma microRNA levels with CEA and CA19-9 in the follow-up of colorectal cancer patients  
Martin Pešta (University Hospital in Pilsen)  
Systematic analyses reveal long non-coding RNA (PTAF)-mediated promotion of EMT and invasion-metastasis in serous ovarian cancer  
Haihai Liang (Harbin Medical University)  
NAGEN 1,000: An example of a Regional Pilot Project for the Implementation of Personalised Genomic Medicine in the Healthcare (Project awarded by ICPMed)  
Angel Alonso (Navarrabiomed, Complejo Hospitalario de Navarra, Spain)  
Circulating tumor cells in advanced colorectal cancer  
Pavel Pitule (Biomedical center Charles University - Faculty of Medicine in Pilsen)  
Strategies to identify optimal biomarker candidate for PPP – new classes of biomarkers  
Jindra Windrichová (University Hospital in Pilsen)  
Plasma matrix metalloproteinases as biomarkers in colorectal carcinoma  
Marie Karlíková (University Hospital in Pilsen) |
| 11:00 – 11:30| **Coffee Break**                                                 |                                                                        |
| 11:30 – 13:00| **Session 3: PPPM in Cancer II - EGTM session (11:30 - 13:30)**         | Chairmen: Herbert Fritsche and Xianquaon Zhan  
sIL-2R- an Immuno-Biomarker for Cancer Patients  
Vivian Barak (Hadassah Medical Center)  
New Biomarkers for Detection of Ovarian Cancer  
Herbert Fritsche  
Biomarkers: The Key to Personalised Treatment for Cancer  
Michael Joe Duffy (University Hospital Dublin)  
CLAUDIA algorithm in the diagnosis and histological diagnosis of lung cancer  
Rafael Molina (Biomedical Diagnostic Center)  
Individual surgical approach in management of BRCA mutation carriers – experience of our center  
Inka Třešková (University Hospital in Pilsen)  
Personalized management of primary brain tumors, are we there yet?  
Jiří Políkva jr. (Charles University – Faculty of Medicine in Pilsen)  
Predictive role of primary tumour sidedness in patients with metastatic colorectal cancer treated with anti-EGFR monoclonal antibodies or bevacizumab in the first line  
Ondřej Fiola (University Hospital in Pilsen)  
How to establish reference ranges of the age and gender dependent biomarkers  
Radek Kučera (University Hospital in Pilsen)  
Lunch |
| 13:00 - 14:00| **Session 5: PPPM in Cardiovascular diseases**                        | Chairmen: Baofeng Yang and Maria Esevyeva  
The Role of Non-coding RNAs in Malignant Cardiac Diseases  
Baofeng Yang (Harbin Medical University)  
N-Terminal Pro Brain natriuretic peptide as a predictor of complications in cardiосurgical patients  
Nina Zarandiya (Astrakhan State Medical University)  
Home Monitoring of Patients with Parkinson’s Disease  
Klaudia Kozłowska (Wroclaw University of Science and Technology) Název  
Vitamin K status independently influenced individual course of age-dependent arterial stiffening  
Otto Mayer (University Hospital in Pilsen), Jitka Seidlová (Charles University - Faculty of Medicine in Pilsen)  
The syndrome of early vascular aging and health protection system of youth  
Maria Esevyeva (Stavropol state Medical University)  
Unstable atherosclerotic plaque and elevation of Lp-PLA2 as stroke predictors in patients with asymptomatic internal carotid artery stenosis  
Ivan Kopolovets (Uzhhorod National University)  
Predictive role of cardiac troponins in acute and chronic settings  
Daniel Rajdl (University Hospital in Pilsen)  
Lunch |
| 17:00       | **Sightseen tour - Pilsen Brewery - Gala Dinner**                     |                                                                        |
### FRIDAY - HALL 3

#### 20.9.2019

<table>
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<tr>
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<tr>
<td>9:00 – 9:30</td>
<td><strong>Plenary presentation - HALL 1</strong></td>
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<tr>
<td></td>
<td>PPPM for 21st Century Biosensing: Painless, Personalized, Point-of-Care Monitoring</td>
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<td></td>
<td>Russell Andrews (NASA Ames Research Center)</td>
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<tr>
<td>9:30 – 11:00</td>
<td><strong>Workshop: PPPM - Advanced imaging and personalised therapy of malignant tumors</strong></td>
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<tr>
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<td>Chairman: Jiří Ferda</td>
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<td>A personalized approach to differential diagnostics in imaging of peripheral lung adenocarcinoma</td>
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<td>Hynek Mirka (University Hospital in Pilsen)</td>
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<td>Combination of functional imaging in non-invasive lung carcinoma phenotype assessment, an individualized prediction of treatment response and follow-up</td>
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<td>Jan Baxa (University Hospital in Pilsen)</td>
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<td>A contribution of 18F-FDG-PET/MRI in newly diagnosed breast carcinoma to the personalized therapy</td>
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<td>Jiří Ferda (University Hospital in Pilsen)</td>
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<tr>
<td>11:00 – 11:30</td>
<td><strong>Coffee Break</strong></td>
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<tr>
<td>11:30 – 13:00</td>
<td><strong>Workshop: PPPM - Diagnostic difficulties and problem solving advanced imaging strategies</strong></td>
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<td>Chairman: Jan Baxa</td>
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<td></td>
<td>Personalized imaging approach to the patient with suspected transthyretin myocardial amyloidosis</td>
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<td>Jan Baxa (University Hospital in Pilsen)</td>
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<td>A role of 18F-FDG-PET/CT in detection of the cause of the sepsis and its impact on treatment decision making</td>
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<td>Jiří Ferda (University Hospital in Pilsen)</td>
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<td>Contrast enhanced ultrasound in detection of the endoleak: a possible role in personalized approach to the follow-up after endovascular repair of the abdominal aneurysm</td>
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<td>Hynek Mirka (University Hospital in Pilsen)</td>
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<td>Future directions of prostate cancer theranostics</td>
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<td></td>
<td>Jakub Šimeček (ITG Isotope Technologies Garching GmbH)</td>
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<tr>
<td>13:00 – 14:00</td>
<td><strong>Lunch</strong></td>
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<tr>
<td>14:00 – 16:00</td>
<td><strong>Workshop: PPPM in Prostate Cancer</strong></td>
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<td>Chairman: Milan Hora</td>
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<td>Surgical therapy of prostate cancer in the Czech Republic and particularly in Pilsen</td>
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<td>Milan Hora (University Hospital in Pilsen)</td>
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<td>The diagnostic and therapeutic prostate cancer algorithm</td>
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<td></td>
<td>Hana Sedláčková (University Hospital in Pilsen)</td>
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<tr>
<td></td>
<td>New potential molecular biomarkers in prostate cancer</td>
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<td></td>
<td>Hana Řezáčková (University Hospital in Pilsen)</td>
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<td></td>
<td>The influence of different treatment methods used in prostate cancer on PSA response with a special focus on radiation therapy</td>
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<td></td>
<td>Tomáš Svoboda (University Hospital in Pilsen)</td>
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<td>PHI and related case reports</td>
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<td>Ondřej Topolčan (University Hospital in Pilsen)</td>
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<td>Newly diagnosed prostate carcinoma: a contribution of 68Ga-PSMA-PET/MRI in personalized therapy decisions making</td>
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<td>Jiří Ferda (University Hospital in Pilsen)</td>
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<tr>
<td>17:00</td>
<td><strong>Sightsee tour - Pilsen Brewery - Gala Dinner</strong></td>
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**EPMA World Congress 2019**  
**September 19-22, Pilsen, Czech Republic**
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>9:00 – 9:30</td>
<td>Plenary presentation</td>
<td>An overview of Medicinal Cannabis and potential for PPPM Babak Baban (Augusta University)</td>
</tr>
</tbody>
</table>
| 9:30 – 11:00 | Session 6: PPPM in Pain and Anxiety disorders management                | **Chairman:** Mahmood Mozaffari, Ondřej Topolčan  
Opioid Crisis and Potential of Cannabinoids for Pain Control Mahmood Mozaffari (Augusta University)  
Personalized treatment of anxiety disorders Vladimir Malakhovskiy (First Moscow State Medical University) |
|              | Session 8: Role of Sport Medicine & Rehabilitation in PPPM Strategies  | **Chairmen:** Niva Shapiro and Halina Podbielska  
Consensual reaction as an indication for personalization of physiotherapeutic treatment Halina Podbielska (Politechnika Wrocławska)  
Ultra-marathon athletic events - healthy or hazardous? Jaroslav Novák (Charles University – Faculty of Medicine in Pilsen)  
Urbanisation demands novel rehab, individualized high-tech PPPM solutions for megapolis patients Lev Kalika (New York Dynamic Neuromuscular Rehabilitation) |
| 11:00 – 11:30| Coffee Break                                                           |                                                                                                         |
| 11:30 – 13:00| Session 9: PPPM in Metabolism and Metabolic Syndromes I                | **Chairmen:** Richard Pikner and Ivica Smokovski  
Diabetes and PCOS Šárka Svobodová (General University Hospital in Prague)  
Predicting Cardiovascular Events in Diabetes Ivica Smokovski (University Goce Delcev Stip)  
Myofascial trigger points as potentially underestimated hypoxic niches – considerations towards specific phenotype, patient stratification, preventive and personalised treatments Rostyslav Bubnov (Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine)  
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| 13:00 – 14:00| Lunch                                                                   |                                                                                                         |
| 14:00 – 15:30| Session 11: Role of Biobanking and Screening Programs in PPPM           | **Chairmen:** Christoph Brochhausen and Judita Kinkorová  
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D vitamin and Pregnancy Ondřej Topolčan (University Hospital in Pilsen)  
Pregnancy associated and antenatal proteins are markers of fetal development and newborn conditions Dina Nikulina (Astrakhan State Medical University)  
Screening of Down syndrome Drahomira Springer (Institute of Medical Biochemistry and Laboratory Medicine)  
Possibilities and importance of screening thyroid disorders in pregnancy. Drahomira Springer (Institute of Medical Biochemistry and Laboratory Medicine)  
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| 15:30 – 16:00| Coffee Break                                                           |                                                                                                         |
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<td><strong>Chairmen: Lukáš Hauer, Tatiana Kupets and Anatoly Kunin</strong></td>
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<td>The impact evaluation of the electromagnetic field (EMF) on polymer based filling materials according to the clinical studies for the personalized prevention of secondary caries</td>
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<td>Natalia Moiseeva (Voronezh State Medical University named after N.N. Burdenko)</td>
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<td>Prevention of the systemic somatic pathology based on the dental status findings</td>
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<td>Kristina Kubyshkina (Voronezh State Medical University named after N.N. Burdenko)</td>
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<td>Prevention of a tooth sensitivity after professional teeth whitening</td>
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<td>The DPPPD-EPMA conception in predictive, preventive and personalized dentistry</td>
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<td>Clinical effectiveness evaluation of remineralization therapy in children with oncology disorders undergoing chemotherapy</td>
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<td>Early surgical management of medication-related osteonecrosis of the jaw in cancer patients</td>
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<td>Justification of a personalized approach at the stages of conservative initial and supportive periodontal therapy</td>
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<td>Ekaterina Loboda (City Periodontal Center „Poks“ Ltd.)</td>
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<td>Emotional Self-Regulation and its Relation to Quality of Individual Oral Care</td>
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<td>Vitamin D - base characteristics and metabolic effects, key points and PPPM relations</td>
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<td>Radek Kučera (University Hospital in Pilsen)</td>
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<td>25-OH VITAMIN D status in patients with breast and prostate cancer in the Czech Republic</td>
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<td>Biomarkers in combination with other prognostic and predictive factors - invididualized multivarite statistical models for risk estimation and optimal therapy selection</td>
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<td>A new version of BIANTA and CRACTES software to help in the interpretation of tumor markers in different in different periods of cancer disease</td>
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<td>Ladislav Pecen (University Hospital in Pilsen)</td>
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<td>Statistical steps which should be done in each study in medical research</td>
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## EPMA World Congress 2019
**September 19-22, Pilsen, Czech Republic**

### 22.9.2019  SUNDAY - HALL 1

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Christopher Gerner |

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Rostyslav Bubnov (Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine)  
Creation of lactobacilli based Immunobiotics for prevention and treatment of infectious-inflammatory diseases of the human urogenital system  
Nadiya Boyko (Uzhhorod National University) |

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Christopher Gerner |

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George Tsangaris (Biomedical Research Foundation of the Academy of Athens)  
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Ubiquitinated Proteins in the Human Pituitary and Pituitary Adenomas  
Dominic M. Desiderio (University of Tennessee Health Science Center)  
Energy metabolism heterogeneity-based molecular pattern biomarker in ovarian cancer  
Xianquan Zhan (Xiangya Hospital, Central South University) |

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Christopher Gerner |

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Lucie Habartová (University of Chemistry and Technology Prague)  
DIANA technology: unique tool for selectivity profiling of drug candidates and for biomarker detection  
Václav Navrátil (DIANA Biotechnologies)  
Mechanosensing and mechanotransduction, overlooked biological features in inflammation  
Christine Nardiny (Karolinska Institute, Huddinge, Sweden)  
DECISION SUPPORT TOOLS for clinicians in complex environments  
Jaroslav Vohánka (ROCHE s.r.o. Diagnostics Division)  
Short Communication and Closing Remarks  
Godfrey Grech (University of Malta) |

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<td>Liver carcinomas: the emergent field for the paradigm shift from reactive to predictive, preventive and personalised medicine</td>
<td>Anastasii Barilo</td>
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<td>Nadiya Boyko</td>
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<td>PPPM in Cardiovascular Diseases</td>
<td>Vascular remodeling in young people, taking into account various forms of focal infection</td>
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<td>FTIR-spectroscopic markers in dentine and gingival fluids for preventive diagnostic of pathology carious processes in human dentine</td>
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<td>Oral cavity hygiene in non-ferrous metal workers in Russia and Uzbekistan</td>
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<td>Planning and implementation of personalized programs for periodontal disease prevention</td>
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<td>PPPM in dentistry</td>
<td>Prevention of endodontic therapy complications by modification of sealers on epoxy reisin basis</td>
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<td>Prevention of pain during endodontic treatment</td>
<td>Natalia Chirkova</td>
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<td>PPPM in dentistry</td>
<td>Systemic approach to the development of a professional oral hygiene program among patients with diabetes mellitus.</td>
<td>Eleonora Grinenko</td>
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<td>The morphology alteration of polymer based toothpastes with the electromagnetic field exposure for the predictive caries prevention.</td>
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<td>The Text neck syndrome effect on microcirculation of periodontal tissues blood vessels.</td>
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<td>Some views of Avicenna on dental hygiene</td>
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<td>PPPM in Metabolism and Metabolic syndromes</td>
<td>Flammer's syndrome and pregnancy in terms of neonatal development and vascular status of pregnant women</td>
<td>Maria Evseyeva</td>
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<td>Role of Microbiome, Immune-, pro- and pre-biotics in PPPM</td>
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<td>Dariia Radchenko</td>
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<td>Role of Sport Medicine &amp; Rehabilitation in PPPM Strategies</td>
<td>Role of soluble adhesion molecules in prediction of results of biological therapy in rheumatoid arthritis</td>
<td>Vijaya Jawahar Sarithala</td>
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ABSTRACTS

(sorted alphabetically according to the surname of the main author)
Alonso, Angel, MD, PhD.

Biography:
Consultant Clinical Geneticist. After graduating at medical school Alonso was trained as a Clinical Geneticist and researcher in Human Genetics, serving in several senior clinical positions and research groups leaderships over the last 20 years in Spain and the UK. In 2014, while holding a position at the NENC NHS Genomic Medicine Centre for the Genomics England 100,000 Genomes project, he felt strongly committed to the implementation of genomic medicine in Public Health Services in Spain, which resulted in setting and taking up the lead of the new Genomic Medicine Unit of Narrabiomed and its NAGEN strategy, which has now raised €6M for 3 R&D projects on PM over the last 4 years. Alonso became an advisor for the Spanish Senate Initiative for a National Strategy on Genomics and PM (2018) and he’s currently the secretary of the PM section of the Spanish Association of Human Geneticists. His authored publications have been cited over 3,000 times in medical journals, H-index 16.

Title:
NAGEN 1,000: An example of a Regional Pilot Project for the Implementation of Personalised Genomic Medicine in the Healthcare

Authors:
Alonso, A.1, Pasalodos, S.1, Brennan, P.2, Gut, I.3, Dopazo, J.4, Pinillos, I.5, Gonzalez, L.A.6, Lasa, I.1
1Genomic Medicine, Navarrabiomed, Complejo Hospitalario de Navarra (CHN)-Universidad Pública de Navarra (UPNA), IDISNA, Pamplona, Spain; 2NENC NHS Genomic Medicine Centre, Newcastle upon Tyne, UK; 3Centro Nacional de Análisis Genómicos CNAG, Barcelona; 4Bioinformatics Platform CIBERer, Seville; 5Navarra de Servicios y Tecnología NASERTIC; 6 AVANTIA 400+, Spain

Abstract:
“NAGEN 1,000” is a Spanish regional pilot study incorporating recent advances in cutting edge genomic research technology (Whole Genome Sequencing) into the real clinical practice. This project addressed the difficulties for this implementation and provided original solutions to overcome the main barriers for genomic medicine progression, i.e. healthcare workforce education and public empowerment, optimized use of available infrastructures and resources, adaptation of pre-existing electronic health records, provision of big data analysis and ICT innovations, and ELSI regulations. With an expected recruitment of 1,000 rare disease patients and their relatives to the end of 2019, NAGEN has already produced complex genetic diagnoses for one third of the participating families, found transcendent genetic variations related to personal risk in 1 out of 20 enrollees, and identified a mean of 3.5 actionable pharmacogenomic variants per person in 100% of participants. Further, strong candidate genomic findings, potentially explaining patients’ diseases, have been found in an additional 40% of the cohort, paving the way for new diagnoses and collaborative research projects in the future. “NAGEN 1,000”, which was awarded as the Best Practice in Personalised Medicine by ICPerMed in 2018, illustrates how translational research and innovation in the field of genomics and personalised medicine is already delivering benefit to real patients.
Andrews, Russell J.

Biography:
Russell J Andrews’ training included: doctorate (Human Development - Harvard), neurosurgery residency (Stanford), 6 months at the National Hospital, Queen Square, London. Experience: two years - US Army Flight Surgeon; 15 years - university neurosurgery faculty; 15 years - private practice neurosurgery (Silicon Valley); 22 years (to present) medical advisor NASA Ames Research Center (Nanotechnology and Smart Systems). Appointments include: Past Chair, International Committee, American Association of Neurological Surgeons; Newsletter Editor, World Federation of Neurosurgical Societies (WFNS); board member of several medical societies; President, International Conference on Neuroprotective Agents (ICNA); member, WFNS Neurotrauma, Mass Casualty, Neurorehabilitation Committees. He is a founder of the Mass Casualty Center Project to address both natural and man-made disasters (plus daily emergency care) internationally, author/co-author of over 125 articles/chapters, and over 300 presentations at scientific conferences worldwide (many as invited speaker). Books: (1) Editor: Intraoperative Neuroprotection. Williams & Wilkins, 1996; (2) Author: Too Big to Succeed: Profitiering in American Medicine. iUniverse, 2013. Together with NASA colleagues, he holds medical device patents.

Title:
PPPM for 21st Century Biosensing: Painless, Personalized, Point-of-Care Monitoring

Author:
Andrews, R. J.1,2
1World Federation of Neurosurgical Societies, Nyon, Switzerland
2Nanotechnology & Smart Systems, NASA Ames Research Center, Moffett Field, CA, USA

Keywords:
diabetes, glucose, interstitial fluid, point-of-care, saliva, smart skin, sweat, tears, wearable devices

Abstract:
A recent publication notes the trend in biomonitoring: from “sample to lab” to “lab to sample” to “wear the lab” to “attach/implant the lab”.

The progress in systemic biomonitoring might be called advances in the “Body-Machine Interface” (BMI) in concert with the well-recognized “Brain-Machine Interface” (also BMI). In both instances, advances in sensor efficacy and miniaturization, microchip computing, and wireless communication are making 20th century science fiction a 21st century reality. From a Fitbit monitoring heart rate and “pedestrian” exercise to smartwatches/patches/ingestibles with monitoring capabilities scarcely imagined a decade ago – progress!

Two keys to next-generation BMI are (1) the technological advances noted above (i.e. a more sophisticated “machine”), and (2) intimate knowledge of the “body” (the skin, the eye, the oral to anus gastrointestinal tract, etc). Much of the work to date has focused on minimally-invasive monitoring of glucose, given the increasing incidence of diabetes worldwide - but other applications may prove to be lower-hanging fruit.
The challenges posed for monitoring biochemical markers in interstitial fluid, sweat, and tears in particular are considered. Advances in fields such as microfluidics and soft nanomaterial patches are resulting in devices attached to the skin (or, e.g., a contact lens) that can monitor one or more biofluids for weeks at a time. Harvesting power from the body itself (i.e. with changes in temperature or pressure) can make continuous wireless monitoring feasible.

The goal – personalized, painless theranostics (e.g. a closed-loop diagnostic and therapeutic device for diabetics) – is on the horizon.

Title:

Unpredictable, Unpreventable and Impersonal Medicine: Addressing Disasters and Global Health with Mass Casualty Centers

Author:

Andrews, R. J.1,2

1World Federation of Neurosurgical Societies, Nyon, Switzerland
2Nanotechnology & Smart Systems, NASA Ames Research Center, Moffett Field, CA, USA

Keywords:
disaster response, global surgery, mass casualties, mobile surgery, telemedicine

Abstract:

One-third of all deaths worldwide result from lack of surgical care, e.g. trauma, difficult childbirth, noncommunicable diseases. Disasters – both natural and man-made (from infrastructure failures to terrorism) – claim 100,000s of lives annually. If this lack is not addressed, GDP loss will exceed US$1T by 2030.

Trauma and stroke centers (TSCs) evolved with evidence that "24/7/365" treatment dramatically improved morbidity/mortality. TSC equipment/personnel are an integral part of healthcare systems. Mass Casualty Centers (MCCs) – similarly integrated – provide resilient infrastructure that augments the daily healthcare of the regions served. MCCs include mobile operating rooms (including a car battery-powered CT, portable by helicopter), telemedicine/telesurgery, and drones (e.g., identify the living buried in rubble, optimize triage). MCCs integrate civilian and military emergency medical resources, and combine developing and developed country personnel. Cutting-edge data collection/analysis across MCCs facilitates uniformly high-standard medical education and quality assurance.

Initial MCC sites are Iquique (Chile) and Peshawar (Pakistan). United civilian and military resources improve emergency care (both daily and mass casualty); in Pakistan the new nationwide plans for improving both nursing and surgical care by 2025 will incorporate the MCC concept.

MCCs encompass all aspects of healthcare – from prevention (Peshawar received the ThinkFirst 2019 International Chapter Award) to prehospital care (Peshawar began ambulance service in 2017) to acute critical care/surgery to rehabilitation. Additionally, the MCC network establishes global training standards and provides universal research platforms.

There are political, cultural, and socioeconomic benefits - beyond the healthcare benefits - of integrating MCCs into the global healthcare system.
Title:
Radiomics, machine learning and biobanking integrative role in PET-CT/ MRI imaging and in the medicine of the future.

Authors:
Assuane Duarte, Alexandre¹, Hüllner, M.W.²

¹Instituto Master de Ensino Presidente Antonio Carlos (IMEPAC Araguari), Araguari, Minas Gerais, Brazil.
²University Hospital of Zürich, Department of Nuclear Medicine, Zürich, Switzerland.

Abstract:
PET-CT/MRI are technologically advanced hybrid imaging modalities, which combine anatomic, quantitative and qualitative data with functional information derived from PET to assess tumors, predict tumor progression and personalize treatment approaches. New emerging technologies such as multiomics, radiomics, machine learning, and biobanking play an important role in PPPM strategies as the medicine of the future. These technologies, when integrated, may provide powerful information to physicians and healthcare systems in the era of individualized medicine. In the modern healthcare era, there is an increased need to develop AI mechanisms such as machine learning to translate quantitative data into patient-tailored, precise and clinically relevant data with minimal error and large scale analysis to diminish personal burden. Recent findings and future perspectives of how multiomics, machine learning and biobanking integrated with modern imaging modalities are analyzed in this paper. The role of emerging technologies in PPPM is discussed.
Baban, Babak, Ph.D., MPH, MBA, FAHA, Associate Professor

Biography:
Dr. Babak Baban is an Associate Professor of Immunology at Departments of Oral Biology and diagnostic Sciences, Dental College of Georgia, Departments of Neurology and Department of Surgery, Medical College of Georgia, at Augusta University of Augusta GA in the USA. He received his Ph.D. from University of London in United Kingdom followed by completion of his postdoctoral fellowship in molecular immunology at the Medical College of Georgia in the USA. With over 20 years of experience as a translational and clinical immunologist, Dr. Baban's research is focused on the mechanisms underlying the regulation of the innate and acquired immune system. In addition he is serving as a member of editorial board, and reviewer for several prestigious scientific journals as well as study sections. He has published more than 100 peer review published articles, as well as several book chapters. He has been member of EPMA since 2011.

Title:
An overview of Medicinal Cannabis and the potential for Preventive, Predictive and Personalized Medicine.

Author:
Baban, B.
Department of Oral Biology and Diagnostic Sciences
Dental College of Georgia, Augusta University
Augusta, GA, USA

Abstract:
The global demand for medicinal cannabis is rapidly growing. Although the use of cannabis for medical purposes dates back to 1400 B.C., however, there are multiple challenges before cannabis can be permitted as an approved medication. Apart from legal, political and economical issues associated with the use of medical cannabis, the scientific based research to unravel the mechanisms responsible for the interaction of cannabis within human body has significantly intensified and proliferated in recent years. The main focus of such effort is mainly to weigh carefully the potential benefits of medicinal cannabis versus complications and difficulties associated with medical cannabis. Interestingly, the new findings related to the human endocannabinoid system, its receptors and role in the homeostatic and physiologic functions have provided many new areas of research to be explored. In fact, the widespread presence of endogenous cannabinoid system in the central and peripheral tissues conceivably account for the myriad effects and therapeutic potential of cannabinoids. Collectively, with all historic and current scientific findings, it is maybe the appropriate timing for the medicinal cannabis to be contemplated in a setting of Preventive, Predictive and Personalized medicine. This is a quite unique opportunity to bring an old player in a new game. All evidence supports the notion that the medicinal cannabis maybe used as a safe and effective medicine to address a need for a new class of medication maybe administered effectively as a modality of treatment.
Barak, Vivian, PhD, Professor

Biography:

Education: BSc, MSc, PhD- from Hebrew University, Jerusalem; Visiting Scientist-at Sloan Kettering, NY and MD Anderson- Houston, USA;

Since 1985: Head, Immunology & Tumor Diagnosis Lab, Oncology Dep., Hadassah-Hebrew University Medical Center, Jerusalem, Israel

Since 2005: Associate Professor in Oncology at Hebrew University; Head, Israeli Cytokines Standardization Lab.; Head, Israeli Tumor Markers Standardization Lab.; Validation expert in Biomarkers and Immune status of Cancer patients; Senior Consultant; Teaching at School of Medicine, Hebrew University, Jerusalem; Teaching /Supervising theses, PhD, MSc, MD- 43 students

Functions in Israeli Universities: Member, Central Admitting Committees to Medical Schools, Reviewer of MSc, MA, PhD Studies, Awards, Grants, Member of Steering Committee for Teaching Laboratories.

Member - Editorial Boards of International Journals: European Cytokine Network, Tumor Biology, In Vivo, Int. J of Cancer, Cancer Biomarkers, Biomarkers and Environment, Current Oncology, Tumor Markers Oncology, Int. J of Biomarkers, Biomedicine and Pharmacotherapy

Positions in International Societies: past - ISOBM President; present – ISOBM, EGTM and IATMO Board member, ARVO- Women in Science Board member, European Research Council member, Int. Scientific Advisory Board of IIAR


Member: 30 Scientific Committees of International Conferences, 13 Scientific Societies

Recipient of ISOBM ABBOTT AWARD 2017

List of publications includes: 264 papers in International Journals, 16 in Israeli Journals

Research Gate (RG): Score- 45.31, Impact points- 837, Citations- 6908, Reads- 10527, Research items- 303

H-index: 44.5

Title:

A Significant Clinical Role of the Immune Biomarker sIL-2R for Cancer Patients

Authors:

Barak, V.

Head, Immunology Lab for Tumor Diagnosis, Hadassah- Hebrew University Medical Center, Jerusalem, Israel

Abstract:

sIL-2R is an Immune Biomarker and its blood levels can be used in Various Malignancies in order to:
- distinguish between Cancer patients and normal controls
- distinguish between subgroups of patients (with or without metastases, active vs non-active disease)
- evaluate response to therapy
- provide prognosis for patients

I intend to present our results for patients with Breast Cancer, Melanoma-both Cutaneous and Uveal, Head and Neck Cancer, etc.

-our results are in concordance with other studies performed all over the world

In conclusion, sIL-2R is a sensitive and reliable Immune Biomarker and should be used routinely in Oncology.
Barilo, Anastasiia

**Biography:**
Master student, Bonn university

Research interests: Personalised predictive and preventive medicine, Molecular biology, Bioinformatics, Computational Biology

Education: Bonn University, 2018 –Present, Msc Molecular Biology and Biotechnology

University of Plymouth, 2015-2018, Bsc Marine Biology

Plymouth University International College, 2014-2015

Foundation Year: Biology (A), Chemistry (A), Math (A), Physics(A), English(A), ITC(A), Scientific methods (A); PUIC Academic Merit Scholarship; Presidential Physics and Mathematics Lyceum №239 (Best school in Russia 2015, 2016, 2017) 2012-2014

Professional experience: Lab work experience included long-term volunteering and honours project with Plymouth Marine Laboratory (Mike Allen’s group, algal biotechnology), project at Sydney University of Technology on bacteria-protozoa interactions (Diane McDougald’s group), internships at Marine Biological Association on fungi discovery


E-mail: bariloa96@gmail.com

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**Title:**
Liver carcinomas: the emergent field for the paradigm shift from reactive to predictive, preventive and personalised medicine

**Authors:**
Barilo, A.1, Golubnitschaia, O.2,3,4

1Center of Molecular Biotechnology, Rheinische Friedrich-Wilhelms-University of Bonn, Germany

2Radiological Clinic, Rheinische Friedrich-Wilhelms-University of Bonn, Germany

3Breast Cancer Research Centre, Rheinische Friedrich-Wilhelms-University of Bonn, Germany

4Centre for Integrated Oncology, Cologne-Bonn, Rheinische Friedrich-Wilhelms-University of Bonn, Germany

**Abstract:**
Liver carcinomas (LC) with highly heterogeneous origin are one of the most widespread and severe cancer forms worldwide with particularly poor prognosis. Besides the primary liver tumours, almost any malignancy could metastasise to the liver. To this end, the liver is one of the predominant sites for the breast cancer metastases contributing with 21% to all the cases with liver metastases. Liver cancer is sixth common worldwide cancer resulting in 782,000 new cases in 2012.
Noteworthy for the absolute majority of LC cases, modifiable risk factors play the decisive role in the pathology manifestation and progression and could be prevented by targeted measures that should be well considered for educational programmes in the population.

Due to the current lack of effective strategies for LC prevention and targeted screening programmes, the disease is frequently diagnosed at advanced stages followed by palliative treatment with 5 years survival rates by 0-10%. In contrast, early diagnosed patients have been demonstrated as cured with significantly better success, however currently still with 50% reoccurrence rate and about 25% survival within 5 years. To this end, the main problem is an extremely high heterogeneity of the LC patient cohort that requires a paradigm change from cost-ineffective reactive medical services to an advanced predictive, preventive and personalised medicine approach based on the targeted preventive measures utilising educational programmes, innovative population screening, early multi-level diagnostics, improved patient stratification, and treatment algorithms tailored to the person.

References:


Golubnitschaja, O., Yeghiazaryan, K., Stricker, H., Trog, D., Schild, H. and Berliner, L. (2016). Patients with hepatic breast cancer metastases demonstrate highly specific profiles of matrix metalloproteinases MMP-2 and MMP-9 after SIRT treatment as compared to other primary and secondary liver tumours. BMC Cancer, 16(1).

Baturin, Vladimir Alexandrovich, Grand Ph.D. in Medical sciences, Professor

Biography:
Vladimir Alexandrovich Baturin graduated from the medical faculty of the Chita State Medical Institute of the Russian Federation. He defended his candidate thesis in 1980. He defended his doctoral thesis on the topic "Chronobiological aspects of the pharmacodynamics of antidepressants" in 1993. The American Biographical Institute included him among the "500 leaders of science" in 2003. Original, highly effective methods of the definition of infectious agents, diagnosing drug allergy under his supervision were developed and put into practice. He is the author of 6 patents for invention. Nowadays, he works as Head of the Department of Clinical Pharmacology, Allergology and Immunology with a course of additional postgraduate education in the Stavropol State Medical University. He is an author of more than 500 articles in medical journals with more than 1,300 citations in the available literature, H-index is 18.

Boshyan, Roberta Ovikovna

Biography:
Postgraduate Student, Department of Clinical Pharmacology, obstetrician-gynecologist. Roberta Ovikovna Boshyan graduated from Stavropol Medical University with honors in 2011. She graduated from the residency in obstetrics and gynecology in 2014. Boshyan has been working as an obstetrician-gynecologist at the Center for Clinical Pharmacology and Pharmacotherapy in the city of Stavropol since 2015. She is studying in graduate school at the Department of Clinical Pharmacology under the guidance of Professor Vladimir Baturin since 2016. Boshyan is an employee and local coordinator of the Project Office of the Stavropol Medical University in the field of preventive, predictive, personalized medicine since 2018.
Title:

DEFa1 and DEFb1 in the role of biomarkers of predisposition to the activation of infectious process in inflammatory diseases of the pelvic organs in women

Authors:

Baturin, V. A.1,2, Boshyan, R. O.1,2
1Stavropol State Medical University, Russia
2Center for Clinical Pharmacology and Pharmacotherapy, Stavropol, Russia

Abstract:

DEFa1 and DEFb1 are one of the first lines of defense against the entry of bacteria, fungi and viruses. DEFa1 is involved in oxygen-independent destruction of phagocytosed microorganisms, in the systemic immune response. DEFb1 is released on the mucosal surface and provide its anti-infective protection. The lack of defensins synthesis leads to the development of infectious and inflammatory complications. We studied the levels of DEFa1 and DEFb1 in the blood and studied the species composition of the microflora of the urogenital tract in 153 women of reproductive age in the city of Stavropol of the Russian Federation. The subjects were divided into groups: with minimal clinical symptoms of the infectious process, with moderate, with severe. The concentration of DEFa1 was in the group with minimal symptoms of 21.1 ± 6.5 ng / ml, and DEFb1 was 75.6 ± 14.4 ng / ml (p <0.05). The level of DEFa1 was 46.5 ± 12.5 ng / ml, and DEFb1 was 27.3 ± 7.8 ng / ml (p<0.05) in the group of women with severe symptoms. Concentration of DEFb1 had more high values 90.2 ± 35.7 ng / ml in women at the end of the second menstrual cycle, and a very high correlation was found between the number of leukocytes in flora smears and the expression of DEFb1(r = 0.97, p <0.05). The authors recommend taking into account the concentration of DEFa1 and DEFb1 in the blood of women as a predisposition to the activation of the infection process during inflammatory diseases of the pelvic organs.
Baxa, Jan, M.D., Ph.D., Associate Professor

Biography:
Jan Baxa graduated from Charles University, Faculty of Medicine in Pilsen (1998) and became resident at the Department of Imaging Methods at University Hospital Pilsen. He took a Ph.D. degree in 2011 at the same Faculty with the doctoral thesis: “Non-invasive cardiac imaging in diabetes”. In 2016 he defended habilitation thesis on the topic “Advanced techniques of application and functional evaluation of iodine contrast agent in CT examination” and got the degree of Associate professor. He acquired full specialization in Radiology and Nuclear medicine. Currently, he works as a senior consultant and section leader for Computed tomography and teaches Radiology at the Faculty of Medicine in Pilsen. His main object is cardiac and oncological imaging, participates in research. He is an author or co-author of more than 300 articles in medical journals with more than 300 citations in the available literature, H-index 9.

Title:
Combination of functional imaging in non-invasive lung carcinoma phenotype assessment, an individualized prediction of the treatment response and follow-up

Authors:
Baxa, J.1, Pešek, M.2, Svatoň, M.2, Krákorová, G.2, Hošek, P.3, Ludvík, J.1, Ferda, J.1
1Department of Imaging Methods, University Hospital in Pilsen, Czech Republic
2Department of Pulmonary diseases, University Hospital in Pilsen, Czech Republic
3Biomedical centre, Faculty of Medicine in Pilsen, Charles University, Czech Republic

Abstract:
Fluorodeoxyglucose PET/CT (FDG-PET/CT) is routinely used for staging of non-small cell lung cancer (NSCLC), but the follow-up is performed mostly with CT, not allowing functional assessment. Dual-energy CT (DE-CT) scan enables precise quantification of iodine-related parameters that corresponding with tissue perfusion.

Patients (n=45) with clinically confirmed NSCLC stage IIIB and IV, which didn’t qualify for a combination of chemotherapy and radiotherapy were included into the study. FDG-PET/CT including DE-CT was performed in the same setting for staging and early follow-up (2nd cycle of chemotherapy). Our main aim was to directly compare metabolic parameters from PET and iodine parameters calculated from DE-CT with potential relation to the therapy-effect prediction and early follow-up.

A strong correlation was found between volumetric FDG parameters (MTV - metabolic tumour volume and TLG - total lesion glycolysis) and total iodine uptake(mg) using the Spearman correlation coefficient in staging and follow-up (r=0.874, 0.894/0.935, 0.934). We also found significant correlation of change in these values after 2 cycles of therapy. In prediction analysis, we proved significant correlation of iodine uptake, MTV and TLG with outcome and iodine uptake was found as possible strong predictor. The change in iodine concentration after chemotherapy correlated with early therapy effect. In conclusion, our results suggests possible substitutability in functional assessment. Iodine uptake and volume metabolic parameters were found as predictors of early therapy effect and could be used for personal approach in therapy conducting.
Personalized imaging approach to the patient with suspected transthyretin myocardial amyloidosis Authors:

Baxa, J.\(^1\), Hromádka, M.\(^2\), Duršpek, J.\(^2\), Ferda, J.\(^1\)

\(^1\)Department of Imaging Methods, University Hospital in Pilsen, Czech Republic
\(^2\)Department of Cardiology, University Hospital in Pilsen, Czech Republic

Abstract:
Cardiac amyloidosis is severe disorder caused by deposition of abnormal protein (amyloid) in cardiac muscle. Cardiac magnetic resonance (CMR) imaging is the only non-invasive method able to detect myocardial injury and therefore is routine method in suspicion of any myocardial involvement. In patients with myocardial hypertrophy, CMR is routinely used to confirm hypertrophic cardiomyopathy or other etiology according to the late gadolinium enhancement (LGE) pattern. Detection and differentiation between the two most frequent types of cardiac amyloidosis – transthyretin amyloidosis (ATTR) and light chain (AL) - is important considering the therapy and disease development. Bone scintigraphy was proved as efficient tool for confirmation of ATTR amyloidosis.

We performed a retrospective analysis of CMR (2015-2019) and selected patients with non-ischemic LGE corresponding to amyloidosis involvement (48). Amyloidosis was subsequently proved in 31 cases. We tried to distinguish between ATTR (19) and AL amyloidosis (12) according to the pre-defined parameters. We found significantly higher values of septal thickness (20mm vs. 16mm) and LV mass (235g vs. 179g) in ATTR. Subendocardial LGE was dominantly seen in AL (15/19). Higher T1 mapping values were found in AL (1398ms) in comparison to ATTR (1287ms). We also reviewed bone scintigraphy performed with suspicion on amyloidosis, positive bone-tracer scintigraphy correlated with ATTR amyloidosis LGE pattern, however no positive finding was seen in negative CMR patients. Authors recommend CMR in patients with cardiac hypertrophy to detect amyloidosis involvement with possibility to confirm ATTR amyloidosis in combination with bone-tracer scintigraphy.
Belenova, Irina, Doctor of Medical Sciences, Professor

Biography:
Belenova Irina in 1989 was admitted to Voronezh N.N. Burdenko State Medical University. From 1995 to the present time the Assistant Lecturer at the Department of Therapeutic Stomatology of Voronezh N.N. Burdenko State Medical University. In 1998 defended the dissertation for the degree of the Candidate of Medical Sciences in the speciality 14.01.14 – stomatology. In 2005 was admitted for doctoral studies at Voronezh N.N Burdenko State Medical University. Having successfully completed the training in December, 2008, has submitted the dissertation for the scientific degree of the Doctor of Medical Sciences entitled: “Individual prevention of caries in adults”. Up to now has delivered 57 reports at the conferences of different levels, including the central and international, has published 252 papers among them 37 at the international level with more than 361 citations in available literature, H-index 9. Three graduate students defended the dissertation, and five graduate students defended research at the completion stage.

Title:
Prevention of caries before and after treatment

Authors:
Belenova, I.¹, Koretskaya, I.², Shabanov, R.¹, Azarova, O.¹, Belenov, I.¹
¹Department of Hospital Dentistry, Voronezh State Medical University named after N.N. Burdenko
²Department of Propaedeutic Dentistry, Voronezh State Medical University named after N.N. Burdenko, Russian Federation

Abstract:
The primary targets of caries prevention include elimination of different causes and factors for diseases formation and progression as well as increase of the adaptation abilities of men to adverse environmental factors. We believe that an implementation of preventive measures requires an individual approach taking general diseases and dental characteristics of patients into account.
The goal of the research is to increase the efficiency of dental caries prevention in adults by means of creating an individualized caries prevention policy and its putting into practice.
The findings have shown that regular dental check-ups of caries-susceptible patients afford an opportunity to achieve a favourable effect in the course of the preventive actions and a long-term optimal result based on the improvement of patients’ skills in oral hygiene and motivation of their participation in caries prevention programs.

References:
Title:
Prevention of endodontic therapy complications by modification of sealers on epoxy reisin basis

Authors:
Belenova, I.¹, Mitronin, A.², Shumilovich, B.¹, Sushchenko, A.¹, Belenov, I.¹
¹Department of Hospital Dentistry, Voronezh State Medical University named after N.N. Burdenko
²Department of Cariesology and Endodontics, Moscow State University of Medicine and Dentistry named after A.I. Evdokimov
³Institute of Continuing Professional Education, Voronezh State Medical University named after N.N. Burdenko, Russian Federation

Abstract:
This article deals with the issue of prevention of endodontic intervention complications using a sealer modified by electromagnetic field. Efficiency of complication prevention directly depends on the quality of obturation of the system of micro- and macro-canals. It stated that adhesion improvement is possible by modification of the material obturating the system of root canals. It was registered that the influence of an electromagnetic field resulted in increased adhesion, improvement of strength characteristics of polymer materials. We assume that the influence of an electromagnetic field will similarly influence sealers based on polymer compounds.

For our research study we used a device for magnetization providing an electromagnetic impact on an obturation material. After that we investigated changes in the structure of the obturation material determining borders of its adhesion to the tooth root dentine and adhesion strength in the connection of a sealer with walls of the root canal.

Results demonstrated that an electromagnetic field impact led to more ordered arrangement of sealer’s particles, a decreased number and size of pores; the line of demarcation was not defined, adhesive strength increased.

The abovementioned changes provided better obturation resulting in a preventive effect that reduced an incidence of pulpitis and periodontitis complications.

References:
Title:

Prevention a tooth sensitivity after professional teeth whitening

Author:

Belenova, I.1, Mitronin, A.2, Shumilovich, B.3, Sushchenko, A.1, Belenov, I.1

1Department of Hospital Dentistry, Voronezh State Medical University named after N.N. Burdenko
2Department of Cariesology and Endodontics, Moscow State University of Medicine and Dentistry named after A.I. Evdokimov
3Institute of Continuing Professional Education, Voronezh State Medical University named after N.N. Burdenko, Russian Federation

Abstract:
The article is devoted to the issue of professional teeth whitening. Considering changes occurring in the enamel structure and morphology and clinically manifesting by complications, it is demandable to apply reparative techniques and methods aimed at prevention of complications. It is widely known nowadays that dental professionals fail to avoid negative effects of whitening after these procedures, such as de-mineralization and dehydration of tooth tissues, increased discharge of micro- and macro-elements from the enamel surface layer and others.

The aim of study was to investigate de-sensitive properties and clinical efficiency of the remineralizing gel protein-mineral complex. All patients were divided into three equal groups depending on the preparation applied.

Using evidence-based techniques the authors have proved morphological and clinical efficiency of the protein-mineral complex for prevention and prophylaxis after teeth whitening complications.

All recommended preparations applied in the study do not only eliminate increased teeth sensitivity but also provide restoration of mineral exchange in the enamel; this conforms to all parameters of the preparations. However, protein-mineral complex is declared to have the best efficiency in reducing morphological characteristics of the enamel normalizing physiological dental processes after teeth whitening; this fact allows recommending this gel for practical use in clinical conditions.

References:


Boyko, Nadiya, D.Sc., Professor

Biography:
Boyko Nadiya is: 1) Head of the Department of Clinical and Laboratory Diagnostics and Pharmacology, and 2) Director of the RDE Centre of Molecular Microbiology and Mucosal Immunology. She took a PhD degree in 1994 and D.Sc. in 2010. The total work experience in UzhNU is 31 years. From 2000 to 2006 she studied at the doctoral program of UzhNU and was trained as a visiting professor at the University of Pennsylvania, USA. She is the author of about 250 scientific works, including 100 papers in professional scientific journals, more than 50 publications in the pier revived journals, index H=9. Over the past three years, 30 works have been published. Actively and systematically participating in national and international symposiums, conferences, seminars; often with invited papers. She is actively participating in international projects including H2020 (SKIN), and professional experts’ groups (Ministry of Education and Sciences of Ukraine).

Title:
Creation of lactobacilli based Immunobiotics for prevention and treatment of infectious-inflammatory diseases of the human urogenital system

Authors:
Boyko, N.1, Meleshko, T.1, Babenko, L.2, Lazarenko, L.2
1RDE Centre of Molecular Microbiology and Mucosal Immunology, Uzhhorod National University, Uzhhorod, Ukraine
2Department of Problems of Interferon and Immunomodulators, Zabolotny Institute of Microbiology and Virology of NAS of Ukraine, Kyiv, Ukraine

Abstract:
Personalised use of immunobiotics is a promising direction in the prevention of infectious and inflammatory diseases of the genitourinary system in human. Objective of our study was to determine in clinical trials the patient and nosology specific efficacy of immunobiotics, developed from different original strains of lactobacillus, which were selected earlier by using animal and cellular models. Patients with infectious-inflammatory diseases of the genitourinary system were recruited from regional hospital. Eligibility requirements and enrolment procedures were performed in accordance with the EU Regulation No 536/2014. Urinary tract microbiota were plated on chromogenic media, identified with Lachema tests and also were measured by qRT-PCR. Local immune response was determined by ELISA. The typical nosologies of infectious-inflammatory diseases of the genitourinary system were identified and effective new combinations of probiotic strains and/or probiotic compositions were selected, taking into account the individual features of the commensal microbiota. It has been proved that the use of the L. casei IMV B-7412 probiotic strain is most effective in mixed infections classified as significant anaerobic/aerobic microbial ratio disbalances of microbiome, a combination of strains L. casei IMV-B 7280 / L. casei IMV B-7412 enhance the antifungal effect, while the composition of strains L. casei IMV B-7280 and L. acidophilus IMV B-7279 promote the restoration of healthy microbiome, providing complete elimination of coliform bacteria and microscopic fungi, and reducing the number of pathogenic staphylococci. All LAB strains and their compositions were characterized by strain and compositionally specific ability to restore the local and systemic immune response.
Title:
Personalized pharmabiotics for correction of nosology and individual specific microbiota and immune response

Author:
Boyko, N.1, Meleshko, T.1, Rukavchuk, R.1, Drobnych, V.1
1RDE Centre of Molecular Microbiology and Mucosal Immunology, Uzhhorod National University, Uzhhorod, Ukraine
2Ediens, LTD, Uzhhorod, Ukraine

Abstract:
Ideas about the uniqueness of the human microbiome and its decisive role in the health of the population today substantiate the idea of individualization of treatment approaches for patients (patient stratification) and individualized prevention. The latter being the prevention of diseases of the population through the specific implementation of personalized nutrition. Embodied in this is the selection of different biotics (pro-, pre-, syn-, pharma- and immuno-biotics).

Thus, the implementation of individual approaches provides for a personal evaluation of the microbiome functionality and range of its (microbial) metabolites in correlation with other immune and metabolite biomarkers of health. These along with lifestyle assessment and individual behavior and the use of the algorithm to determine personalized nutrition or individual biotics appointment means that the use of biotics should be specific and individual.

We built the information system, to be exact, geographic information system, for personalized recommendations of patient and disease specific pharmabiotics developing and prescriptions aimed to regulate the saliva/gut microbiota ratio, biodiversity and functionality.

Using this system and our databases we designed and clinically probed the efficacy of “ProPhyLactOR”, “DiLactiVAG”, pharmabiotics of new generation.

At the core of both biotics is the initial composition of synergistically selected microorganisms of the normal commensal microbiota and prebiotic ingredients extracted from edible plants. Their composition can be modified slightly and adapted accordingly to the individual patients’ microbiome-immune profile and to detected nosology.

We also previously developed and successfully clinically tested algorithm for personalized nutrition for the treatment of 1) T2D; 2) childhood obesity.
Abstract:
Bio-banking represents a pivotal prerequisite for further developments in personalized medicine. Therefore, building networks represent a crucial element to cooperate. On the European level the “Biobanking and Biomolecular Resources Research Infrastructure – European Research Infrastructure Consortium” (BBMRI-ERIC) is an important network for biobanks in Europe. However, regional biobank-networks could significantly improve the translational and basic research within the connected regions. To enable an optimal collaboration of regional biobanks, web based tools for data exchanges are mandatory to guarantee a long-term success of such a network.

Digital pathology for secondary consultations regarding biobank-specimens could be conducted remotely for accurate tissue diagnosis and the potential use in a research project (i.e. tele-pathology). A student exchange program introduces students from medicine and natural sciences in the biobank idea and the different methods involved in biobanking. Public events explain the need of Biobanking to optimize personalized medicine and to encourage participation.

Our pathology framework enables whole slide Imaging even optimized for small screens. We integrated up to 10 students in our exchange program who were involved in the development of the pathology framework and in the different methods use in the partner sites. Several public events informed highly successful more than 500 people form the public.

The three columns of the BRoATHER project open innovative perspectives to overcome hurdles in biobank cooperations and to optimize specimen quality.
Bubnov, Rostyslav, MD, PhD

Biography:
Rostyslav Bubnov is working as a medical doctor in the clinical hospital ‘Pheophania’ of State Affairs Department, a researcher in the Interferon Department of Zabolotny Institute of Microbiology and Virology, NAS of Ukraine. He is completing administrative responsibilities as National Representative of the European Association for Predictive, Preventive and Personalized Medicine (EPMA) in Ukraine. He received his MD in Horbachevsky Ternopil State Medical University (Ukraine) during the period of 1994-2000, and Ph.D. in Kharkiv Medical Academy of Postgraduate Education during the period of 2009-2012. RVB has integrated extensive expertise in bio/medical fields and healthcare within the concept of Predictive, Preventive and Personalized Medicine with a special focus on pain study, neuro-musculoskeletal imaging, ultrasound, trigger points ultrasound visualization and therapy.

His contributions in microbiome science, nutrition, regenerative medicine and patient profiling are highly influential.

Rostyslav Bubnov is Associate Editor of ‘Body Culture and Sports Medicine’ Section of EPMA Journal (Springer Nature). He is serving as a Member of Editorial Boards and referees in several journals (https://publons.com/author/317326/rostyslav-v-bubnov), he was reviewer of over 160 paper, has over 100 acknowledged reviews of accepted papers in high impact factor journals.

Rostyslav Bubnov has authored and co-authored over 300 papers, including over 50 in high impact factor journals, Position papers, a number of highly accessed and cited papers, etc. – see:
https://www.scopus.com/authid/detail.uri?authorId=38360919800
https://www.researchgate.net/profile/Rostyslav_Bubnov/
https://scholar.google.com.ua/citations?user=k9YfXKwAAAAJ

Email: dr.rbubnov@gmail.com
Title:

Individualized probiotic therapy of metabolic syndrome – preliminary clinical results

Authors:

Bubnov, R.1,2, Spivak, M.1

1Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine, Zabolotny Str., 154, Kyiv, 03143 Ukraine
2Clinical Hospital "Pheophania" of State Affairs Department, Zabolotny Str., 21, Kyiv, 03143 Ukraine

Abstract:

Introduction:
Definition of metabolic syndrome (MetS) requires detection of central obesity + 2/4 factos (hyperglycemia, dyslipidemia, cardiovascular disease, hypertension). Ultrasound (US) can accurately detect visceral obesity and number of markers to for stratification of patients with MetS.

Aim:
The aim was to study efficacy of individualized probiotic therapy of MetS according to the host’s phenotype using multiparameter ultrasound markers.

Material and methods:
We included 116 overweight subjects (age 23-74 years; 67 females), BMI>30, waist circumference (WC)>110, or constituents of MetS and normal / low BMI, who underwent general clinical, lab tests; radiology tests for stratification according to developed MetS biomarker panel, which included:

- Anthropometric (weight, BMI, WC);
- Metabolic markers (NAFLD liver size and stiffness) portal hypertension;
- Pro-inflammatory (visceral fat (VF), microsplenia, intestinal wall thickness);
- Vascular (mesenteric, renal blood flow Doppler), atherosclerosis plaques;
- Hypoxia markers;
- Microbiota markers;
- ‘Mechanistical’ – posture parameters, muscle signaling, trigger points, nerves.

After careful examination we selected 10 patients for probiotic therapy with patterns of MetS as follows: DMT2; liver fibrosis, NAFLD; hyperuricemia, gout; atherosclerosis; hypertension (early age); and 3 patients with normal / low BMI with detected increased VF. Probiotic strains were selectively given according to [1,2]: at a dose 10^8 CFU daily during 10 days: L. acidophilus IMV В-7279, L. casei IMV B-7280, L. delbrueckii subsp. bulgaricus IMV B-7281, L. rhamnosus LB-3 VK6, L. delbrueckii LE VK8, L. plantarum LM VK7), Bifidobacterium genus (B. animalis VKL, B. animalis VKB.

Results:
Weight, BMI, WC and VF decreased after probiotic administration. All studied parameters improved in all cases - US markers of visceral obesity, gut motility, colonic wall thickness, liver size and stiffness, mesenteric lymph nodes, spleen size and Doppler markers of mesenteric blood flow.

Conclusion:
Short-term probiotic therapy is effective for various metabolic disorders in obese and lean individuals if prescribed individualized.
Fig. 1. Positive progress of liver (left) and visceral fat (right) structure and stiffness (upper – after therapy).

References:
Title:

Myofascial trigger points as potentially underestimated hypoxic niches – considerations towards specific phenotype, patient stratification, preventive and personalized treatments

Authors:

Bubnov, R.1,2, Golubnitschaja, O.3,4,5

1Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine, Zabolotny Str., 154, Kyiv, 03143 Ukraine
2Clinical Hospital "Pheophania" of State Affairs Department, Zabolotny Str., 21, Kyiv, 03143 Ukraine
3Radiological clinic, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
4Breast Cancer Research Centre, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
5Centre for Integrated Oncology, Cologne-Bonn, Rheinische Friedrich-Wilhelms-University of Bonn, Germany

Abstract:

Objectives:

Myofascial trigger point (MTrP) is a pillar pathophysiological unit in development of myofascial pain and postural imbalance [1]. Dry needling (DN) of MTrP under ultrasound (US) guidance is prioritized method for treatment myofascial pain.

Hypothesis: MTrP are spastic, low energy and/or ischaemic areas that can contribute to systemic hypoxic niches, for example associated with Flammer syndrome phenotype [2,3].

The aim was to evaluate structure of MTrP in regard to stiffness and “ischaemic pattern” before and after DN.

Methods:

We included 40 patients (26 females, aged 18–68 y.o.) with low back pain. Healthy 20 individuals (aged 18–52 y.o.) were controls. All patients underwent general exam, MRI, precise physical tests, extensive functional multiparameter neuromuscular US including M-mode, elastography (SWE), B-Flow (LOGIC E9 GE) of multifidus muscles. Then patients received DN of detected MTrP under US guidance.

Results:

We clearly detected MTrP as hypoechoic, stiff and hypovascular small areas with different patterns of decreasing motility, contractility (muscle contracted/rested thickness) in all patients examined; precise DN was performed. After the DN application, muscle structure improved, motility and contractility restored, VAS scores changed from 7.4 to 2.3 (p <0.05). SWE was 11±6 kPa in MTrP (27 kPa in active, 5-8 kPa in latent MTrP) vs 3.8±0.3 kPa in controls and decreased to 4±0.4 kPa after treatment. The size of ischaemic patterns decreased from 3-4 mm to 0-1.5 mm, correlated with an improved muscle function. The pilot study demonstrated MTrP, more expressed ischaemic patterns, higher sensitivity and retaining levels as more prevalent in individuals with low BMI.

Conclusions and Expert recommendations:

MTrP are stiff and likely hypoxic areas, the parameters of which improved after precise DN applied. Based on the preliminary results, US hunting for ischemic patterns is proposed to advance the patient stratification, targeted prevention and treatments tailored to the individual patient profiles.
For the follow-up studies a correlation of the Flammer syndrome phenotype with individualised profiles of patients and diagnosed ischaemic patterns is recommended.

References:
Desiderio, Dominic M., Ph.D., Professor Emeritus

Biography:
Dominic M. Desiderio received his undergraduate training at the University of Pittsburgh, and his graduate training at the Massachusetts Institute of Technology with Klaus Biemann. After two years at American Cyanamid in Stamford, Connecticut, he spent 11 years at the Baylor College of Medicine Institute for Lipid Research, where he achieved the rank of Associate Professor. In 1978, he moved to the University of Tennessee Health Science Center, where he was a Professor of Neurology (Chemistry) in the Department of Neurology, Professor of Molecular Sciences in the Department of Molecular Sciences, and Director of the Charles B. Stout Neuroscience Mass Spectrometry Laboratory. He is now a Professor Emeritus. His main area of research focuses on basic molecular mechanisms involved in several different human pathologies; in particular, pituitary adenomas. Currently, he uses proteomics methodology to analyze differentially expressed proteins, phosphoproteins, and nitroproteins in human tissues and fluids. Other areas of research include qualitative and quantitative analytical measurements of neuropeptides in tissues and fluids. He is an editor of the Wiley journal Mass Spectrometry Reviews, and a co-editor of the Wiley Book-Series on Mass Spectrometry.

Title:
Ubiquitinated Proteins in the Human Pituitary and Pituitary Adenomas

Authors:
Desiderio, D.¹, Zhan, X.²

¹Department of Neurology, University of Tennessee Health Sciences Center, Memphis, TN, USA
²State Local Joint Engineering Laboratory for Anticancer Drugs, Hunan Engineering Laboratory for Structural Biology and Drug Design, Key Laboratory of Cancer Proteomics of Chinese Ministry of Health, Xiangya Hospital, Central South University, Changsha, Hunan, P.R. China

Abstract:
We analyzed 5 human pituitary pituitaries and 8 clinically non-functional pituitary adenomas (NFPA) for ubiquitinated proteins. An anti-ubiquitinated Ab-based label-free quantitative proteomics system was used (Quantitative analysis of ubiquitinated proteins in human pituitary and pituitary adenoma tissues. Qian, Zhan, Lu, Li, Long, Li, Long, Li, Desiderio, Zhan. Frontiers in Endocrinology-Pituitary Endocrinology, vol. 10, article 328, 2019). After trypsin treatment, an Ab to K-e-GG, which is the moiety linked to tryptic peptides, was used to detect ubiquitinated peptides. LC-MS/MS, Q-Exactive MS, High-energy CAD, and GO analysis were used. We found 108 ubiquitinated proteins, 158 ubiquitinated sites, 142 ubiquitinated peptides, and 5 ubiquitinated motifs. The ubiquitination profile ranged from 8 to 29 amino acid peptide length and up to 17 peptides maximum at the decapeptide length. Four signaling pathways were found in which ubiquitinated proteins occurred: PI3K0Akt, Hippo, Ribosome, and Nucleotide excision repair. The 5 motifs were: K*-X2-E, D-X4-K*, K-X4-K*, K-X3-K*, and K*A (K* = ubiquitinated lysine residue. X = any amino acid residue.). The 14-3-3 protein was important in the PI3K-AKT and Hippo signaling pathways. 14-3-3 was lower in control compared to NFPA tissue. 14-3-3 underwent ubiquitination in control but not NFPA tissue. This research program is part of our continuing study to elucidate molecular events that might contribute to the formation of human pituitary adenomas.
Duffy, Joe, Ph.D., Professor

Biography:
Biography Professor Duffy who is based at St Vincent’s University Hospital, Dublin and University College, Dublin has an international reputation for his research in cancer biomarkers. He has published in excess of 250 papers on this topic, including articles in high impact journals such as Lancet, BMJ, J Natl Cancer Inst, Cancer Res, Clin Cancer Res, Ann Oncol and Clin Chem. His work has been cited > 16,000 times and his current h-index is 71.

In 2012, Professor Duffy was the recipient of the 2012 Abbott Award of the International Society of Oncology and BioMarkers (ISOBM). This award is made annually to investigators, world-wide, who have made an outstanding contribution in the field of basic or clinical oncology research. Other awards received by Professor Duffy include the St Luke’s Medal Lecture, the Conway Review Medal Lecture and the Lifetime Achievement Award of the Royal Academy of Medicine in Ireland and the National Committee for Biochemistry Award Medal Lecture of the Royal Irish Academy.

Title:
Biomarkers: The Key to Personalised Treatment for Cancer

Authors:
Duffy, M. J.
Clinical Research Centre, St Vincent’s University Hospital, Dublin and School of Medicine, University College Dublin, Dublin.

Abstract:
Personalized treatment can be defined as using the biological characteristics of a patient's disease in order to administer the most effective therapy at the optimum dose. To provide personalised treatment for cancer, 4 main types of biomarkers are necessary. These include prognostic biomarkers to identify who should or should not receive adjuvant treatment, predictive biomarkers to identify the most appropriate therapy, toxicity biomarkers to identify potential severe toxicity and monitoring biomarkers to assess real-time response to treatment. Validated prognostic biomarkers include uPA, Oncotype DX and MammaPrint for lymph node-negative breast cancer, MSI for stage II colon cancer and AFP, HCG and LDH for advanced germ cell tumors. Every day used predictive biomarkers include ER and HER2 for endocrine and anti-HER2 therapy, respectively in breast cancer, mutation status of BRAF for anti-BRAF therapy in melanoma, KRAS/NRAS mutation status for anti-EGFR antibodies in colorectal cancer and EGFR mutational status for anti-EGFR TKIs in non-small cell lung cancer. Currently available predictive biomarkers for immunotherapy include MSI, PD-L1 levels and tumor mutational burden. For upfront identification of patients at high risk of suffering from severe therapy-related toxicity in colorectal cancer, specific variants of dihydropyrimidine dehydrogenase (DPD) may be measured for predicting toxicity from fluoropyrimidines and uridine diphosphate glucuronosyltransferase*28 (UGT1A1*28) for predicting toxicity from irinotecan. Therapy monitoring biomarkers include CEA for colorectal cancer, PSA for prostate cancer, CA 125 for ovarian cancer and CA 15-3, CEA, TPA and TPS for breast cancer. The use of prognostic, predictive, toxicity and monitoring biomarkers can thus help match each patient to the most effective and least toxic therapy and as a result avoid useless toxicity and unnecessary costs.
Personalized treatment can be defined as using the biological characteristics of a patient's disease in the selection of treatment. Toxic therapy and as a result avoid useless toxicity and unnecessary costs. Toxicity and monitoring biomarkers can thus help match each patient to the most effective and least toxic therapy. Therapy monitoring biomarkers include CEA for colorectal cancer, PSA for prostate cancer, CA 125 for ovarian cancer and CA 15 for lung cancer. Currently available predictive biomarkers for immunotherapy include MSI, PD-L1 and PD-1 expression, and mutational status of BRAF for anti-EGFR TKIs in non-small cell lung cancer. The use of prognostic, predictive, and neuroimmune biomarkers can predict the most appropriate therapy, toxicity biomarkers to identify potential severe toxicity and biomarkers to assess real-time response to treatment. Validated prognostic biomarkers include uPA, Oncotype DX and MammaPrint for lymph node burden. For upfront identification of patients at high risk of suffering from toxic treatment at the Department of neurology and neurosurgery of Stavropol state medical University. Nowadays, he works as doctor of endovascular methods of diagnosis and treatment at the Department of endovascular methods of diagnostics and treatment of the Stavropol Regional Clinical hospital. Since 2011, he has been studying markers of brain damage in aneurysmal subarachnoid hemorrhage. He is an author of more than 20 articles in medical journals.

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Title:

Neuroimmune predictors of aneurysmal subarachnoid hemorrhage outcome

Authors:

Ermakov, Sergey V.

1Stavropol State Medical University, Russia

2Stavropol Regional Clinical hospital, Stavropol, Russia

Abstract:

The aim of the study was to determine the possibility of predicting the course and outcomes of aSAH using the determination of the level of autoantibodies to neurospecific proteins. The level of autoantibodies to neurospecific proteins (NSP) was determined in 65 patients: 35 with diagnosis of aSAH and 30 healthy volunteers (under 35 years). Enzyme immunoassay was used to determine autoantibodies (auto-AB) to the main myelin protein (MMP), peripheral myelin, dopamine receptors, myosin, N-methyl-D-aspartate (NMDA receptors), and S-100 protein in blood plasma. All patients underwent determination of the severity of illness at admission and in dynamics using scales: Hunt-Hess, Graeb, Rivermead mobility index and others. Statistical processing was performed in the program Statistica 10.0.

Results and discussion: the first stage of the study identified NSP, characterized by a large increase in the titer of auto-AB. Further, during the analysis of the obtained data, a statistically significant correlation between the titers of autoantibodies to S100 protein (Δ=360.43±40.35 µg/ml, p<0.05), MMB (Δ=145.91±12.43 µg/ml, p<0.05), NMDA receptors (Δ=66.17±6.42 µg/ml, p<0.05) and aSAH outcome was established.

Conclusions: a high titer of antibodies to protein S-100, NMDA-receptors, MMP is associated with the severity of aSAH, and higher titers of auto-antibody to NSP first 96 hours from the debut of aSAH are a predictor of development of clinically significant cerebral vasospasm; determination of the titer of autoantibodies to neurospecific proteins in acute aSAH allows to predict the outcome of treatment.
Everaus, Hele, Professor

Biography:
Professor of hematology/oncoology(emeritus); Member of Estonian Parliament. Hele Everaus has leded several reforms in hematology-oncology in Estonia: organized the research laboratory, created bone marrow transplantation facility in Tartu University Hospital and performed first bone marrow transplantation in 1993 (first in Baltic countries). She has been leading Estonian National Blood Transfusion Committee for several years and introduced the reform of blood transfusion service in Estonia. She served as an expert to Council of Europe (immune-hematology and blood transfusion and bioethics). In 2013 European Group of Blood and Marrow Transplantation has recognized professor Hele Everaus with the ‘EBMT Clinical Service Award in recognition of an outstanding life-time achievement in bone marrow transplantation’ and named her as honorary member. Hele Everaus has been leading hematology-oncology clinic for 16 years. Under her supervision Tartu University Hospital has passed successfully the accreditation of the European Association of Cancer Institutes. During five-year period on vice rector position in Tartu University prof Everaus has created several innovations, as a new Institute of Technology, joining of Marine Institute with the University of Tartu etc. From 15 000 candidates professor Everaus has been elected as the member of Advisory Group for the new EU research and innovation programme ‘Horizon 2020’. From April 2019 Hele Everaus is serving as the member of Estonian parliament.
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Title:
Systems Medicine Approach for Individualized Management of Cancer - a Novel Way for the Progress?

Author:
Everaus, H.
Tartu University, Tartu University Hospital, hematology-oncology professor emeritus

Abstract:
Despite success of genome-wide association studies, the underlying pathophysiological mechanisms of malignancies remain – to be determined.
A disease is rarely a simple consequence of an abnormal single effector but, rather is a reflection of pathobiological processes interacting in a complex network. To provide a more comprehensive picture, the systems medicine approach including molecular findings of regulatory RNAs and DNA ,proteins ,metabolites and the knowledge of cell biology and human phenotypic and clinical data ,is needed.
While neoplasia takes many forms, the relationship between an individual tumor, microenvironment and immune system is clearly a complex and little understood topic.
Wether the management of malignancies will become more personal, depends very much on our ability to integrate and interpret patient’s complex heterogeneous data sets through the systems medicine approaches.
Evseyeva, Maria E., MD., PhD, Professor

Biography:
Maria E. Evseyeva, Prof.MD., PhD, Honoured Physician of Russian Federation, Head of the Department of Internal Medicine «Faculty Therapy» of Stavropol State Medical University (StSMU) and Head of the Health Center of StSMU, Member of the European Association of Preventive Cardiology, The American Academy Of Anti-Aging Medicine, International Society of Hypertension and American Society of Preventive Cardiology. 310 Mira St., Stavropol, Russian Federation 355017

Prof.MD. Maria E. Evseyeva have graduated Stavropol State Medical University with honors, then studied at clinical residency and postgraduate at the departments of internal diseases at the same University. She defended his candidate and doctoral dissertations on clinical and experimental material in the subject of cardioprotection from ischemic, stress and noncoronary myocardial damages at the Institute of General Pathology of Russian Academy of Sciences (Moscow). In recent years she directs the work of the research group on the problem of approaches to predictive complex diagnostics of the syndrome of early vascular aging and its personalized prevention in different groups of young people, taking into account a variety of risk factors and the environment. She has more than 300 publications, about 50 of which in International Journals, such as the Circulation, Journal of Hypertension, European Journal on Preventive Cardiology, Clinical Cardiology, Journal of Predictive, Preventive and Personalized Medicine and others. She regularly submitted the results of their research at International and National congresses. She is the recipient of numerous Honorary Diplomas of The Ministry of Health of the Russian Federation and The Russian Academy of Sciences. Her research team won several government grants for research, and her graduate students won Presidential scholarships. She has also been awarded Honorary Publishing Mark by the American Society of Preventive Cardiology and Paul White International Scientific Prize by The American Heart Association.

Email: evsevieva@mail.ru

Title:
Flummer's syndrome and pregnancy in terms of neonatal development and vascular status of pregnant women

Authors:
Evseyeva, M., Sergeeva, O., Stchetinin, E., Golubnitschaja, O.
Stavropol State Medical University, Russian Federation, Stavropol

Abstract:

Background:
The problem of Flummer's syndrome (FS) is intensively discussed in modern literature in various aspects, including the peculiarities of pregnancy. It is known, for example, that this syndrome may have manifestation during pregnancy in the form of oligohydramnios. FS corresponds to phenotype, characterized by presence of primary vascular dysregulation, which, perhaps, determines intrauterine conditions of fetal development.
Objective:
To study some indicators of the trophic status of newborns and vascular status of their mothers, taking into account presence of FS signs.

Material and methods:
45 pregnant women (mean age 28.4±2.3) were under observation. The main group consisted of pregnant women with diagnosed SF by using specialized questionnaire (O. Golubnitschaja, J. Flammer, 2018) (21); comparison group included women (24) without FS. Vascular rigidity indices in each trimester, growth-weight parameters of the newborn (Quetelet I index) and delivery term were evaluated. The data is processed using MS Excel statistical software package (2010).

Results:
Newborns from mothers with FS were characterized by significantly lower weight (3169±296 and 3620±363 g), height (50.8±1.51 and 53±1.6 cm) and gestational age (38.4±0.81 and 39.5±0.53). Trophic status of newborns, reflecting state of nutrition in intrauterine period, differed markedly in the group with FS compared with control - hypotrophy was detected significantly more often (40% and 5.5%), normotrophy - less frequently (53.4% and 72.2%) and hypertrophy – significantly less frequently (6.6% and 22.7%). Two groups differed in terms of vascular stiffness towards its increase in the main group. Significant differences were obtained for peripheral augmentation index AIx75 in first trimester (-45% and -61%, respectively).

Conclusion:
The presence of FS signs in pregnant women is associated with changes in both maternal vascular status and trophic parameters of the newborn. The data indicate the expediency of taking into account signs of FS in pregnant women for purpose of predictive diagnosis of fetal abnormalities to develop optimal approaches to the timely correction of these deviations.

Title:
The syndrome of early vascular aging and health protection system of youth

Authors:
Stavropol State Medical University, Russian Federation, Stavropol

Abstract:

Background:
It is shown that in modern life conditions atherosclerosis is rapidly getting younger. Therefore, it is necessary to study possibilities of new diagnostic technologies for early diagnosis of cases of premature vascular aging at stage of absence of any clinical manifestations.

Purpose:
To compare the possibilities of traditional risk scales for assessment of cardiovascular (CV) risk in young people in comparison with results of instrumental determination of their vascular age.

Materials:
It was evaluated risk factors (RF) profile of 224 students. The device VaSera-1500 (Fukuda Denshi, Japan) was used, which allows to estimate Cardio-Angle Vascular Index (CAVI). Device also gives conclusion about vascular age, which allows to identify EVA-syndrome (early vascular aging). Groups
were formed by CAVI-quartiles. Data were processed using software package "Statistica 10.0" (StatSoft Inc, USA).

Results:
It was found that among students who fell into upper CAVI-quartile group there were 19 boys out of 81 (23.4%) and 38 girls out of 162 (23.5%). Almost half of them were also characterized by presence of EVA-syndrome. According to results of use of three risk scales, the vast majority of representatives of upper CAVI-quartile differed in low CV risk, that is, they should not have been included in the dispensary risk group.

Conclusion:
Among students, every fourth belongs to group of upper CAVI-quartile, and some of them have signs of EVA-syndrome. Since traditional risk scales are not able to adequately assess CV risk of young people, it is necessary to use angiological screening in process of preventive measures.

Title:
Vascular remodeling in young people, taking into account various forms of focal infection

Authors:
Evseyeva, M. E., Eremin, M. V., Italyantseva, E. V., Koshel, V. I., Baturin V. A.
Stavropol State Medical University, Russian Federation, Stavropol

Abstract:
Background:
The role of the infectious process as a possible risk factor for atherosclerosis development is being discussed more intensively. However, significance of focal chronic infection (FCI) of upper respiratory tract in this aspect has not been yet studied.

Aim:
Aim - to determine features of vascular status in young people with different variants of chronic tonsillitis (CT).

Materials:
It was assessed augmentation index of aorta (Alxao), peripheral augmentation index (Alx), pulse pressure amplification (PPA) and other vascular indicators with help of diagnostic complex Vasotens BPLab (Peter Telegin, Russia) in 79 young men with various forms of FCI. Examined persons were divided into three groups: 1st group – without any FCI (22); 2nd group - with decompensated CT (25); 3rd group – with compensated CT (21). The results were processed using software package "Statistica 10" (StatSoft Inc).

Results:
It turned out that in 1st and 2nd groups indicator Alx has made -50,78±1,93% and -44,71±1,13%, and Alxao equaled -0,87±0.08% and 2.31±0,11% (P1-2= 0,03). While in the 3rd group, these options amounted to -46,61±2.09% and 1,17±0,15 (P1-3= 0,04).

Conclusion:
The data indicate increase of arterial rigidity in young people in the presence of FCI. And the degree of such violations depends on the severity of this infection. In such case particularly affected aortic wall. These data allow us to consider FCI as risk factor for atherogenesis. Moreover, FCI should be attributed to the category of modifiable risk factors, which opens up additional opportunities for prevention of atherogenesis in early stage of its development.
Ferda, Jiří, M.D., Ph.D., Professor

Biography:

**Education:** Faculty of Medicine Plzeň, Charles University, CZ (1994), Board Certificate in Radiology, Neuroradiology, Vascular Interventional Radiology, Nuclear Medicine, Professor of Radiology (2013)

**Present Appointment:** Vice-chair of Department of the Imaging (since 2009), Vice-dean for education of General Medicine (since 2018), University Hospital Plzeň and Faculty of Medicine, Charles University

**Topics of interest:** Cardiovascular imaging, Neuroimaging, Imaging in Oncology, Molecular imaging and Hybrid Imaging.

**Important memberships/positions:** Czech Radiological Society – chairman, Accreditation committee of Czech Health Ministry for Radiology (vice-chairman) and Nuclear Medicine (member), Czech Radiology Journal - editor-in-chief, European Journal of Radiology – section head editor of hybrid imaging

**Publications** - textbooks: 6, Chapters in textbooks 8, articles 328, citations by Web of Science 711, h-index by WOS 16, citations by Scopus 929, h-index by Scopus 16

Title:

**Newly diagnosed prostate carcinoma: a contribution of 68Ga-PSMA-PET/MRI in personalized therapy decisions making**

**Authors:**

Ferda, J.¹, Ferdová, E.¹, Baxa, J.¹, Hora, M.², Sedláčková, H.², Hes, O.³, Topolčan, O.⁴, Kučera, R.⁴

¹Department of the Imaging Methods

²Department of Urology

³Šikl’s Institute of the Pathological Anatomy

⁴Division of the Immunochemical Diagnostic

**Abstract:**

**Purpose:**

To evaluate the contribution of 68Ga-PSMA - PET/MRI in the process of the personalized therapy decision making at the start point of confirmed diagnosis of prostatic carcinoma

**Materials and method:**

60 male patients with newly diagnosed prostatic carcinoma (age 50 — 73, mean age 67,5) were investigated using 68Ga-PSMA -11-PET/MRI. The examination was performed after intravenous application of 1.15MBq/kg of 68Ga-PSMA-11 including full diagnostic prostate MRI. The personalized decision in therapy selection according PET/MRI finding, the prostatic biomarkers and patient’s preference were as followed – radical prostatectomy, oncological treatment including teleradiotherapy, or watch and wait. The Study was approved by the local ethic committee and national State Department of Drugs Control and has EuDra registration.
Results:
There were performed 25 radical prostatectomies in patients without distant metastases and without local advanced disease; the oncological treatment was used in 13 patients including 11 with distant metastases detected by PET/MRI and two patients who preferred radiotherapy over surgery, in two patients with limited disease was decided to use watch and wait approach.

Conclusion:
The imaging with 68GaPSMA-11-PET/MRI is being able to offer the possibility to be used the qualified individualized decision making according the state of disease and the self-preference of the patient.

Title:
A contribution of 18F-FDG-PET/MRI to the personalized therapy in newly diagnosed breast carcinoma

Authors:
Ferda, J.¹, Ferdová, E.¹, Baxa, J.¹, Fínek, J.², Hes, O.³, Topolčan, O.³, Kučera, R.³
¹Department of the Imaging Methods
²Department of Oncology and Radiotherapy
³Šikl’s Institute of the Pathological Anatomy

Abstract:

Purpose:
To evaluate the role of 18F-PET/MRI in the staging of the breast carcinoma and its involvement in therapy decision making

Materials and method:
100 women (age 23-72, mean age 53,9) underwent the staging of the breast carcinoma using 18F-FDG PET/MRI. The examination was performed after intravenous application of 2.5 MBq/kg of 18F-FDG. PET/MRI examination consist of targeted breast imaging in prone position using dedicated 4-channel breast coil including the dynamic Gd-enhanced study after application of gadobutrol in the dose of 0.1 mmol/kg. The finding of PET/MRI was compared with the histological evaluation and the decision making about therapy was made based of clinical, imaging and histopathological data by the multidisciplinary team.

Results:
Based on PET/MRI finding were found distant metastases in 13 patients, in whom the systemic therapy was used, the neoadjuvant therapy before surgery was used in 31 patients, the direct involvement to the therapy decision was present in other eleven patients due to the finding of multiple tumors, axillary glandular carcinoma or finding of the previously occult tumor.

Conclusion:
18F-FDG-PET/MRI could involve the personalized treatment in more than half of all patients with newly detected breast carcinoma
Title:
A role of 18F-FDG-PET/CT in detection of the cause of the sepsis and its impact on treatment decision making

Authors:
Ferda, J., Ferdová, E., Baxa, J., Matějovič, M., Beneš, J.

1Department of the Imaging Methods
2Department of Internal Medicine
3Department of the Anaesthesiology, Resuscitation and Intensive Medicine

Abstract:

Purpose:
To evaluate a diagnostic value of the PET/CT in detection of cause of the septic state in patients and its value to the patient management

Material and method:
There were performed whole-body 18F-FDG-PET/CT examinations in 50 consecutive patients (the age 23-79 years, 23 females, 37 males) suffered from sepsis or bacteremia with systemic response, and the cause was remained unclear after routine examinations. PET data acquisition took 1,5, minutes in each position. The imaging findings were compared with microbiology investigations or histological assessments

Results:
The cause of the septic state was found in 88 %. There were found 21 cases of musculoskeletal infections including spondylodiscitis. In 12 patients, the infection of the cardiovascular system was found including endocarditis, infection of the implanted devices or bypass-graft. Other eight patients, the other causes of the septic state were determined. In three patients, the malignant disease was found. The cause of septic state remained undetected in 6 patients. The results of imaging trigger therapy in 44 patients.

Conclusion:
18F-FDG-PET/CT is able to play an important role in detection of the cause of septic state in patients and in the therapy decisions, especially in the detection of hidden musculoskeletal and cardiovascular infections.
Title:

Personalized imaging approach to the patient with suspected Alzheimer disease using brain PET/MRI

Authors:
Ferda, J., Ferdová, E., Baxa, J.
Department of the Imaging Methods

Abstract:

Purpose:
To evaluate a value of the brain PET/MR in the differential diagnosis of cognitive impairment suspected from Alzheimer disease (AD) using 18F-labeled amyloid-beta specific radiopharmaceuticals (FAB)

Material and method:
There were performed brain PET/MRI in fifty patients with suspected AD. FAB (flutemetamol or florbetaben) was used in the early-phase (15 min delay) and late phase (90 min delay). There were assessed the accumulation of FAB within the gray matter of the frontal lobes, dorsal cingulate, parietal lobes and precuneus and in basal ganglia. Those accumulations were assigned as related to AD. The early-perfusion related PET images and full diagnostic MR images were also assessed.

Results:
31 patients had the pathological FAB related to AD. The other diagnoses without amyloid beta gray matter accumulation and with specific MRI were also found – dementia of the vascular origin (in 8 patients), one with meningioma and one patient with typical MRI finding of supranuclear palsy, in five patients, no specific finding was found. The typical frontal loss of accumulation in the early phase of distribution in 4 patients

Conclusion:
Because of need individualized patient care with different causes of the cognitive impairment, FAB-PET/MR could better stratify the patients according their probable diagnoses.
Fiala, Ondřej, M.D., Ph.D., Associate Professor

Biography:
Ondřej Fiala graduated from the Faculty of Medicine in Pilsen, Charles University. He works as a clinical oncologist at Department of Oncology and Radiotherapy, University Hospital in Pilsen and also as a teacher and researcher in the Biomedical Center and Faculty of Medicine in Pilsen. He mainly focuses on colorectal cancer, urological malignancies and lung cancer, particularly on the role of prognostic and predictive biomarkers in patients treated with targeted agents. He received several scientific awards and published 47 research articles in journals with IF and several chapters in medical books, H-index: 10.

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Title:
Predictive role of primary tumour sidedness in patients with metastatic colorectal cancer treated with anti-EGFR monoclonal antibodies or bevacizumab in the first line

Authors:
Fiala, O. 1,2, Ostanov, P. 2, Hosek, P. 2, Sorejs, O. 1,2, Liska, V. 2,3, Buchler, T. 4, Poprach, A. 5, Kucera, R. 6, Topolcan, O. 6, Sustr, J. 1, Sedivcova, M. 7, Finek, J. 1
1Department of Oncology and Radiotherapy, Medical School and University Hospital in Pilsen, Charles University, Czech Republic
2Biomedical Center, Faculty of Medicine in Pilsen, Charles University, Czech Republic
3Department of Surgery, Medical School and University Hospital in Pilsen, Charles University, Czech Republic
4Department of Oncology, First Faculty of Medicine, Charles University and Thomayer Hospital, Czech Republic
5Department of Comprehensive Cancer Care and Faculty of Medicine, Masaryk Memorial Cancer Institute and Masaryk University, Zluty kopec 543/7, 656 53 Brno, Czech Republic
6Department of Immunochemistry, Medical School and University Hospital in Pilsen, Charles University, Czech Republic
7Bioptic Laboratory, Ltd., Molecular Pathology Laboratory, Pilsen, Czech Republic

Abstract:
Monoclonal antibodies (mAbs) against vascular endothelial growth factor (VEGF), bevacizumab and mAbs against epidermal growth factor receptor (EGFR), cetuximab and panitumumab are widely used in the treatment of metastatic colorectal cancer (mCRC). However, optimal selection of first-line targeted treatment for wild-type RAS mCRC remains unclear. The aim of our study was to assess predictive role of the primary tumour sidedness (PTS) in patients with wild-type RAS mCRC treated...
with first-line targeted agents and to compare two therapy approaches: anti-EGFR mAbs for left-sided CRC (L-CRC) and bevacizumab for right-sided CRC (R-CRC) vs. the reverse combination. The cohort included 178 mCRC patients treated with first-line anti-EGFR mAbs or bevacizumab. We observed longer PFS and OS for patients with L-CRC compared to those with R-CRC treated with anti-EGFR mAbs (p=0.0033 and p=0.0037), while the difference in survival between L-CRC and R-CRC in patients treated with bevacizumab was not significant. The median PFS and OS for patients with L-CRC treated with anti-EGFR mAbs and those with R-CRC treated with bevacizumab was 12.16 and 33.15 vs. 7.92 and 23.59 months for patients treated with the reverse combination (p=0.0002 and p=0.011). In conclusion, our study suggests that PTS is a predictive factor for anti-EGFR mAbs, but not for bevacizumab in the first-line treatment of wild-type RAS mCRC and show superior results for anti-EGFR mAbs for L-CRC and bevacizumab for R-CRC as compared to the reverse combination.
Fichtl, Jakub, M.D., Ph.D.

Biography:
After the birth in Pilsen in 1984, he graduated from Charles University, Faculty of Medicine in Pilsen in 2009, he started working at the Department of Surgery in the same year. He has been working there since and currently he is also working as a teacher of general surgery for medical students. He gradually obtained assessments in general surgery in 2015. His main specialization is surgical oncology, especially liver surgery. In 2016 he retained postgradual study on the theme: Liver regeneration with stemm cells. He is the author of 48 publications and multiple lectures for medical students and expert society. His H-index is 5. Except for his job he devotes to family and sport.

Title:
Treatment of colorectal liver and pulmonary metastases – single centre experience.

Authors:
Fichtl, J.¹, Třeška, V.¹, Vodička, J.¹, Špidlen, V.¹, Liška, V.¹, Duras, P.², Topolčan, O.³
¹Department of Surgery; ²Department of Radiology; ³Department of Immunochemistry Diagnostics;
Charles University, Faculty of Medicine in Pilsen, Faculty Hospital Pilsen, Czech Republic

Abstract:
Introduction:
In the Czech Republic, Colorectal carcinoma is a serious socioeconomical problem. The most frequent cause of death is a generalization to liver and lungs. The single liver or pulmonary resection for colorectal metastases is nowadays unequivocal trend. But in our department, we have proceeded even further in the treatment, and we would like to introduce an unique cohort of patients who underwent both, liver and pulmonary resection.

Methods:
We evaluated the cohort of 43 patients, who were operated on between 2002 and 2018. These patients underwent 117 operations altogether in combination of liver and pulmonary resections. We evaluated a relationship between overall survival (OS) or disease free survival and age of patients, number and order of resections, systemic treatment etc.

Results:
There were 62 liver and 54 pulmonary resections from 117 operations. The average age was 63,5 years. Male were dominant (28-65,1%). Statistically better OS was in patients over 65 years old. 17 patients died in average of 4,7 years after the primary operation. Concurrently more than 60 percent of patients are still alive in average 7,4 years from the primary operation. In two-thirds of patients liver resection had preceded pulmunary resection. Systemic treatment was given to 79 % of patients. The only statistic significant from tumor markers was the value of CA19-9 prior to the primary operation.

Conclusion:
Our cohort obviously shows, that in strictly selective cases, the surgical resection of limited generalization, has its place in the contemporary treatment of advanced stage colorectal carcinoma.
Our cohort obviously shows, that in strictly selective cases, the surgical resection of liver resection had preceded pulmunary resection. Systemic treatment was given to 79 of patients are still alive in average 7.4 years from the primary operation. In two patients died in average of 4.7 years after the primary operation. Conclusion:

The only statistic significant from tumor markers was the value of CA19-9 which decreased.
Title:
Personalized approach to the rehabilitation of patients with piriformis muscle syndrome (PMS).

Authors:
Frolov, V. A., Akopyan, M. S., Kravchenko, M. V.

Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University), Department of Integrative Medicine.

Abstract:
Introduction:
The piriformis muscle syndrome (PSM) patients’ treatment is difficult due to the weak effectiveness of pharmacotherapy and the development of side effects (allergization, intoxication, addiction). Many studies in the field apply incobotulinum toxin and surgical treatment (Rodríguez-Piñero M, Vidal Vargas V, Jiménez Sarmiento A.S., 2018). In addition, non-invasive rehabilitation methods such as manual therapy, color impulse therapy apparatus Mellon (MEDTECHPROCOR, Russia) and acupuncture are used.

Materials and methods:
The study involves 60 patients with PMS aged from 30 to 40. All participants were divided into 2 groups. In the 1-st group (n = 30, 19 women, 11 men) a personalized approach to rehabilitation including manual and color impulse therapy, acupuncture, was tested. Group 2 (n = 30, 22 women, 8 men) was only subjected to manual therapy. The effectiveness of rehabilitation was assessed using VAS and modified Ashworth scales.

Results:
Student's t-test of paired samples proved the personalized approach to rehabilitation the most effective. The average value of t-emp applicability evaluating the proposed hypothesis (the rehabilitation method) is > 2.042 of t-critical values (p = 0.05). The average intensity of pain in the 1-st group was 2 + _0.25 while in the second -11 + _1.37. The average indicator of muscle tension was 1, 2 points and 2.5 points accordingly.

Conclusions:
Thus, a personalized approach is effective in PMS patients’ rehabilitation. For each participant, the number of sessions and the type of manipulation techniques were selected individually, taking into account their individual health characteristics and manifestations of the disease.
Personalized approach to the rehabilitation of patients with piriformis muscle syndrome (PMS).

Introduction:
Many studies in the field apply incobotulinum toxin and surgical treatment (Rodríguez et al., 2014). The piriformis muscle syndrome (PSM) patients’ treatment is difficult due to the weak effectiveness of pharmacotherapy and the development of side effects (allergization, intoxication, etc.).

Abstract:
For patients suffering from PMS, the effectiveness of rehabilitation was assessed using a philosophical, sports, pedagogical and psychological education. Field of the Russian Federation (Sechenov University), and teaches manual therapy at the faculty of integrative medicine.

Results:
The effectiveness of rehabilitation was assessed using modified VAS and modified Ashworth scales.

Conclusions:
Thus, a personalized approach is effective in PMS patients’ rehabilitation. For each participant, the number of sessions and the type of manipulation techniques were selected individually, taking into account their individual health characteristics and manifestations of the disease.

Fuentes Jiménez, Jorge Sabas

Biography:
School and High School: Baccalaureate in Biological Sciences at Colegio Patrocinio de San José, Madrid. Graduating in 2015 with honours. University: Studying Biotechnology Bachelor’s Degree, imparted by Universidad Politécnica de Madrid (ETSIAAB-UPM). English B2 (First Certificate in English) from 2013. Experience: ERASMUS stay during 1 school year in Bonn (Germany), enrolled in the Rheinische Friedrich-Wilhelms-Universität Bonn at the Center of Molecular Biology and Biotechnology, in the MSc. Molecular Biology and Biotechnology. Working on my Bachelor Thesis with the collaboration of Prof. Dr. Olga Golubnitschaja, in the field of Preventive, Predictive and Personalized Medicine, collaborating with the European project Passion HF - Patient Self-care using eHealth in chronic Heart Failure (Interreg NWE 702).

Title:
Application of artificial intelligence to the management of chronic pathologies on example of heart: Predictive, Preventive and Personalised Medical approach

Authors:
Fuentes Jiménez J. S., Lange-Rupprecht, V., Hofmann-Apitius, M., Golubnitschaja, O.

Abstract:
Heart Failure (HF) is a life-threatening chronic and rising disease nowadays. The risk factors comprise both non-modifiable (genetic e.g. in case of inborn HF) and modifiable ones such as sub-optimal lifestyle and diabetes type 2. Collateral pathologies can contribute to the development and progression of HF.

HF needs permanent monitoring; daily visits to the cardiologist and acute hospitalization increase the costs. Even though, devices for non-stop disease-monitoring created by application of artificial intelligence in medicine can revert today’s reactive following, reducing the expenses.

For such devices, input by both the clinical knowledge and computational sciences is needed, to carefully stratify the patients and adapt the programs to individual profiles. Knowledge from Predictive, Preventive and Personalised Medical (PPPM), can provide a solution to the increasing number of chronic diseases, affecting; not only healthcare, but all socio-economic factors.

As the “proof-of-principal” healthcare model, a HF patient stratification based on characteristic clinical parameters and biomarker sets is crucial for building a prototype device for daily monitoring and following of the patients. This is a consideration by international consortium operating within the European project.

To correctly develop a precise stratification according to individual profiles of risk factors, a broad literature search utilising highly innovative SCAIView bioinformatics tool was performed.

Regarding results, simple and daily monitoring of HF can become a reality, providing cheaper and personalised treatments.
Fuchsová, Radka, M.D.

Biography:
Radka Fuchsova graduated from Charles University Prague, Faculty of Medicine in Pilsen – generale medicine in 1996. She works in laboratory of University hospital in Pilsen. Her specialisation are Immunoassay methods for the detection and quantification of biologically important substances, interpretation of laboratory results and clinical consultations in the fields of endocrinology, tumour and bone markers. She participates in research and grant projects in the fields of prevention, early diagnosis and personalised medicine focused on biomarkers in oncology, endocrinology and preventative cardiology. Concerned with quality control of immunoassays and external quality control of hormone testing. Post-graduate student, thesis on vitamin D. She is an author and co-author of more than 20 articles in medical journals.

Title:
25-OH VITAMIN D STATUS IN PATIENTS WITH BREAST AND PROSTATE CANCER IN CZECH REPUBLIC

Authors:
Fuchsova, R.1, Topolcan, O.1, Karlikova, M.1, Treska, V.2, Narsanska, A.2, Windrichova, J.1
1Department of Immunochemistry Diagnostics
2Department of Surgery
University Hospital in Pilsen, Czech Republic

Abstract:
Vitamin D is a fat-soluble steroid prohormone which plays a major role in the calcium and phosphorus homeostasis. Low 25-OH vitamin D levels have been associated with many disorders, diseases and related outcomes: osteoporosis, cancer, cardiac risk, autoimmune, rheumatoid diseases, etc.

The aim:
To determine the frequency of 25-OH vitamin D hypovitaminosis in patients with different malignant cancer diseases. And available data are also presented.

Methods:
Serum levels of 25-OH vitamin D were measured using CLIA immunoassay developed by Abbott in groups of healthy individuals and in patients with prostate and breast cancer. Serum levels of 306 cancer patients were compared to 250 healthy individuals and further correlated with disease stage and season in each diagnosis. We used the following cut-off of 25-OH-D to define vitamin D status: deficiency < 50 nmol/L; insufficiency 50-75 nmol/L; sufficiency ≥ 75 nmol/L.

Results:
25-OH vitamin D levels were found to be significantly lower in both cancer patients compared to the healthy group. Only 13% of patients in breast cancer group were sufficient and none in prostate cancer group.

Conclusion:
Authors found a high incidence rate of severe hypovitaminosis D in cancer patients among Czech population. Assessment of 25-OH vitamin D levels and its supplementation may play an important role in the management of patients with different cancer diseases. In practice, unfortunately, supplementation is not usual in the Czech Republic.

This study was supported by the Ministry of Health of the Czech Republic - conceptual development of the University Hospital in Pilsen – FNPI research organization, 00669806.
Gavrish, Artem V.

Biography:
Resident of the Department of Pediatric Dentistry with Orthodontics. Artem V. Gavrish graduated from Voronezh State Medical University named after N.N. Burdenko, Faculty of Dentistry in 2018. Currently studying in the specialty "Orthodontics". The main field of scientific interest: "The physiology of the development of the dental system", "Diseases of the temporomandibular joint". Author of more than 15 articles. Went through the internship at Harbin Medical University, China. Winner of the Russian President's Scholarship for scientific achievements. Engaged in research work at the Department of Pediatric Dentistry with Orthodontics since 2014.

Email: artemgawrish@mail.ru

Title:
Detection of primary demineralization of tooth enamel as prevention of carious and non-caries diseases

Authors:
Voronezh State University, Voronezh, Russia

Abstract:
Clinical differential diagnosis of primary hypomineralization and demineralization is a complex task, which fundamentally determines the tactics of further treatment of both childrens and adults. First of all, the difference between these pathological conditions should be indicated.

By primary congenital hypomineralization is meant primarily "molar-incisal hypomineralization", characterized by systemic origin local congenital defects of the enamel of one or more first permanent molars associated with incisor lesions. However, quite often similar phenomena occur on the second temporary molars.

It is possible to establish exact quantitative criteria for the differential diagnosis of these conditions using CT densitometry. Native enamel without pathological changes has microhardness values in the range from 2800 to 4000 HU (Hausfields).

Research have shown that with primary congenital hypomineralization of permanent teeth, these values are reduced to 1600-2000 HU, with subsurface demineralization - 1500-2600 HU with a decrease in hardness of more than 30% in the layers lying under the preserved enamel area without changing the thickness of the enamel in the area equator tooth. When surface demineralization values lie in the region from 1600 to 2900 HU, but there is a thinning of the enamel layer of less than 1 mm in the equatorial region of the tooth.

The derived patterns make it possible to more reliably and confidently talk about the genesis of the identified pathological changes, and therefore - to choose the most optimal way to treat these conditions.
Title:

FTIR-spectroscopic markers in dentine and gingival fluids for preventive diagnostic of pathology carious processes in human dentine

Authors:

Abstract:

The aim of our work is a search for spectroscopic markers concerned with the pathology processes of the carious type in dentine basing on FTIR investigations of dentine and gingival fluids.

10 humans participated in the study. For each of the patient with the detected caries samples of the biological fluids were taken: dentine fluid and gingival crevicular fluid. The study of molecular composition of the dentine and gingival fluids were performed with the use of synchrotron radiation at IRM beamline.

FTIR-spectra of the samples of the dentine and gingival fluids obtained with the use of synchrotron radiation can be applied for the diagnostics of the pathological processes of the caries character in a dentine. Vibrations modes in FTIR spectra observed in the samples of dentine and gingival fluids characteristic of thiocyanates mean the development of the carious pathology. At the same time modes of the carboxyl group of complex ether detected in the spectra of dentine and gingival fluids certainly confirm the development of caries in dentine.

Based on the results of comparison of the molecular properties of the studied samples, it is possible to conclude that the spectroscopic markers of the development of caries in dentine found in the spectra of the dentine fluid can be easily detected without its labor-exhaustive and hardly expedient extraction since they are also present in the gingival fluid, and its sampling for the screening is not a difficult problem.

This work was supported by the grant of Russian Science Foundation, grant 16-15-00003.
Goldstein, Elisha

Biography:
Bar-Ilan University, Ramat-Gan, Israel. Elisha Goldstein started his training as Bioinformatist at the Bioinformatics Unit at Bar-Ilan University, the Mina and Everard Goodman Faculty of Life Science, Ramat-Gan, Israel in 2016. Since then Elisha gained experience in Computer Science and Biology with Hands-on courses as well as a project in Heart Disease analysis and Quantitative comparison of visual data by Dr. Sharon Gilaie-Dotan.
Email: Elishagoldstein0308@gmail.com

Title:
In-depth multiomic analysis for more predictive, preventive and personalized approach in management of liver malignancies

Authors:
Goldstein, E.1,2, Fröhlich, H.3, Golubnitschaja, O.4,5,6
1Bar-Ilan University, Ramat-Gan, Israel
2State NRW-Israel program, Excellence Friedrich-Wilhelms-University Bonn, Germany
3Bonn-Aachen International Centre for IT, Excellence Friedrich-Wilhelms-University Bonn, Germany
4Radiological Clinic, Excellence Friedrich-Wilhelms-University Bonn, Germany
5Breast Cancer Research Centre, Excellence Friedrich-Wilhelms-University Bonn, Germany
6Centre for Integrated Oncology, Cologne-Bonn, Excellence Friedrich-Wilhelms-University Bonn, Germany

Abstract:

Background:
Patients with primary and metastatic liver malignancies represent a highly heterogeneous patient pool characterized by some of the shortest life expectancies amongst oncology patients. Computational tools utilizing multi-parametric analysis are instrumental for comprehensive individualized patient profiling, predictive diagnostics and prognosis with a high potential for clinical implementation. This approach may significantly contribute to the paradigm change from reactive to predictive, preventive and personalized medicine benefiting patients predisposed to and/or diagnosed with the liver malignancies as well as healthcare systems at large [1,2].

Working hypothesis and Methods:
A prospective pilot research project performed at the University of Bonn has identified potential multi-omic biomarker patterns for predictive stratification of liver cancer patients who underwent SIRT versus TACE treatment [3,4]. It was concluded that the treatment option is decisive for the quality of individual outcomes. Consequently, the treatment selection should be tailored to the individualized patient profile. In the current project we hypothesized that a comprehensive multi-omic analysis using machine learning is an optimal approach to reveal diagnostic added value of the data collected, in order to improve the overall disease management for the cohort of patients with
liver carcinomas. Cluster analysis and analysis for longitudinal data are used for detecting main trajectories of biomarkers and consider the type of treatment as predictors for those trajectories.

**Expected impacts:**
Besides in-depth understanding of the molecular mechanisms which underlie the treatment approaches used and individual outcomes, better justified selection of the treatment algorithms is expected. Treatments tailored to the person may lead to significantly improved individual outcomes benefitting the affected patients and the overall disease management following the advanced concepts of predictive, preventive and personalized medicine.

**References:**
Golubnitschaja, Olga, Dr., Professor

Biography:

Dr. Golubnitschaja, Department of Radiology, Medical Faculty of Rheinische Friedrich-Wilhelms-University in Bonn, Germany, has studied journalism, biotechnology and medicine and has been awarded research fellowships in Austria, Russia, UK, Germany, Netherlands, and Switzerland (early and predictive diagnostics in paediatrics, neurosciences and cancer). Dr. Golubnitschaja is the author of more than 400 well-cited international publications (research and review articles, position papers, books and book contributions) in the innovative field of predictive, preventive and personalised medicine (PPPM) with the main research focuses on pre- and perinatal diagnostics, diagnostics of cardiovascular disease and neurodegenerative pathologies, predictive diagnostics in cancer and diabetes.

Awards: National & International Fellowship of the Alexander von Humboldt-Foundation; Highest Prize in Medicine and Eiselsberg-Prize in Austria.


Dr. Golubnitschaja is the European Representative in the EDR-Network at the National Institutes of Health USA, http://edrn.nci.nih.gov/.

Dr. Golubnitschaja is a regular reviewer for over 30 clinical and scientific journals and serves as a grant reviewer for the national (Ministries of Health in several European countries) and international funding bodies.

Since 2007 until the present, she works as the European Commission evaluation expert for FP7, Horizon 2020, IMI-1 (Innovative Medical Initiatives) and IMI-2. In years 2010-2013 she was involved in creating the PPPM related contents of the European Programme “Horizon 2020”.

Currently, Dr. Golubnitschaja is Vice-Chair of the Evaluation Panel for Marie Curie Mobility Actions at the European Commission in Brussels.

Email: olga.golubnitschaja@ukbonn.de
Costigliola, Vincenzo, MD

Biography:
RELEVANT EDUCATION: Dr. Costigliola graduated in Medicine from the University of Naples in 1972 and with distinction, in Anesthesiology and Intensive Care from the University of Pisa in 1978. He also completed studies in Rheumatology, Dermatology, Proctology, Oncology, Surgery, Drugs Abuse, Emergency Treatment, Disaster Action, Hospital Organization, Medical Teaching Methodology and Computer and Audio-Visual Training for the Medical Profession.

- President of E.M.A. (European Medical Association)
  http://www.emanet.org/
- President of EPMA (European Predictive, Preventive, Personalized Medicine)
  http://www.epmanet.eu/
- President of E.D.A. (European Depression Association)
  http://www.eddas.org/
- Member of Board of “The European Biotechnology Association”
  http://www.ebtina.net
- Fellow of World Certification Institute
- President of Oxford Union Academic Board of Directors http://www.ebaoxford.co.uk
- Member of the International Advisory Board at King Abdulaziz University S.A.
  http://iab.kau.edu.sa/
- Fellow and Councilor of WCI
  http://www.worldcertification.org/the-council.
- Member of the Editorial Board of the EPMA Journal (BMC/Springer)
- Good experience in clinical trials
- Extensive experience in European health care field
- Main contractor and participant in many EU projects of dg 22 and dg 5
- Selected as expert-evaluator in the 5th Framework programme
- Extensive experience in informatics’ health programmes
- Teaching experiences
- Nationals and internationals conferences as a speaker
- Publishing experiences

Languages: Italian, French, English, and Spanish
Title:

Flammer Syndrome – From Phenotype to Associated Pathologies, Prediction, Prevention and Personalisation: a 5-year project of the EPMA expert group nominated for the international award

Authors:

Golubnitschaja, O.1,2,3, Costigliola, V.4

1Radiological Clinic, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
2Breast Cancer Research Centre, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
3Centre for Integrated Oncology, Cologne-Bonn, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
4European Medical Association, Brussels, Belgium

Abstract:

Unmet healthcare needs of young populations and individuals in suboptimal health conditions are the key issue of currently observed epidemics of non-communicable disorders. Moreover, an unprecedented decrease in the average age of onset of these disorders is recorded. The majority of non-communicable disorders carry a chronic character by progressing over a couple of years from a reversible suboptimal health condition to irreversible pathology with collateral complications. The timeframe between both conditions is the operational area for predictive diagnosis and identification of persons at risk by innovative screening programmes followed by the most cost-effective personalised treatment possible, namely primary prevention tailored to the person.

To cover these deficits in current healthcare, since 2014 EPMA has strongly promoted the research field of “Flammer Syndrome” (FS). FS phenotype is clearly described in the literature (first publication appeared in the EPMA J. 2014) as being strongly relevant for several pathologies, and, therefore, is of great clinical utility for the paradigm change from reactive to predictive, preventive and personalised medical approach based on innovative screening programmes, patient stratification, early diagnostics and improved treatment algorithms tailored to the individualised patient profile, amongst others.

During last 5 years, an international EPMA expert group has performed a series of pilot studies in the field resulted in a cumulative publication of the book “Flammer Syndrome – From Phenotype to Associated Pathologies, Prediction, Prevention and Personalisation” (Ed. Golubnitschaja O.) in the EPMA/Springer series “Advances in PPPM”, July 2019, ISBN 978-3-030-13552-2. Due to the valuable contribution to innovative bio/medical science, the European Medical Association (EMA, Brussels) has nominated the book for a prestigious international award.
Gorshkov, Dmitry, MD, PhD, Associate Professor

Biography:
Dmitry Gorshkov, associate professor of pharmacology of the Astrakhan State Medical University, Russia, graduated from pediatric faculty of the Astrakhan state medical academy in 1999. In 2000 got a post-degree education in an internship of the specified academy. Since 2000 till present the teacher and the associate professor of pharmacology of the Astrakhan state medical university. In 2012 defended the dissertation for a degree of the candidate of medical sciences on a subject: "Influence of erythropoietin on processes of adaptation of an organism at toxic influence".

Title:
Population screening of premorbid disadaptation by laboratory methods

Authors:
Gorshkov, D., Ivanov, P., Nikulina, D., Ponomarev, A., Voronkova, M.

Department of Biochemistry and Clinical Laboratory Diagnostics of Astrakhan State Medical University, Russia

Abstract:
At present, genetic markers of heavy diseases are of paramount importance in preventive medicine. However, it is also important to identify homeostatic disadaptation under the influence of adverse external factors. In the Astrakhan region, natural conditions with the increased man-made factors make an additional burden on the human body. The manifesting form of a health disorder is the adaptation breakdown of the functional reserves of the body, which is preceded by a state of tension of the regulatory and metabolic pathways or a premorbid form of the health disorder. For screening premorbid disadaptation, a laboratory tests panel was formed taking into assessment their informative value, adequacy, technical and financial accessibility. To determine toxic effects used test for sulfohemoglobin.

More than 2000 people of ages from 3 to 61 were examined: 919 adults and 1327 children. As is known, children are the most eco-sensitive, since do not have stable adaptation mechanisms and protective reactions. A comparative analysis of traditional and original protocols in 367 children showed that laboratory screening (more than 20 blood tests), including classes immunoglobulins, acute phase proteins, reveals hidden forms of inflammation, anemia and immunodeficiency and the body's readiness to form allergic reactions. The possibility of assessing the state of the body of an individual and the group as a whole as a whole is shown. Population screening with some laboratory tests indicted significant changes in the hemostatic state of 10-15% examined people. Pre-nosological detection of premorbid disadaptation makes it possible to more effectively apply correct rehabilitation measures.
Gridin, Leonid Aleksandrovich, PhD, Professor

Biography:
L.A. Gridin works as a professor of the Integrative medicine department Federal State Autonomous Educational Institution of Higher Learning I.M. Sechenov First Moscow State Medical University of the Ministry of Healthcare of Russian Federation (Sechenov University).

He is an author of more than 285 articles in medical journals, including 8 monographs (pl. Diagnosis of the human condition: mathematical approach).

Title:
Modern interpretation of the efficiency criteria for blockchain technologies in the medical care of the Russia population

Authors:
Gridin, L. A.¹, Tsypkin, Y. A.², Kudryashova, T. A.³

¹Federal State Autonomous Educational Institution of Higher Learning I.M. Sechenov First Moscow State Medical University of the Ministry of Healthcare of Russian Federation (Sechenov University)
²Federal State Budgetary Educational Institution of Higher Learning State University of Land Use Planning

Abstract:
The authors describes the nearest prospects of information technologies development for health protection of the population in Russia.

The intensification of negative trends in the Russian health care system has been noted. A significant effect on improving the health of the population can give priority development of prophylactic or preventive medicine.

Necessary approaches for the further development of preventive medicine trends that correspond to modern requirements are defined. These methods include the widespread introduction of modern information technologies. The immediate prospects of the information technologies development in the public health field public in Russia are described.

An approximate model of the integration of the common information space has been designed. The information area based on blockchain-technologies accumulates data from regional (territorial) and problem-oriented medicine information systems. The information space is based of modern digital accounting technologies (blockchain) and allows us to optimally implement the basic principles of organization of modern accounting medical systems.

The availability of such information solutions can be achieved through the use of mobile applications. Their modern development allows us to uniquely identify each user, using the electronic signature procedure. This greatly simplifies the process of obtaining and analyzing the requested information.

The creation of a single information space will give users the possibility of authorized access to primary information, will allow us to organize a comprehensive statistical accounting in the health care system, based on reliable primary information and adapted to solve the problems of preventive medicine at different levels of the system.

An algorithm that works within a single information space is proposed. The algorithm is necessary for information support of the medical personnel actions in diagnosing patients' diseases and prescribing treatment.

High-speed mobile networks and processing technologies of big data should be widely used. Specialized integrated solutions based on blockchain technologies are important to increase the availability of medical services in order to develop individually focused preventive medicine.
Grinenko, Eleonora, Assistant

Biography:
Grinenko Eleonora graduated from Academician I.P. Pavlov First State Medical University, Faculty of Dentistry in Saint-Petersburg, Russia in 2015. She has finished residency in general dentistry, therapeutic dentistry and orthodontics in 2016 and 2018. Now she is a post-graduate student with the dissertation theme “Systemic approach to the development of a professional oral hygiene program among patients with diabetes mellitus”. She currently works as an assistant in the Department of Therapeutic Dentistry and Periodontology and as a dentist in City Periodontal Center “PAKS” Ltd. She participates in research regarding relationship between diabetes and oral health since 2013 and is an author of more than 35 articles and abstracts in medical journals and abstract digests, H-index 2.

Title:
Systemic approach to the development of a professional oral hygiene program among patients with diabetes mellitus.

Authors:
Grinenko, E. V.1,2, Orekhova, L. Yu.1,2, Musaeva, R. S.1, Silina, E. S.1

1Department of therapeutic dentistry and periodontology of Federal State Budgetary Educational Institution of Higher Education «Academician I.P. Pavlov First St. Petersburg State Medical University» of the Ministry of Healthcare of Russian Federation.
2City Periodontal Center «PAKS» Ltd., Saint-Petersburg, Russian Federation.

Abstract:
Outcome of periodontal disease treatment depends on many factors, one of which is the identification of main causes of disease, for example, diabetes. Also, decisive factor in success of treatment is the patient’s compliance.

The aim of work was to study effectiveness of conservative periodontal treatment among different aged patients with type 1 diabetes. We conducted a survey of 65 patients aged 20 to 50 years who have diagnosis of type 1 diabetes. All patients were interviewed and examined with hygienic and periodontal indices, pH-measurement of periodontal liquid. Then, all patients underwent a professional oral hygiene complex. After 4 weeks a second examination was conducted.

According to data of determining level of compliance young patients with type 1 diabetes have on average a weakly positive compliance, while older patients are practically not disposed to treatment. Average values of hygienic indices were satisfactory. Periodontal indices indicated presence of gingival inflammation. The pH of periodontal liquid had the lowest values among patients of age 30-39. After 4 weeks compliance increased by an average of 3.5 units. Re-measuring indices of hygiene and periodontal status showed a significant decrease in amount of dental plaque, calculus and gum inflammation.

It can be concluded that with age among patients with type 1 diabetes mellitus compliance decreases, which in a certain way affects state of oral cavity. 1 month after conducted professional oral hygiene complex there was found an improvement in oral cavity status, as well as an increase in the level of compliance.
Abstract:

Outcome of periodontal disease treatment depends on many factors, one of which is the identification of main causes of disease, for example, diabetes. Also, decisive factor in success of treatment is the patient's compliance. It can be concluded that with age among patients with type 1 diabetes mellitus compliance decreases, while older patients are practically not disposed to treatment.

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It can be concluded that with age among patients with type 1 diabetes mellitus compliance decreases, while older patients are practically not disposed to treatment. Periodontal indices indicated presence of gingival inflammation and calculus. Average values of hygienic indices were satisfactory. Periodontal indices indicated presence of gingival inflammation and calculus. Average values of hygienic indices were satisfactory.

The aim of work was to evaluate the level of compliance of patients with type 1 diabetes mellitus, as well as to determine factors affecting it. A survey of 65 patients aged 20 to 50 years who have diabetes was conducted. We conducted a survey of 65 patients aged 20 to 50 years who have diabetes. We conducted a survey of 65 patients aged 20 to 50 years who have diabetes.

All patients were interviewed and examined since 2013 and are an author of more than 35 articles and abstracts in medical journals and abstract collections, pH index 4.

Habartova, Lucie, Ph.D.

Biography:

Lucie Habartova graduated from the Faculty of Chemical Engineering at the University of Chemistry and Technology Prague in 2013 with her thesis “Analytical utilization of chiroptical methods in the diagnosis of metabolic diseases”, and received her Ph.D. upon defending her dissertation „Chiroptical spectroscopy in the diagnostics of metabolic diseases and cancer” in June 2018. Since August 2018, she has been working as Assistant professor at the Dept. of Analytical Chemistry, UCT Prague. Her research activities include the development and utilization of spectroscopic techniques for biomarker search and disease diagnostics. In 2016, she received the Shimadzu Award, and her publications were recognized the best original work of young researchers in the field of Analytical Chemistry by the Ioannes Marcus Marci Spectroscopic Society in 2016 and 2018. She is an author/co-author of one book chapter and 16 articles in peer-reviewed impacted journals with more than 40 citations; h-index 4.

Title:

Molecular spectroscopy as a novel trend in biomarker research and cancer diagnostics

Authors:

Habartova, L., Setnicka, V.

Department of Analytical Chemistry, University of Chemistry and Technology Prague

Abstract:

Despite an immense progress in understanding the pathophysiology of serious degenerative diseases, including cancers, reliable early diagnosis remains unachievable in many cases. The currently employed biomarkers lack specificity; the diagnostic approaches exhibit limited sensitivity and often require invasive procedures. These obstacles may be overcome by implementing methods of molecular spectroscopy into the diagnostic scheme. Many studies prove that molecular spectroscopy is a powerful tool for the study of pathology-induced variations within essential biomolecules. Such variations in not only concentration, but also structure occur long before the disease onset, thereby widening the therapeutic window. Moreover, these variations may be easily observed in tissues or in biofluids, such as blood or urine, which contributes to minimal invasiveness of the diagnostic procedure. Analyzing blood plasma of patients suffering from different types of gastrointestinal tumors (pancreatic, colon or liver cancer) with the use of molecular spectroscopy, we were able to identify disease-specific patterns, which allowed us to distinguish not only between the patients and healthy controls, but also between particular cancer types with sensitivity and specificity exceeding 90 % after cross-validation. This approach has also been successfully applied to predict the recurrence possibility of colon cancer within patients in remission, and to monitor diabetics with a genetic load of pancreatic cancer. Regarding the achieved results it may be stated that molecular spectroscopy has an untapped potential to serve as a valuable supportive tool in disease diagnostics.

Supported by the Ministry of Health of the Czech Republic 16-31028A and NV19-08-00525.
Title:
Early surgical management of medication-related osteonecrosis of the jaw in cancer patients

Authors:
Hauer, L., Jambura, J., Hrušák, D., Merglová, V., Pošta, P., Genčur, J.

Department of Dentistry and Oral and Maxillofacial Surgery, University Hospital and Faculty of Medicine in Pilsen, Charles University, Czech Republic

Abstract:
Objectives:
Medication-related osteonecrosis of the jaw (MRONJ) is a rare, serious and disabling adverse effect of antiresorptive and/or targeted therapy in cancer and osteoporotic patients. No evidence-based guidelines for management of these lesions are available to date.

Material and Method:
The monocentric retrospective evaluation of surgical therapy of MRONJ in cancer patients, treated in the time period 3/2013-3/2018 using the uniform department-specific protocol was performed. The monitored parameters were: gender, age, underlying disease, type and duration of antiresorptive medication, co-morbidity, other risk pharmacotherapy, initiating factors, localization and stage of MRONJ, type of surgical therapy, outcomes and follow-up. The control group was composed of cancer patients suffering from MRONJ treated conservatively.

Results:
59 patients with 81 MRONJ lesions of stage 1 (14.8%), stage 2 (60.5%) and stage 3 (24.7%) were treated surgically. Complete healing was achieved in 92.5% of 80 lesions treated primarily by debridement and/or sequestrectomy (in 76.3% of cases in 2 weeks). One lesion healed after the primary segmental resection of the mandible. The mean follow-up was 12.1 months. The control group was consisted of 32 lesions in 26 patients. Complete healing occurred in 18.8% of lesions, on average in 52 weeks. The mean follow-up was 14.9 months.

Conclusion:
The presented protocol for surgical therapy was effective in the management of MRONJ in cancer patients. The early surgery is preventive in terms of MRONJ-related complications and lesions progression. It leads to an improvement in quality of life and it offers the possibility to continue with antiresorptive/anticancer therapy if interrupted.
Title:
Surgical therapy of prostate cancer in CZ and particularly in Plzeň

Abstract:
In 2016, 7305 new prostate cancers (PC) (8.4% of all malignancies) were diagnosed in CZ. There were performed in 2016/2017 in CZ 2522/2689 radical prostatectomies (RP). It means 35 % new cases of PC in CZ are indicated for RP. In Ústí n.L. county 47%, Olomouc county 46% (equipped with robotic system), Plzeň county 29% only (robotic system not available). Way of performance of RP in CZ 2017: 59% robotic, 23% open, 18% laparoscopic. In Plzeň county it was 73% laparoscopic, 11% open and 16% robotic (these man had to travel to any robotic centre). In Plzeň were done 145(2016), 128(2017) and 123(2018) RPs, all laparoscopic. Laparoscopic RP was done in Plzeň since 2008 to 6/2019 in 960 cases. Average age 64.7 (41.7–81.8), PSA 9.85±6.39 (0.72–5.42) ng/ml, PHI 63.8±32.14 (8.39–292.74). Mainly extraperitoneal, only 62(6.5%) transperitoneal. 222(23%) with LND (lymph node dissection), nerve sparing in 241(25.2%) bilaterally and 122(12.7%) unilaterally. Preoperative assessment with MRI in 695(72.5%), cholin PET MRI 63(6.6%), PSMA PET MRI/CT 29/4(3.0/0.4 %). Is planned to buy robotic system.

Conclusion:
PC is the most common malignancy in men in CZ, one third of them indicated for radical prostatectomy. Robotic approach dominates. In Plzeň, PHI and MRI is indicated preoperatively in all men and in higher risk PC PSMA PET MRI. Nerve sparing RP indicated in about ¼ (low risk of extracapsular extension), LND in ¼. LND is indicated in the last year by Briganti nomogram 2018 (MRI incorporated), cut-off > 7%.
Houfková, Kateřina, RNDr.

Biography:
I graduated from University of South Bohemia, Faculty of Science in Ceske Budejovice with master's degree in 2016. In 2017 I took a RNDr. degree at the same university with the rigorous thesis “Predictive relevance of miR-34a, miR-224 and miR-342 in patients with advanced squamous cell carcinoma of the lung undergoing palliative chemotherapy”. Nowadays, I am a PhD student at Charles University, Faculty of Medicine in Pilsen and the topic of my dissertation thesis is “Prediction and improvement of the effect of chemotherapy in lung cancer”. I participate in cancer research in the laboratory at the Department of Biology.

Email: Katerina.Houfkova@lfp.cuni.cz

Title:
Predictive relevance of microRNAs in patients with NSCLC undergoing palliative chemotherapy

Authors:
Houfkova, K.¹, Kulda, V.², Svaton, M.³, Pesek, M.³, Pesta, M.¹
¹Department of Biology, Faculty of Medicine in Pilsen, Charles University
² Department of Medical Chemistry and Biochemistry, Faculty of Medicine in Pilsen, Charles University
³ Department of Pneumology and Phthisiology, Faculty of Medicine in Pilsen, Charles University

Abstract:
Lung cancer is the most common type of cancer worldwide. Approximately 85% of all lung cancer cases are non-small cell lung cancer (NSCLC), which includes two major histological subtypes: squamous cell carcinoma (SCC) and adenocarcinoma. SCC represents 25-30% of cases of NSCLC. Chemotherapy is an essential modality of palliative treatment for inoperable SCC at advanced stages. The response rate to chemotherapy varies widely from patient to patient; therefore, it is of interest to find biomarkers that predict the effect of cytostatic therapeutics. MicroRNAs (miRNAs) have the potential to become valuable predictive markers for non-small cell lung cancer (NSCLC) attributing to their stability in biological samples. The aim of the present study was to evaluate the association of the expression of miRNAs involved in the processes resulting in chemotherapy resistance with the overall survival (OS) time of patients with advanced SCC receiving palliative care. From the 17 miRNAs of interest, low expression levels of miR-342 and high expression levels of miR-34a and miR-224 were associated with a reduced OS time in subgroups of patients based on smoking status and treatment modality. Using cluster analysis, associations between combinations of miR-34a, -224 and -342 expression levels with patient survival were identified. Patients with the high or low expression of all three miRNAs exhibit a significantly shorter OS time than those with other combinations of miR-224, -342 and -34a expression. We hypothesize that the effect of a particular miRNA is dependent on the expression level of other members of the miRNA network.
on the expression level of other - of all three miRNAs exhibit a significantly shorter OS time than those with other combinations of miR - treatment modality. Using cluster analysis, associations between combinations of miR - miRNAs of interest, low expression levels of miR - overall survival (OS) time of patients with advanced SCC receiving palliative care. From the 17 - the expression of miRNAs involved in the processes resultin - potentia - to find biomarkers that predict the effect of cytostatic therapeutics. MicroRNAs (miRNAs) have the - Lung cancer is the most common type of cancer worldwide. - Abstract:

Predictive, Preventive and participatory medicine (3PM) is one of the main challenges nowadays due to older populations and lifestyle changes especially in developed countries. In this sense, the information technology (IT) community is also participating to support the scientific community achieving 3PM goals with a wider impact on populations. This research area is getting more and more attractive, especially due to recent technologies dealing with artificial intelligence (AI). In this talk, 3PM applications are handled from an IT perspective. Examples of how IT tools can assist doctors and patients in 3PM are discussed. Perspectives and future research avenues in the same field are also pointed out.

Title:

IT-3PM: Information Technology for Predictive, Preventive and Participatory Medicine

Authors:

Chaari, L.¹,²

¹University of Toulouse, IRIT laboratory
²University of Sfax, MIRACL laboratory

Abstract:

Predictive, Preventive and participatory medicine (3PM) is one of the main challenges nowadays due to older populations and lifestyle changes especially in developed countries. In this sense, the information technology (IT) community is also participating to support the scientific community achieving 3PM goals with a wider impact on populations. This research area is getting more and more attractive, especially due to recent technologies dealing with artificial intelligence (AI). In this talk, 3PM applications are handled from an IT perspective. Examples of how IT tools can assist doctors and patients in 3PM are discussed. Perspectives and future research avenues in the same field are also pointed out.
Chirkova, Natalia V., Dr.Med.Sc., Professor

Biography:
She graduated from the Voronezh State Medical Academy in 1997. From 1997 to 1998 she studied in clinical internship. From 2000 to 2003, she studied at the Postgraduate Orthopedic Dentistry Department. In 2003 she defended the dissertation for the degree of the PhD. on the topic: "Clinical and experimental substantiation of the use of a new modified elastic polymer for the bases of removable laminar prostheses". Since 2013, she was an associate professor in the Department of Propaedeutic dentistry. In 2013 she defended her doctoral thesis on the topic: "Clinical and experimental study of dental materials modified by nanoscale particles of silicon". Since 2015 she is a professor in the Department of propaedeutic dentistry. During the period she has published 92 scientific papers.

Title:
Prevention of pain during endodontic treatment

Authors:
Chirkova, N. V.¹, Morozov, A. N.¹, Nikogosyan, S. M.¹, Vetrova, E. V.¹, Vecherkina, Z. V.¹, Moiseeva, N. S.²
¹Department of Propaedeutic Dentistry
²Department of Oral and Maxillofacial Surgery
Voronezh N.N. Burdenko State Medical University, Russia

Abstract:
The study involved 200 patients with acute complicated forms of carious lesions. The stratification of the participants into 2 groups of 100 people was carried out in accordance with the traditional approach and the antinociceptive protection technique. The traditional approach for endodontic intervention was used in the control group (n = 100 people): local anesthesia with articaine hydrochloride 40 mg / ml + adrenaline hydrochloride 10 μg / ml 1.7-3.4 ml; the use of ketorolac tromethamine 10-40 per os during the first day of the postoperative period. The developed approach was applied to the main group (n=100 people): ketorolac tromethamine 30 mg in 10-20 ml of 0.9% NaCl solution iv bolus shortly before the endodontic intervention and local anesthesia (articaine hydrochloride 40 mg / ml + adrenaline hydrochloride 10 μg / ml 1.7-3.4 ml). The standardization of the compared groups was achieved by ensuring the identity of the intra-group distribution of the participants in accordance with gender and age, forms of acute carious complications, local anesthesia techniques. The pain syndrome and the level of situational and personal anxiety were assessed during the follow-up period. The developed program of antinociceptive protection for endodontic interventions is an optimal solution of the problem due to the following functional characteristics in the form of statistically significant advantages in comparison with the traditional approach (p<0.05): a decrease in the level of intraoperative "stressority" by 25.8-48.14%; the actual prevention of the development of postoperative pain syndrome of any intensity in 96% of cases; the prevention of an increase in the level of situational anxiety due to the absence of postoperative pain syndrome in 77% of cases.
Prevention of pain during endodontic treatment

Abstract:

The study involved 200 patients with acute complicated forms of endodontic intervention and local anesthesia (articaine hydrochloride 40 mg / ml + adrenaline hydrochloride 10 μg / ml 1.7 ml). The developed program of antinociceptive protection technique. The traditional approach for endodontic intervention was used in t

The Text neck syndrome effect on microcirculation of periodontal tissues blood vessels.

Authors:

Iamanidze, Nino, assistant

Biography:

Iamanidze Nino graduated from Academician I.P. Pavlov First State Medical University, Faculty of Dentistry in Saint-Petersburg, Russia in 2013. She has finished internship in 2014 and residency in general dentistry, therapeutic dentistry in 2016. She currently works as an assistant in the Department of Therapeutic Dentistry and Periodontology and as a dentist in City Periodontal Center “PAKS” Ltd. She currently works as an assistant in the Department of Therapeutic Dentistry and Periodontology.

She participates in research regarding relationship between general health and oral health since 2013 and is an author of more than 25 articles and abstracts in medical journals and abstract digests, H-index 2.

Title:

The Text neck syndrome effect on microcirculation of periodontal tissues blood vessels.

Authors:

Iamanidze, N.1,2, Orekhova, L.1,2, Pachkoria, M.1, Loboda, E.1,2

1Department of therapeutic dentistry and periodontology of Federal State Budgetary Educational Institution of Higher Education «Academician I.P. Pavlov First St. Petersburg State Medical University» of the Ministry of Healthcare of Russian Federation.

2City Periodontal Center «PAKS» Ltd., Saint-Petersburg, Russian Federation.

Abstract:

Current concepts of etiology of periodontal diseases are based on multifactorial bases. One of the reasons for this process can be bad posture caused by excessive use of computers and "electronic gadgets".

We decided to confirm or deny the existence of a causal connection between incorrect posture when using computers and mobile devices and circulatory disorders in periodontal tissues.

We conducted a survey, a standard dental examination and a functional study using a device for ultrasonic dopplerography "Minimax-Doppler-K" of 60 patients aged 19 to 25 years. The participants in the study were people whose activities do not involve daily work on computers and mobile devices (group A), and people associated with information technology (group B).

As expected, the results of the survey in both groups turned out to be different. According to the survey, characteristics of the representatives of each group of subjects were compiled. In a functional study, the initial level of the average linear velocity of blood flow in group A was 0.57 cm/s and 0.47 cm/s in group. After a 30 minute study, indicators decreased in both groups, but more pronounced in group A than in B.

During the study, it was established experimentally that long head tilting and incorrect posture when working with computers and electronic gadgets lead to impaired on microcirculation of periodontal tissues.

Objective examination data (ultrasonic dopplerography) confirm the survey in that the longer a person uses his electronic device, the higher the risk of Text neck syndrome, blood supply disorders and periodontal pathologies.
Kabardina, Ekaterina Vladimirovna, ophthalmologist

Biography:
Ophthalmologist of the Ophthalmological Department of the State budgetary Institution of the Rostov region "Rostov regional clinical hospital" since 2008. Since 2015 he is a graduate student of the Department of ophthalmology of Rostov State Medical University. Ophthalmosurgeon, engaged in cataract surgery, glaucoma surgery, vitreoretinal surgery. The theme of scientific research is devoted to neurodegenerative processes in the retina and optic nerve in patients with Central retinal vein thrombosis. Author of more than 30 scientific articles, 2 patents.

Title:

Personalized assessment of the progression of neurodegenerative processes in the retina in patients with post-thrombotic retinopathy

Authors:
Kabardina, E. V.¹, Shurygina, I. P.²

¹State budgetary Institution of the Rostov region "Rostov regional clinical hospital"
²Federal State Budgetary Educational Institution of Higher Education "Rostov State Medical University" of the Ministry of health of the Russian Federation

Abstract:

Material and methods:
Two groups of patients aged 45 to 68 years with post-thrombotic retinopathy (PR) were identified, the first group included 56 patients (56 eyes) with low visual acuity 0.1-0.2 and progressive neurodegenerative processes (NDP) in the retina, and the second group included 59 patients (59 eyes) with high visual acuity up to 0.9-1.0 and stabilization of NDP processes in the retina. Each patient underwent optical coherence tomography (OCT) of the macula with measurement of mean retinal thickness (MRT) and additionally, mean blood flow rate (Vmed, sm/s) of the Central retinal artery (CRA) was determined using Philips “EnVisor C” (USA) ultrasound diagnostic system in pulsed-wave dopplerography. The studies were repeated every six months for three years.

Result:
In the first group, all patients noted: reduction of Vmed in CRA by 25% or more from the norm and pathological thinning of the retina in the macula. In the second group of 50 patients (50 eyes), the above parameters were within normal values and only 9 patients (9 eyes) were determined to reduce Vmed in CRA by no more than 12% of normal and borderline retinal thinning in the macula.

Conclusions and recommendations of the expert:
Our studies have revealed a link between a decrease in MRT, a decrease in the Vmed CRA parameter and a decrease in visual acuity, which undoubtedly confirmed the progression of NDP in the retina in PR.

We believe it is important to build the tactics of conducting the patient with the PR considering the individual parameters Vmed CRA for the purpose of prevention of the progression of NDP in the retina.
Kalika, Lev, DC, RMSK

Biography:
Education: Doctor of Chiropractic from National University, Chicago 1993-1997; B.S – Brooklyn College, New York, NY. 1990-1993; Metchnikov Medical University, Odessa, Ukraine 1986-1989
Advanced Training: Fellowship in Manual Medicine and Rehabilitation in Motol Hospital, Prague, Czech Republic under prof. Karel Lewit M.D. 1997-1998; Fellowship in Manual Medicine and Rehabilitation in Charles University, Prague, Czech Republic under prof. Vladimir Janda M.D.
Certifications: RMSK (registered musculoskeletal sonographer); DNS (Dynamic Neuromuscular Stabilization); MPI (motion performance institute); ISM (Integrated System Approach)
Over hundred other postgraduate courses in the field of orthopedics, diagnostics ultrasonography, physical medicine, spinal and neuromuscular disorders.
Unique Experience: Four years of experience treating patients and designing applications with CAREN (computer assisted rehabilitation environment)
Areas of special professional interest and training: Diagnostic musculoskeletal ultrasonography, Dry needling, application of diagnostic ultrasonography in rehabilitation medicine, posture, gait analysis for runners and people with orthopedic disorders of lower extremities and lower back pain, motor development in children, byopsychosocial origin of back pain, sports medicine, rehabilitation of tendon injuries, injury prevention, weight bearing imbalance and post surgical rehabilitation, motion analysis and virtual reality rehabilitation.
Author of number of articles on subjects of: physical therapy, sport medicine, dry needling and rehabilitative sonography.
Languages: English; Russian; Ukrainian; Czech
https://www.researchgate.net/profile/L_Kalika

Title:
Urbanisation demands novel rehab, individualized high-tech PPPM solutions for megapolis patients

Authors:
Kalika, L. 1; Bubnov, R. 2,3
2Clinical hospital ‘Pheophania’ of State Affairs Department, Kyiv, Ukraine;
3Zabolotny Institute of Microbiology and Virology, NAS of Ukraine

Abstract:

Keyword:
PPPM, rehabilitation, physical therapy, CAREN, pain, stress, urbanisation, health care
Introduction:
Modern society brings new challenges modifying human body. This attains extreme levels in ultraubanistic environment, the postindustrial megapolis inhabitants are exposed to the irrevocable pressure of stress; distant walking on flat rigid surface with using inappropriate shoes; long sitting in incorrect postural and ergonomic position in work place; adverse effects of hypodynamia or contrary overusing sport activities; combined with life overactivity, violated circadian rhythms, respiratory factors, food regimes leads to chronic alteration of health in the stress-posture-pain axis. On other hand, accessible high quality professional care in spite of care and social development is problematic. People under stress largely are unable to make correct decisions and tend to undergo malpractice. PPPM approach can solve this stalemate in the education and health care for providing personalized evidence based sophisticated rehab [1]. Precise evaluation of motion and posture is a crucial task in management such patients. Integrative protocol including multilevel assessment of postural imbalance has been developed [2] using tools like US, CAREN, static and dynamic tests, pressure analysis, and extensive molecular profiling. Computer Assisted Rehabilitation Environment (CAREN) [3] triggering positive emotions and relaxings allow experienced PT catching biomarkers associated with every muscle in the body. Innovative concept of Flammer phenotype would open new avenues to distinguish patients predisposed to aggressive urban surrounding and develop patient-specific rehab care [4]. OPTIMAL theory of motor learning identifies three factors key to the optimization of motor performance and learning is example of personalized treatment.

Conclusion:
Megapolis patients need more precise diagnosis and faster therapies, individualized high-tech PPPM solutions consider using imaging-, electronically-captured biomarkers based on sophisticated tests and deep neuromuscular background and multidisciplinary knowledge.

References:
Kapalla, Marko, RNDr., PhD., Negentropic Systems, s.r.o, Ružomberok, Slovakia

Biography:
Marko Kapalla graduated in 1994, in Biochemistry, at the Faculty of Natural Sciences of Comenius University in Bratislava, Slovakia. In 1999, his book “Complexity of Information” was published by Veda, the publishing house of Slovak Academy of Sciences, and in 2001 he earned academic degree “RNDr.” in Physical Chemistry. In 2014 he earned PhD in Normal and Pathological Physiology at the Faculty of Medicine of Comenius University. Since 2007 he is CEO of Negentropic Systems. In 2008 he became a founding member of EPMA. Since 2018 he is CEO of PPPM Centre, the company founded to fulfil EPMA visions of practical application of PPPM. He is member of the EPMA Board of Directors and associate editor of The EPMA Journal. His professional interests are focused on clinical laboratory diagnostics, vitamins, nutrition, innovation in healthcare, health-influencing factors, clinical data analyzing, quality management, development of clinical information systems, and PPPM.

Email: marko.kapalla@gmail.com

Title:
PPPM Centre in the heart of Europe: Call for collaboration

Authors:
Kapalla, M.*1, Kubáň, J.1, Labuda, P.2, Costigliola, V.3, Golubnitschaja, O.4,5,6

1Negentropic Systems, Ružomberok, Slovakia
2Department of Civil Law, University of Cologne, Germany
3European Medical Association, Brussels, Belgium
4Radiological Clinic, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
5Breast Cancer Research Centre, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
6Centre for Integrated Oncology, Cologne-Bonn, Rheinische Friedrich-Wilhelms-University of Bonn, Germany

*Corresponding author: Dr. Marko Kapalla

Abstract:

Key words:
Predictive preventive personalized medicine, Europe, global professional network, tele-medical approach, primary prevention, suboptimal health condition, healthcare, education, outlook

The paradigm shift from reactive to predictive, preventive and personalised medical approach in healthcare has been clearly justified and actively promoted by the EPMA during the last decade, since the Association has been created in 2009 [1]. Several fundamental documents have been published by the EPMA consortium demonstrating the “road-map” for the practical realisation of PPPM strategies [2-4]. Consequently, the PPPM Centre has been created as an instrument of EPMA.
for the practical realisation of the paradigm shift from “diseasecare” to “healthcare”; the activities of the PPPM Centre are planned to be focused on predictive diagnostics, primary prevention and personalised services to individuals in suboptimal health condition before a disease manifestation [5-10].

PPPM Centre is situated in “the heart of Europe”: Slovakia, in Liptov area, one of the most appreciated part by tourist and visitors of Žilina self-governing region [11]. The innovative vision of the PPPM Centre is strongly supported by the regional political representatives. Well-developed infrastructure provides great opportunities for utilising the local medical expertise on the one hand, and on the other hand for development the tele-medical approach by global EPMA network of experts, and it is highly attractive for international investment. The call is open for that now.

References:
Karlíková, Marie, RNDr., PhD.

Biography:
Dr. Karlíková graduated from the Charles University, Faculty of Natural Sciences, specialisation: Geology and geochemistry, in 1996. She took a PhD. degree at the Faculty of Natural Sciences, specialisation: Analytical chemistry, in 2003. She obtained several international scholarships, namely at the University Louis Pasteur in Strasbourg, France (degree: D.E.S.S., 1997), at the Karolinska Institute, Stockholm, Sweden (2000-1) and at the Ludwig-Maxmilian University, Munich, Germany (2001-2). Nowadays she works as a researcher and lecturer at the Department of Immochemistry Diagnostics of University Hospital Pilsen and the Faculty of Medicine in Pilsen. She is an author or co-author of 20 scientific articles. Citation index 64, H-index 3.

Title:
Plasma matrix metalloproteinases as biomarkers in colorectal carcinoma

Authors:
Karlíková, M.¹, Topolcan, O.¹, Kucera, R.¹, Karnos, V. jr.², Curilova, M.², Karnos, V.²
¹Department of Immochemistry Diagnostics
²Department of Surgery

University Hospital and Faculty of Medicine in Pilsen, Czech Republic

Abstract:
Matrix metalloproteinases (MMPs) are a family of zinc containing proteases that can cleave numerous substrates including collagens. Through their ability to degrade the extracellular matrix, MMPs are involved in cancer progression and metastasis. Significant increases particularly in MMP-2 and MMP-9 expression levels have been reported for many types of human cancer and cell culture and animal models of cancer, thus providing evidence for a strong association between MMP levels and cancer invasion or metastasis. Serum or plasma levels of different MMPs, mainly MMP-2, -7, -9, have been studied in relation with colorectal cancer, however the studies have brought conflicting results. The aim of our research was to assess preoperative plasma levels of 9 members of MMP family (MMP-1, -2, -3, -7, -8, -9, -10, -12, -13) in 80 colorectal cancer patients and compare them with 70 age-matched healthy subjects. In the pilot study, we found a significant increase in 8 out of 9 MMPs, namely MMP-1, -2, -3, -7, -8, -9, -10 and -12. From ROC curves, we calculated AUC parameters; the best AUC was found for MMP12 (0.7872), MMP10 (0.7500) and for MMP9 (0.7260). The highest sensitivities (at 90% specificity) were found for MMP10 (39.5%) and MMP2 (30.9%). Our results support the important role MMPs play in etiopathogenesis of colorectal carcinoma. We plan to perform further studies of selected MMPs (MMP-2, -9, -10).

Supported by Ministry of Health, Czech Republic - conceptual development of research organization (University Hospital in Pilsen - FNPI, 00669806).
Kinkorová, Judita, Ph.D., Associate Professor

Biography:
Judita Kinkorová is currently the manager of international research cooperation and affairs at University Hospital in Pilsen and Charles University, Faculty of Medicine in Pilsen. She is the manager of European project from FP7 focused on biobanking infrastructures, BBMRI-ERIC in Pilsen, and she is a manager of the hospital integrated biobank at University Hospital in Pilsen. Her main areas of interest are personalized medicine, biobanking and biomarkers. Currently she is involved in BRoTHER project (Biobank Research on Telemedical Approaches for Human Biobanks in a European Region), cross border bilateral project supported by a grant of the Bavarian-Czech Agency (BTHA), 2017-2019. Since 2019 she is a Regional Ambassador of ISBER (International Society for Biological and Environmental Repositories) for Europe and at the same time member of Relations committee ISBER, and also a member of program committee of ISBER Regional Meeting, Minneapolis, USA, 2019, and a member of ISBER Special Interest Group – Hospital Integrated Biorepositories. The author of 40 publications H-index 7.

Title:
BBMRI-ERC and ISBER two approaches in biobanking

Authors:
Kinkorova, J.
Department of Immunochemistry Diagnostics
University Hospital in Pilsen, Czech Republic

Abstract:
During last three decades biobanking has become an important source for scientific research. Biobanks are special facilities containing biological samples-usually-human biosamples and related data and information. Samples stored in biobanks serve researchers all over the world to solve both local and widely international health problems. That is why international collaboration and communication between biobanks worldwide is one of the basic characteristics of biobanking. Currently two international biobank entities BBMRI – ERIC (Biobanking and BioMolecular resource Research Infrastructure – European Research Infrastructure Consortium) and ISBER (International Society for Biological and Environmental Repositories) are leading bodies in biobanking. BBMRI is a European research infrastructure for biobanking getting together all the main actores in biobanking to boost biomedical research. BBMRI serves as a support and assistance for quality managenet services, ethical, legal, and social issues, and IT online tools to facilitate exchange of samples mainly in Europe. The current goal is to make the new treatment possible. ISBER is a global biobanking organisation which creates opportunities for networking, education, and innovations and harmonizes approaches to evolving challenges in biological and environmental repositories. The two different approaches will be discussed in the presentation.
Title:

Unstable atherosclerotic plaque and elevation of Lp-PLA2 as stroke predictors in patients with asymptomatic internal carotid artery stenosis

Authors:

Kopolovets, I.¹,², Berek, P.¹, Stefanić, P.¹, Sihotsky, V.¹, Boyko, N.²
¹Clinic of Vascular Surgery, Eastern Slovak Institute of Cardiovascular Diseases and Faculty of Medicine, Pavol Jozef Safarik University, Kosice, Slovak Republic
²Scientific Research and Educational Center of Molecular Microbiology and the Mucosal Immunology, Uzhhorod National University, Uzhhorod, Ukraine

Abstract:

The paper presents the formula “Stroke-Stop” which has been proposed to be used for the determination of the risk of developing stroke in patients with asymptomatic internal carotid artery (ICA) stenosis. The formula has been developed on the basis of mathematical calculation of the major risk factors for stroke: the degree of ICA stenosis, the morphological structure of the atherosclerotic plaque, the level of Lp-PLA2 concentration.

The study included 70 patients with atherosclerotic ICA stenosis. Among vascular inflammatory markers, lipoprotein-associated phospholipase A2 (Lp-PLA2) was determined. In the patients studied, the concentration of Lp-PLA2 was: 252.7-328.6 ng/ml.

The risk of stroke development increased in case of the progression of ICA stenosis and elevation of Lp-PLA2 levels. In patients with soft atherosclerotic plaque, the risk of stroke development was significantly higher as compared to patients with hard atherosclerotic plaque.

According to the given empirical scale, all the patients with soft atherosclerotic plaque (both symptomatic and asymptomatic ones), ICA stenosis greater than 70%, Lp-PLA2 concentration of more than 285 ng/l had the risk of stroke development of >100 points.

Patients with hard atherosclerotic plaque had a low and medium risk of stroke development. The proposed method for mathematical calculation of the risk index for the development of stroke using the formula “Stroke-Stop” may serve as an additional auxiliary criterion for the selection of patients with asymptomatic ICA stenosis for carotid endarterectomy.
Kozłowska, Klaudia, MSc, PhD student

Biography:
Klaudia Kozłowska is a PhD student at the Department of Biomedical Engineering of Wrocław University of Science and Technology where she teaches courses on computer science. She received two master’s degrees in the fields of Biomedical Engineering and Computer Science. She has just finished her PhD thesis “Investigations of gait and balance control and their changes in neurodegenerative diseases”. Her research interests concern biomedical signal analysis, specifically gait and balance control mechanisms in neurodegenerative and affective diseases, machine learning, and statistical methods applied to biomedical research. She is the author of 4 articles.

Title:
Home Monitoring of Patients with Parkinson’s Disease

Authors:
Kozłowska, K.1, Fojcik, K.1, Latka, M.1

1Department of Biomedical Engineering, Wrocław University of Science and Technology, Poland

Abstract:
Parkinson’s disease (PD) is a long-term neurodegenerative disorder that among others impairs the motor system. It affects an estimated 5 million individuals worldwide. As the population ages, the incidence and prevalence of PD are expected to increase exponentially with the number of patients reaching upwards of 40 million in the 2020s. PD imposes a considerable and growing burden on health care systems. Smartphones, wearable and internet technologies may facilitate development of cost-effective management systems that meet the patient’s needs that change as the diseases progresses. Currently PD pharmacotherapy is based on the biosynthetic precursor levodopa or other drugs which activate dopamine receptors. At early stages of PD, therapies are often successful but eventually most patients develop motor complications such as the abrupt loss of efficacy at the end of each dosing interval and dyskinesias. These complications necessitate frequent titration of medications which is difficult when based only on intermittent hospital monitoring. Herein, we present the first results of implementation of home monitoring system that enables quantification of the characteristic PD motor symptoms.
Kubíková, Tereza, Ph.D.

Biography:
took a Ph.D. degree in 2017 at Charles University, Faculty of Medicine in Pilsen with the doctoral thesis: “Histological composition and mechanical properties of aorta and pulmonary artery”. Nowadays, she works as an assistant of the Department of Histology and embryology at the Faculty of Medicine in Pilsen. She participates in research regarding bone healing and composition of vessels and their changes during AAA. She is an author of more than 25 articles in medical journals with more than 140 citations in available literature, H-index 6.

Title:
Histopathological alteration of abdominal aortic aneurysm; tissue expression of pentraxin-3, osteoprotegerin and hypoxia-inducible factor 1-alpha

Authors:
Kubíková, T.1, Tonar, Z.1, Tomášek, P.1, Hollan, I.2,3,4, Třeška, V.5, Moláček, J.5
1Department of Histology and Embryology and Biomedical Centre, Faculty of Medicine in Pilsen, Charles University, Pilsen, Czech Republic
2 Hospital for Rheumatic Diseases, Lillehammer, Norway
3Innlandet Hospital Trust, Department of Research, Innlandet Hospital Trust, Brumunddal, Norway
4Department of Medicine, Brigham and Women’s Hospital, Boston, USA
4Harvard Medical School, Boston, USA
5Department of Vascular Surgery, University Hospital in Pilsen, Faculty of Medicine in Pilsen, Charles University, Pilsen, Czech Republic

Abstract:
Background:
Complete etiopathogenesis of abdominal aortic aneurysm (AAA) is still. One of the aims is to find crucial structural changes in aneurysmatic wall and their reflection in serum. This would be beneficial not only for diagnostics, follow-up but also for potential therapeutic intervention. The aim of our study was to compare the expression of twelve proteins, structural components, and markers within the samples of AAA wall vs. non-aneurysmatic wall of subrenal abdominal aorta.

Methods:
63 formalin-fixed AAA tissue samples and nine non-AAA samples were histological processed. We quantified the area fractions of actin, desmin, elastin, collagen, and immunopositivity of the macrophages, neutrophils, T-lymphocytes, B-lymphocytes, hypoxia cells, pentraxin-3, and osteoprotegerin.

Results:
The data demonstrated that the AAA samples contained less actin, less desmin, less elastin and more collagen than the non-AAA samples. The AAA samples contained a greater fraction of macrophages,
neutrophils, T-lymphocytes, B-lymphocytes than the non-AAA samples. The AAA samples contained a greater fraction of hypoxic cells, a smaller fraction of osteoprotegerin-positive cells, and a greater fraction of PTX3-positive cells.

**Conclusion:**
The inflammatory reaction (neutrophils, macrophages, T-lymphocytes, B-lymphocytes) was associated with destruction of elastin, which was partially replaced by increased amounts of collagen. This remodeling of the AAA wall occurred under significant tissue hypoxia, despite containing a greater density of microvessels exceeding the normal density of vasa vasorum in non-aneurysmatic aorta. The PTX3 was upregulated in AAA, and its colocalization with the inflammatory infiltrate strongly support the present understanding of its role as a vascular-specific inflammatory marker.
Conclusion:
The inflammatory reaction (neutrophils, macrophages, T-lymphocytes, B-lymphocytes) was associated with destruction of elastin, which was partially replaced by increased amounts of collagen. This remodeling of the AAA wall occurred under significant tissue hypoxia, despite containing a greater density of microvessels exceeding the normal density of vasa vasorum in non-aneurysmatic aorta. The PTX3 was upregulated in AAA, and its colocalization with the inflammatory infiltrate strongly support the present understanding of its role as a vascular-specific inflammatory marker.

Title:
Prevention of the systemic somatic pathology based on the dental status findings

Authors:
Kubyshkina, K. P., Kunin, A. A.
Voronezh N. N. Burdenko State Medical University, Voronezh, Russia

Abstract:
The oral mucosa reflects the state of the body systems. Any minor changes in the oral mucosa to prevent of the systemic somatic pathology (dry, hyperemic, erosion and necrotic ulcers in oral mucosa; hypertrophy, cyanosis, swelling and bleeding of the gingival papillae; coated tongue or changes of its papillae), since symptoms of a systemic disease are manifested in the oral cavity earlier than anywhere in the body. That is why we assessed the state of the oral mucosa to identify general somatic pathology. 51 patients were examined, thirty of them (58.8%) – 13 males and 17 females (ages 20-43 years), had a common pathology. Verlgoj's diseases were diagnosed in 4 (13.3%) patients manifested hemorrhages in the oral cavity; 6 (20%) patients with acute leukemia manifested gingival papillae hypertrophy and ulcerative-necrotic lesions along the teeth closing line on the buccal mucosa; 4 (13.3%) patients with infectious mononucleosis manifested gum bleeding, petechial hemorrhages, catarrhal or ulcerative necrotic stomatitis and a grey coated tongue. Cyanosis of the oral mucosa, and teeth indentations on the buccal and lingual mucosa supported type II cardiovascular insufficiency in 7 (23.3%) people. Visceral candidiasis manifested as a white creamy coating on the tongue (11 (36.7%) patients). Exacerbation of chronic erosive gastritis was detected in 8 (26.7%) patients and manifested as swollen gingival papillae, yellowish coated tongue. Our observations prove the necessity of regular dental examinations to prevent and timely treat a somatic pathology on the basis of signs initially detected in the oral cavity in the absence of complaints of a systemic disease.
Kučera, Radek, Ph.D., Associate Professor

Biography:
Radek Kučera graduated from Charles University, Faculty of Pharmacy in Hradec Kralove in 1991 with the dissertation on the topic “Determination of digoxin using radioimunoanalytic methods”. He took a Ph.D. degree in 2011 at Charles University, Faculty of Medicine in Pilsen with the doctoral thesis: “Insuline like and other growth factors and tumors”. In January 2017 he finalized and defended his habilitation work on the topic “Insulin like growth factor I in theory and clinical practice” and took the degree of associate professor. Nowadays, he works as a vice head of the Department of Immunochemistry Diagnostics and teaches biochemistry at the Faculty of Medicine in Pilsen. He participates in research regarding hormones, growth factors and tumor markers. He is an author of more than 70 articles in medical journals with more than 200 citations in available literature, H-index 9.

Title:
How to establish reference ranges of the age and gender dependent biomarkers

Authors:
Kučera, R., Topolčan, O., Pecen, L.
Department of Immunochemistry Diagnostics, University Hospital in Pilsen, Czech Republic

Abstract:
Reference ranges as function of age and gender are very important for interpretation of biomarker results. It is generally known that establishment of the reference values in representative population by considering age and gender is the better accepted practice. Reference values are often connected with comparing different methods or different group of patients. We compared oncological patients with the group of healthy probands – a reference group. We decided to create a file of reference ranges of IGF1, IGFBP3 and IGF1/IGFBPP3 ratio for the adult Czech population across the age spectrum. We selected a group of 1022 healthy subjects, 467 males and 555 females (ages 20–98 years) from several regions in the Czech Republic. Serum levels of IGF1 and IGFBP3 were measured and the IGF1/IGFBP3 ratio was calculated. Subjects were divided into seven age-groups. Changes in the levels of observed analytes in each decade across the age spectrum were evaluated. All three parameters decreased in parallel with decrease in age: p<0.0001, r=−0.64, -0.35 and -0.54, respectively. The dynamics of the decline was different between males and females. Linear regression models with age as independent variable fitted by gender were tested. Non-parametric reference interval curves (medians and 2.5th–97.5th percentiles) as function of age by gender were also tested. Linear regression models seem to be more robust model as non-parametric approach. In conclusion, authors recommend using of a linear regression model based on reference values for IGF1, IGFBP3 and IGF1/IGFBP3 ratio and using of different reference ranges for age and genders.
IGF1, IGFBP3 and IGF1/IGFBP3 ratio and using different reference ranges for age and genders. Also tested.

Regression models with age as independent variable fitted by gender were tested. Non-parametric approach. In persons with hidden AH/PH media indicator CAVI was 6.34±0.52, while in group with normotension figure was 5.14±0.46, that is 23.2% greater (P < 0.05).

Conclusion:
Screening of RF among young people should be include assessment of CP. In the detection of hidden AH/PH is necessary to perform the determination of vascular stiffness to identify cases of vascular remodeling, despite the normal pressure on the shoulder. This approach will contribute to more effective formation groups of cardiovascular risk for subsequent inclusion carriers of hidden AH/PH in preventive angioprotective programs.

Kudryavtseva, Victoria, Clinical Intern

Biography:
Victoria Kudryavtseva graduated Faculty of General Medicine in Stavropol State Medical University, Stavropol (Russia) in 2017. Then she started clinical internship. The primary specialization is internal medicine. Victoria has published 6 print works, has been accepted with 3 posters in cities Rostov-on-Don, Moscow, Vilnius. As part of the Student Health Center was won 2 grands. Her area of interest includes early vascular aging, correction of risk factors in young age, prehypertension, pre-clinical diagnosis atherosclerosis and preventive health care.

Title:
Screening of Youth Vascular Health and Role of Modern Diagnostic Technologies

Authors:
Kudryavtseva, V., Evseyeva, M.
Stavropol State Medical University, Russian Federation

Abstract:

Background:
Arterial hypertension/prehypertension (AH/PH) is admitted risk factor (RF). However, isolated form of AH/PH in the aorta or hidden AH/PH are not detected by traditional method. And it is not yet known how it affects on restructuring of vascular wall.

Purpose:
To assess the occurrence of hidden AH/PH among young people and determine status of arterial wall at this variant of increasing pressure.

Material and methods:
In process of RF screening in 217 students also carried out study of parameters of CP in comparison with peripheral pressure (PP) using diagnostic complex BPLab Vasotens (Peter Telegin, Russia). Due the comparison of indicators of CP and PP was possible to distinguish different types of AH/PH. Then in carriers of hidden AH/PH was studied arterial wall using VaSera-1500 device (Fucuda Densia, Japan), which allows to estimate cardio-ankle vascular index (CAVI). Data were processed using statistical software package Microsoft Excel 2016.

Results:
Comparison of PP and CP revealed hidden AH/PH in 18.5%, which is impossible to detect by traditional method. In persons with hidden AH/PH media indicator CAVI was 6.34±0.52, while in group with normotension figure was 5.14±0.46, that is 23.2% greater (P < 0.05).

Conclusion:
Screening of RF among young people should be include assessment of CP. In the detection of hidden AH/PH is necessary to perform the determination of vascular stiffness to identify cases of vascular remodeling, despite the normal pressure on the shoulder. This approach will contribute to more effective formation groups of cardiovascular risk for subsequent inclusion carriers of hidden AH/PH in preventive angioprotective programs.
Kunin, Anatoly A., Doctor of Medical Sciences, Professor

Biography:
Voronezh N.N. Burdenko State Medical University, Russia

Anatoly A. Kunin graduated from Voronezh State Medical Institute named after N.N. Burdenko in 1966. She took a Ph.D. degree in 1970 on the following topic: “Dental diagnosis of some precancerous diseases and cancer of the oral mucosa and the red border of the lips”. In 1991, he defended his doctoral dissertation on the topic: “Diagnosis, clinic, treatment and medical examination of patients with chronic diseases of the oral mucosa and red border of the lips, accompanied by keratinization of the epithelium”. From 1992 till 2013 - Head of the Therapeutic Dentistry Department of VSMA named after N.N. Burdenko. Nowadays, he works as a Professor at the Department of Hospital Dentistry of Voronezh State Medical University named after N.N. Burdenko. Academician of the Russian Laser Academy of Sciences, International Academy of Dentistry, International Academy of Authors of Scientific Inventions and Discoveries. In 2006, he was awarded the National Recognition Award for the faculty of dental faculties of Russia. Since 2012 till nowadays – the Head of the European Dentistry Department for Predictive, Preventive and Personalized Dentistry (DPPPD) under the EPMA. In 2013, by the decision of the Russian Academy of Natural Sciences, the Honorary title “Founder of a scientific school” was awarded. Author / co-author of more than 850 publications (6 monographs, 36 teaching aids) including international level. Under the guidance of Professor A.A. Kunin defended 59 Ph.D. and 8 Dr.Med.Sc. dissertations. H-index 36.

Title:
The DPPPD-EPMA conception in predictive, preventive and personalized dentistry

Authors:
Kunin, A. A.¹, Moiseeva, N. S.², Ippolitov, Yu. A.³
¹Department of Hospital Dentistry
²Department of Oral and Maxillofacial Surgery
³Department of Pediatric Dentistry
Voronezh N.N. Burdenko State Medical University, Russia

Abstract:
In 2012, in the framework of the bilateral cooperation agreement between the VSMU named after N.N. Burdenko and the European Association for Predictive, Preventive and Personalized Medicine (ERMA, Brussels, Belgium) the European Dentistry Department (DPPPD-EPMA) has been organized, which brings together leading professors, doctors of medical science and specialists in preventive dentistry from Italy, Germany, Russia, Estonia, the USA, Turkey and Moldova. During the 7 years’ period of international scientific cooperation more than 23 research papers, review articles and abstracts have been published in the rating specialized EPMA Journal published by Springer, which indexed in the Scopus database on the following topics: prevention and personalized treatment in dentistry, in particular, prevention and treatment of dental caries and non-carious diseases, as well as periodontal and oral mucosa diseases. During this period, 7 master classes were held in Germany.
(105 doctors were trained), 2 - in the Baltic States, 2 - in Azerbaijan (200 doctors were trained), 2 - in Turkey, which allowed the implementation of a scientific approach to prevention of the most popular methods in these countries. The results of scientific research were high-technological approaches to the diagnosis and treatment of diabetes, its correlation with periodontal diseases, as well as Sjogren syndrome (the USA), social aspects of caries prevention (Estonia), personalized approaches to the periodontal diseases prevention (Italy; Russia), personalized approaches to the detection and prevention of Flammer syndrome (Germany). For the secondary caries prevention and preventive therapy, personalized approaches to the treatment and prevention of dental caries were introduced at the international level with the help of modified dental filling materials and toothpastes with an electromagnetic field (priority patent reference RF 2018145440); as well as methods for initial caries detection (priority patent reference RF 2019116126) and light and diode methods for periodontal and oral mucosa diseases prevention. Such a scientific approach to the organization of dentistry prevention made it possible, under medical examinations, to obtain a reduction of caries up to 98% (Russia). The experience of the DPPPD-EPMA Department clearly shows the necessity for a scientific approach to prevention to improve the quality results in modern conditions.

Title:

Modern achievements in caries prevention

Authors:
Kunin, A. A.1, Lukyanovich, P. A.1, Moiseeva, N. S.3, Kunin, D. A.4

1Department of Mathematical Physics, Voronezh State University, Voronezh, Russia
2Department of Hospital Dentistry
3Department of Oral and Maxillofacial Surgery, Voronezh N.N. Burdenko State Medical University, Voronezh, Russia
4Director of the medical center OOO “Health City”, Voronezh, Russia

Abstract:

It was substantiated the connection between the phototherapeutic effect and the response to a temporary suspension of ATP production during light stimulation. The obtained and then refined optimal parameters of therapeutic optical pulsed radiation near 625 nm were repeatedly confirmed. Optical spectra of biological action on cells have a pronounced peak of 620-630 nm, however, the maximum effect is observed near 760 nm. Note that in solar radiation, the last component is strongly suppressed on the Earth’s surface due to absorption by atmospheric oxygen. The main primary process leading to the suspension of ATP production is the release of active oxygen forms when light is absorbed by cytochrome oxidase. Therefore, the increased response to radiation of 760 nm is probably related to the relatively lesser adaptation of cells to the production of native antioxidases for quenching the released active oxygen forms. Taking into account all the mentioned above, we have assumed a multiple decrease in the optimal intensity of therapeutic radiation of 760 nm compared with 625 nm. In this regard, for the prevention of caries, optical radiation of 760 nm (FWHM - 26 nm), 76 Hz, duty cycle - 23%, 11 mW / cm2 a special device was used. 112 patients with a sub compensated form of caries had all their teeth filled. Caries prevention therapy was used 3 times for 52 patients, and after half a year and a year no caries were detected (including oral hygiene, rinsing, diet), and 50 patients without exposure to light six months later had 2 cavities and a year later 2 ones more.
Kupets, Tatiana

Biography:
Tatiana Kupets graduated from Moscow State Pedagogical University in 1989 with a diploma in biology, chemistry and pedagogy, followed by a specialization in human and animal physiology.

After she graduated, she worked at the Research Institute of Normal Physiology at the Russian Academy of Medical Sciences researching the role of insulin in behavior and cognitive functions. From 1995 to 1998, she was employed by Colgate-Palmolive as part of its educational program. For the following few years, she was involved in executing oral health projects supported by different companies (Wrigley, DenMat, J&J, etc.). Since 2006, she has been a teacher in «Dental College №1».

From 2004, she has been the head of scientific department of R.O.C.S.® Oral Care Products and is a co-holder of several patents.

She is a member of the Professional Society of Dental Hygienists in Russia, the Russian Periodontal Association and the National Academy of Aesthetic Dentistry.

Title:
Clinical effectiveness evaluation of remineralization therapy in children with oncology disorders undergoing chemotherapy

Authors:
Kupets, T., Vinnichenko, Y., Alexandrova, O., Matelo, S.

1 Central Research Institute of Dental and Maxillofacial Surgery
2 WDS Laboratory
Moscow, Russia

Abstract:
Cancer chemotherapy can increase the risks of dental diseases, which calls for enhanced preventive methods. Three different products were tested and compared to select the most effective for these particular conditions.

Osteosarcoma and Ewing's sarcoma patients admitted in Blokhin National Medical Research Center of Oncology in September – December, 2016, were offered to participate in the caries prevention program while undergoing chemotherapy. 115 children aged 12-17 signed up and randomly joined groups 1-3. Refusers formed the control group (4).

Group 1 used a remineralizing gel containing Xylitol and Calcium Glycerophosphate. Group 2 used a dental cream containing Casein Phosphopeptides - Amorphous Calcium Phosphate (CPP-ACP). Group 3, a 5% sodium fluoride liquid compound. Group 4 used no special caries prophylaxis method. All participants were instructed on proper toothbrushing techniques.

The average baseline DMFT for the 4 groups range from 4.04 to 4.48 with no significant difference. After 12 months, groups 1 and 4 (p=0.0017), 2 and 4 (p=0.005), 3 and 4 (p= p=0.009), 1 and 3 (p=0.009) showed significant statistical differences in DMFT values. No significant statistical differences (p>0.05) were found for groups 1 and 2, 2 and 3.

As a result of the prophylaxis undertaken, groups 1, 2, and 3, achieved a reduction in caries increment of 67.7%, 52.3% and 46.2%, respectively, compared to the control group.

It follows that the Xylitol and Calcium Glycerophosphate containing gel is more effective in dental caries prophylaxis in children undergoing cancer chemotherapy compared to both the CPP-ACP, and the 5% sodium fluoride, containing products.
Clinical effectiveness evaluation of remineralization therapy in children with oncology

Title:
Systematic analyses reveal long non-coding RNA (PTAF)-mediated promotion of EMT and invasion-metastasis in serous ovarian cancer

Authors:
Liang, H.

Department of Pharmacology (State-Province Key Laboratories of Biomedicine-Pharmaceutics of China, Key Laboratory of Cardiovascular Research, Ministry of Education), College of Pharmacy, Harbin Medical University, Harbin, China.

Abstract:
A deeper mechanistic understanding of epithelial-to-mesenchymal transition (EMT) regulation is needed to improve current anti-metastasis strategies in ovarian cancer (OvCa). Here, by systematically analyzing high-throughput gene expression profiles of both IncRNAs and protein-coding genes in OvCa samples with integrated epithelial (iE) subtype and integrated mesenchymal (iM) subtype labels, we identified a lncRNA-mediated competing endogenous RNA (ceRNA) regulatory network that affects the expression of many EMT-related protein-coding genes in mesenchymal OvCa. Using a combination of in vitro and in vivo studies, we provide evidence that the lncRNA PTAF-miR-25-SNAI2 axis controls EMT in OvCa. Our results revealed that up-regulated PTAF induced elevated SNAI2 expression by competitively binding to miR-25, which in turn promoted OvCa cell EMT and invasion. Moreover, we found that silencing of PTAF inhibited tumor progression and metastasis in an orthotopic mouse model of OvCa. We then observed a significant correlation between PTAF expression and EMT markers in OvCa patients. These findings suggest that the lncRNA PTAF, a mediator of TGF-β signaling, could predispose OvCa patients to metastases and may serve as a potential target for anti-metastatic therapies for mesenchymal OvCa patients.

Liang, Haihai, Professor

Biography:
Prof. Haihai Liang has been engaged in the study of non-coding RNAs and pathogenesis and prevention of fibrotic disease and cancer. Prof. Liang is committed to the search for novel therapeutic targets by exploring molecular mechanism of fibrosis using microarray, molecular biology, bioinformatics techniques via in vivo and in vitro models. As first author or corresponding author, Prof. Haihai Liang has published 21 papers on the famous international journals, such as Cell Death and Differentiation, Molecular Therapy, and so on. The total impact factor is 120. He has received several research grants including two National Natural Scientific Founding and has been involved in four national major projects. He is honored three provincial and ministerial achievement awards.

Title:
Systematic analyses reveal long non-coding RNA (PTAF)-mediated promotion of EMT and invasion-metastasis in serous ovarian cancer

Authors:
Liang, H.

Department of Pharmacology (State-Province Key Laboratories of Biomedicine-Pharmaceutics of China, Key Laboratory of Cardiovascular Research, Ministry of Education), College of Pharmacy, Harbin Medical University, Harbin, China.

Abstract:
A deeper mechanistic understanding of epithelial-to-mesenchymal transition (EMT) regulation is needed to improve current anti-metastasis strategies in ovarian cancer (OvCa). Here, by systematically analyzing high-throughput gene expression profiles of both IncRNAs and protein-coding genes in OvCa samples with integrated epithelial (iE) subtype and integrated mesenchymal (iM) subtype labels, we identified a lncRNA-mediated competing endogenous RNA (ceRNA) regulatory network that affects the expression of many EMT-related protein-coding genes in mesenchymal OvCa. Using a combination of in vitro and in vivo studies, we provide evidence that the lncRNA PTAF-miR-25-SNAI2 axis controls EMT in OvCa. Our results revealed that up-regulated PTAF induced elevated SNAI2 expression by competitively binding to miR-25, which in turn promoted OvCa cell EMT and invasion. Moreover, we found that silencing of PTAF inhibited tumor progression and metastasis in an orthotopic mouse model of OvCa. We then observed a significant correlation between PTAF expression and EMT markers in OvCa patients. These findings suggest that the lncRNA PTAF, a mediator of TGF-β signaling, could predispose OvCa patients to metastases and may serve as a potential target for anti-metastatic therapies for mesenchymal OvCa patients.
Loboda, Ekaterina, Assistant professor

Biography:
Loboda Ekaterina graduated from Academician I.P. Pavlov First State Medical University, Faculty of Dentistry in Saint-Petersburg, Russia in 2005. She has finished internship in 2006 and residency in general dentistry, therapeutic dentistry in 2008. She took a Ph.D. degree in 2010 with her thesis on the topic "Justification of the preventive program of periodontal diseases in young people with deforming dorsopathies." She currently works as an assistant professor in the Department of Therapeutic Dentistry and Periodontology and as a dentist in City Periodontal Center “PAKS” Ltd. She currently works as an assistant in the Department of Therapeutic Dentistry and Periodontology. She participates in research regarding relationship between general health and oral health since 2006 and is an author of more than 40 articles and abstracts in medical journals and abstract digests.

Title:
Justification of a personalized approach at the stages of conservative initial and supportive periodontal therapy.

Authors:
Loboda, E.1.2, Kudryavtseva, T.1, Atrashkevich, V.3, Berezkina, I.1

1Department of therapeutic dentistry and periodontology of Federal State Budgetary Educational Institution of Higher Education «Academician I.P. Pavlov First St. Petersburg State Medical University» of the Ministry of Healthcare of Russian Federation.
2City Periodontal Center «PAKS» Ltd., Saint-Petersburg, Russian Federation
3A.I. Yevdokimov Moscow State University of Medicine and Dentistry, The Health Ministry of Russian Federation

Abstract:
One of the reasons for chronic periodontal deceases is long-term presence of pathogenic microflora without appropriate body’s reaction. There are a lot of difficulties in choosing a therapy because of microorganisms diversity, their drug resistance, side effects, allergic reactions to antibiotics. Algorithm’s creation for choosing of effective antimicrobial and anti-inflammatory exposure to a body and periodontal microflora in all stages of periodontal treatment based on personal intervals of supporting periodontal therapy is very important as a practical matter. 60 patients of both sexes having slight and moderate severe of periodontal diseases took part in the study. The average age is 46.33±1.02 years. A standard set of diagnostic and therapeutical procedures was held additionally included microbiological research and Doppler ultrasound after and before treatment. 3 group of patients were observed. In first group standard basic therapy was held as mono-therapy. In second group FDT was held in addition to standard treatment. In third group FDT and submucosa injection of hyaluronic acid were held in addition to standard treatment. Control of treatment’s results was implemented through 1,3 and 6 month. There was improvement of main periodontal index, index of periodontal vessel’s Doppler ultrasound in each of 3 groups, p≤0.05. The level of indexes twice as high in second and third groups as these in the first. These results was saved for 3 month. Using FDT and hyaluronic acid at every stage of treatment of periodontal diseases help to decrease the number of relapses, because clinical effect is confirmed by researches and results remain during specified time.
Macanova, Tereza, Mgr.

Biography:
I graduated from University of West Bohemia in Pilsen in 2017. Then I joined the Department of Biology at the Faculty of Medicine, Charles University in Pilsen, where I currently work on my PhD degree. My field of interest is mainly molecular biology of cancer. In laboratory, I work with FFPE tissue and cell lines mostly. Among other things, I teach Biology and Genetics.

terea.macanova@lfp.cuni.cz

Title:
Angiogenesis activation in tissue of liver metastases of colorectal carcinoma

Authors:
Macanova, T.1, Maleckova, A.2, Polivka, J.2, Tonar, Z.2, Daum, O.3, Pesta, M.1
1Department of Biology, Faculty of Medicine in Pilsen, Charles University
2Department of Anatomy, Histology and Embryology, Faculty of Medicine in Pilsen, Charles University
3Department of Patology, Faculty of Medicine in Pilsen, Charles University

Czech Republic

Abstract:
The cancer treatment of most solid tumors is chemotherapy - other possibility is biological treatment - targeted angiogenesis inhibiting. One of the aims of this research was to find new angiogenesis target molecules and to determine the expression of genes, whose products are involved in the activation of angiogenesis in the tissue of liver metastases of CRC. We have attempted to identify these molecules in signaling pathways that activate angiogenesis - we focused on VHL/HIF, RTK/MAPK and PI3K/Akt/mTOR pathways. Then we compared different types of the tumor tissue (tumor – transient - normal tissue).

For the analysis of angiogenic pathways, a method for assessing gene expression at the mRNA level was used. The analysis was performed retrospectively and FFPE tissue of liver metastases of CRC was used as the source of the tissue. Gene expression was assessed by reverse transcription followed by real-time PCR (RT real-time PCR).

When comparing the expression between tumor and transient tissue of liver metastases of CRC, we found statistically significantly higher expression of HIF2α, mTOR, EGFR, FOSrn, FOS129, KDR in the transient tissue and a statistically significant reduction of the VHL tumor suppressor gene. These results indicate greater involvement of angiogenesis signaling pathways in transient tissue than in the tumor center. A similar result was shown by the immunohistochemical determination of expression of the CD34 molecule as a marker of endothelial cells.
Malakhovskiy, Vladimir, PhD, Professor

Biography:
Vladimir Malakhovskiy graduated from Moscow Medical Academy named after I.M. Sechenov, Faculty of Medicine. Nowadays, he works as a professor of the Integrative medicine department First Moscow State Medical University named after I.M. Sechenov (Sechenov University) and as professor of the Scientific and Practical Centre of traditional medical systems First Moscow State Medical University named after I.M. Sechenov (Sechenov University). Area of professional interests: rehabilitation of patients, suffering from psycho-emotional disorders, and suffering from chronic pain. He is an author of more than 135 articles and abstracts in medical journals.

Monasipova, Liliya

Biography:
Liliya Monasipova graduated from Tashkent Pediatric Medical Institute in 1996. She graduated from the internship with the specialty “Child Psychiatry” in 1997. From 1997 to 2008 she worked as a psychiatrist in the Clinical psychiatric hospital in Tashkent, from 2002 - as head of the department. From 2008 to 2011 she studied for a PhD in the Serbsky National Research Center for Social and Forensic Psychiatry, Moscow, Russia. In 2012 she defended her thesis. In 2014 she had professional development course in “Psychotherapy” at the Russian University of Peoples' Friendship (Moscow). She drew attention to the great potential of Ayurveda in the treatment of patients with mental illness. Since 2018 she has been working as Assistant at the Scientific and practical centre of traditional medical systems of Sechenov University. Her fields of interests are personalized approach in psychotherapy, traditional medical systems, Ayurveda.
Title:

Personalized treatment of anxiety disorders

Authors:

Malakhovskiy, V.,¹ Monasipova, L.¹

¹The First Moscow State Medical University named after I.M. Sechenov (Sechenov University), Moscow, Russia

Abstract:

The report highlights the possibilities of a personalized approach in the choosing of psychotherapeutic methods in the treatment of patients with anxiety disorders.

High appealability of patients with anxiety disorders to private clinics, indicates the need to improve the existing treatment regimens to increase their effectiveness.

The traditional medical system Ayurveda is based on a constitutional approach, it provides predictability, personalized treatment and includes effective preventive programs.

A protocol for the treatment of anxiety disorders based on the personalized approach of traditional medical system Ayurveda combined with an assessment of the dominant representative patient systems had been developed by us.

It includes: the use of individually selected psychotherapeutic programs, as well as recommendations on diet and lifestyle. Techniques of psychotherapy are selected based on Prakriti (the innate individual constitution of the person), the type of psychic constitution (the predominance of Satva, Rajas or Tamas) and the assessment of the dominant representative system of a person (auditory, visual, kinesthetic).

The cultural characteristics of the patient were also taken into account, therefore, the westerners (cognitive-behavioral psychotherapy, existential psychotherapy, art therapy) and Eastern techniques were included in the protocol.

43 patients were diagnosed, treated, and examined at the follow-up stage.

Preliminary results show that a personalized approach can improve the effectiveness of treatment, provides reliable compliance, and provides secondary prevention of anxiety disorders.
Malečková, Anna, M.D.

Biography:
Department of Histology and Embryology, Faculty of Medicine in Pilsen, Charles University. Anna Malečková graduated from Charles University, Faculty of Medicine in Pilsen in 2017. She is currently a Ph.D. student at the Department of Histology and Embryology, Faculty of Medicine in Pilsen, Charles University. Her thesis is focused on histological analysis of experimental models of liver diseases. She specializes in quantitative histology of liver of different species, mostly pigs. In 2016, she received a scientific prize for students from the foundation “Nadání Josefa, Marie a Zdeňky Hlávkových”. Since 2015, she has been teaching histology at the Faculty of Medicine in Pilsen, Charles University. According to WoS, she co-authored 5 publications, h-index 2.
anna.maleckova@lfp.cuni.cz

Title:
Experimental liver modeling as a tool for individualized management of metastatic colorectal cancer patients and patients with other liver pathologies

Authors:
Malečková, A.1, 2, Mik, P.2, 3, Liška, V.2, 4, Pálek, R.2, 4, Witter, K.5, Králičková, M.1, 2, Tonar, Z.1, 2
1Department of Histology and Embryology, Faculty of Medicine in Pilsen, Charles University, Czech Republic
2Biomedical Center, Faculty of Medicine in Pilsen, Charles University, Czech Republic
3Department of Anatomy, Faculty of Medicine in Pilsen, Charles University, Czech Republic
4Department of Surgery, University Hospital, Czech Republic
5Institute of Anatomy, Histology and Embryology, Department for Pathobiology, University of Veterinary Medicine Vienna, Austria

Abstract:
Introduction:
Domestic pig is common large animal model in biomedicine thanks to its morphological and physiological similarities with humans. Porcine liver might be used in studies of liver regeneration after partial liver resection for metastatic colorectal cancer (CRCA) or in studies of chemotherapy-induced hepatotoxicity. Nevertheless, the porcine liver has not yet been sufficiently described in terms of its microscopic morphology.

Aims:
To quantitatively describe the porcine microvascular and biliary tree and to show the relation between the microvascular tree architectonics and distribution of connective tissue and hepatocytes in pigs.
Methods:
36 tissue probes, representing six hepatic lobes and three different positions relative to the hepatic circulation (peripheral, paracaval and paraportal region), were obtained from 7 healthy Prestice Black-Pied pigs. The length density of microvessels LV (vessels) and bile ducts LV (ducts) was estimated using the stereological methods.

Results:
LV (vessels) was lower in the periphery (mean 807 mm/mm³, SD 132) than in the paracaval (mean 942 mm/mm³, SD 136.7) and periportal (mean 918 mm/mm³, SD 124.4) regions (Mann-Whitney U-test, p < 0.001). LV (ducts) was lower in the periphery (mean 3451 mm/mm³, SD 553) than in periportal (mean 3681 mm/mm³, SD 599) region (Mann-Whitney U-test, p < 0.05). There was a weak correlation between LV (vessels) and volume and number of hepatocytes (Spearman correlation coefficient, -0.13 and 0.19).

Conclusion:
Porcine liver periphery shows significant differences when compared to other regions relative to hepatic circulation. The variability within porcine liver needs to be taken into consideration when evaluating experiments e.g. on liver regeneration. Quantitative description of the structural parameters will allow precise planning of such experiments.
Mayer Jr., Otto, M.D., Ph.D., Professor

Biography:
Otto Mayer graduated from Charles University, Medical Faculty in Pilsen in 1993. He took a Ph.D. degree in 1999 at Charles University in Prague (with the doctoral thesis: “Changes in mortality and coronary risk after 1989 in Western Bohemia population”). In 2005 he took the degree of associate professor (with habilitation work “Homocystein as a risk factor of vascular diseases”) and in 2018 was appointed full professor of internal medicine. Nowadays, he works as a head of the intensive care unit on 2nd Department of Internal Medicine of University Hospital and Faculty of Medicine in Pilsen. His main research topics are epidemiology of cardiovascular disease, mainly in the area of secondary prevention of vascular diseases, research in the field of biomarkers of cardiovascular risk and mechanical properties of large arteries. He is an author of more than 100 original research reports, with about 1100 citations and H-index 19.

Title:
Vitamin K status independently influenced individual course of age-dependent arterial stiffening.

Authors:
Mayer, O.1, Gelžinský, J.1, Seidlerová, J.1, Mateřánková, M.1, Mareš, S.1, Svobodová, V.1, Kučera, R.2, Topolčan, O.2, Cifková, R.3, Vermeer, C.4, Filipovský, J.1
12nd Department of Internal Medicine, Medical Faculty of Charles University and University Hospital, Pilsen, Czech Republic
2Department of Immunochemistry Diagnostics
3Centre for Cardiovascular Prevention of the First Faculty of Medicine, Charles University and Thomayer’s Hospital, Prague, Czech Republic
4R&D Group VitaK, Maastricht University, The Netherlands

Abstract:
Matrix Gla protein (MGP) is a natural inhibitor of tissue (vascular) calcification. Vitamin K is the essential cofactor for MGP maturation, while plasma concentration of dephosphorylated-uncarboxylated isoform of MGP (dp-ucMGP) well-reflects the status of this vitamin. In previous cross-sectional study we observed that increased plasma dp-ucMGP concentration was independently associated with increased stiffness of the large arteries, quantified as aortic pulse wave velocity (aPWV). We investigated whether there is also any association between dp-ucMGP and individual aPWV increase over time.

In total 541 population-based subjects (mean age 53.9 years, 45.2% males) were followed in a prospective cohort study (median time of follow-up was 8.0 years). Mean intra-individual increase of aPWV during follow-up was 1.45 (±2.02) m/sec and was positively associated with baseline dp-ucMGP concentration- the aPWV differences [follow-up minus baseline aPWV] per year of follow-up (∆PWV/year) across dp-ucMGP quintiles were 0.14(±0.22), 0.17(±0.22), 0.20(±0.25), 0.20(±0.27) and
0.21(±0.21) m/sec in 1st-5th quintile, resp.; p=0.019 (adjusted for age, gender, mean arterial pressure) The positive association between dp-ucMGP and ΔPWV/year remained significant also in continuous manner and if fully adjusted for potential confounders by multiple linear regression. Moreover, baseline concentration of dp-ucMGP < 357 pmol/L (1st quintile), reflecting high vitamin K status, was associated with about 40% lower relative risk of ΔPWV per year ≥ 0.2 m/sec (twice higher expectable “secular” age-dependent increase) [fully adjusted odds ratio was 0.57 (95%CI: 0.35-0.92, p=0.021].

In conclusion, high vitamin K status (reflected by low dp-ucMGP) seems to be protective against accelerated age-dependent vascular stiffening in general population.

[The present study was supported by Health Development Agency of Czech Ministry of Health (project 15-27109), by Charles University Research Fund (PROGRES, project Q39) and by IDS Plc., Boldon, UK]
Merglova, Vlasta, PhD., Assoc. Prof.

Biography:
Assoc. Prof. Vlasta Merglova, PhD. finished her studies of dentistry at the Faculty of Medicine in Pilsen, Charles University in 1976. Since 1976 she has been working at the Dentistry Department, the Faculty of Medicine in Pilsen. In 1979 she graduated in dentistry and five years later in paediatric dentistry. PhD postgraduate study she finished in 1989 and in 2000 she received associate professor degree. V. Merglova is currently the head of paediatric dentistry at University Hospital in Pilsen, the president of the Czech Society for Paediatric Dentistry, the representative of the Czech Republic in the European Academy of Paediatric Dentistry and the member of the International Association of Paediatric Dentistry. She is the author or co-author of 53 articles in dental and medical journals with 135 citations and with h-index 5.

Title:
Personalized paediatric dentistry – caries risk assessment

Authors:
Merglova, V., Hauer, L., Koberova – Ivancakova, R.

1Department of Dentistry, University Hospital and Faculty of Medicine in Pilsen, Charles University, Czech Republic
2Department of Dentistry, University Hospital and Faculty of Medicine in Hradec Kralove, Charles University, Czech Republic

Abstract:

Objectives:
Caries risk assessment is a diagnostic tool for identification those children who are at the greatest risk of future dental caries and for individualized prevention and treatment.

Material and Method:
A cross-sectional study was carried out with 116 one-year old infants. Mothers of these infants were informed during pregnancy and consequently 6 months after delivery about prevention of early childhood caries. Following data from infant’s history were recorded: presence of systemic diseases, occurrence of fevers, antibiotics administration, bad nutritional habits and oral hygiene practices. Developmental anomalies and the presence of pathological conditions in oral cavity were recorded during examination and saliva samples were taken for Streptococcus mutans (SM) screening. The descriptive statistics were used for evaluation.

Results:
Systemic diseases were present in 15 (12.9%) infants. 39 (33.6%) infants had fevers in anamnesis and 28 (21.6%) were treated by antibiotics. Continuous night breastfeeding has been still practised in 25 (21.6%) infants and 29 (25%) have had prolonged consumption of sugar drinks from baby – bottle. Oral hygiene has not been so far introduced in 17 (14.7%) infants. Intraoral developmental anomalies and pathological conditions were found in 10 infants (8.6%). Risk salivary SM levels were present in 26 infants (22.4%).

Conclusion:
Lots of dental caries risk factors were recorded in the cohort of infants. The prolonged consumption of sweet drinks from baby bottle was the most frequent risk factor. This risk factor should not be present in infants of well informed parents.

Supported by a grant from the Ministry of Health of the Czech Republic – Conceptual Development of Research Organization Faculty Hospital in Pilsen – FNPI, 00669806.
Mírka, Hynek, M.D., Ph.D., Assoc. Prof.

Biography:
Hynek Mírka graduated from Charles University in Prague, Medical School in Pilsen in 1995. He took a Ph.D. in 2006 with thesis: “Value of HRCT in the diagnostics of pulmonary complications of malignant haematologic diseases.” In 2018 he defended habilitation work on the topic “Imaging of molecules distribution in tissue as a biomarker of pathological conditions” and took the degree of associate professor. Nowadays, he works as a vice head for teaching and research at the Department of Imaging Methods of Medical School and Teaching Hospital in Pilsen. He specializes in advanced imaging methods with emphasis on oncological diagnostics and diagnostics of liver and lung diseases. He is an author or co-author of 151 articles in medical journals with 160 citations in available literature, author of 1 textbook and 6 chapters in textbooks, H-index 6.

Title:
Contrast enhanced ultrasound in detection of the endoleak: a possible role in personalized approach to the follow-up after endovascular repair of the abdominal aneurysm

Authors:
Mírka, H., Korčáková, E., Duras, P., Houdek, K., Moláček, J.

Departments of:
1 Imaging Methods
2 Surgery, Medical School and Teaching Hospital Pilsen, Charles University in Prague, Pilsen, Czech Republic
3 Biomedical Centre, Faculty of Medicine in Pilsen, Charles University in Prague, Pilsen, Czech Republic

Abstract:
Objective:
Verification of practical use of contrast-enhanced ultrasonography (CEUS) in monitoring the patients after implantation of aortic stent-graft.

Material and method:
62 paired examinations using ultrasonography and CT angiography (CTA) were carried out in 28 patients (24 men, 4 women, mean age 74 years) with endovascular abdominal aortic aneurysm repair in our medical centre in the course of 1.5 year. In B-mode, we measured diameter of aneurysmal sac in laterolateral and anteroposterior direction. After injection of contrast agent we evaluated occurrence of endoleaks and their types.

Results:
In measuring abdominal aortic aneurysm sac dimensions, the ultrasound shows tendency to underestimation, that was lower in transverse, but the difference was statistically insignificant in both of them (p < 0.0001). Endoleaks have been correctly detected in 29 cases (sensitivity 90.9 % and specificity 100 %). The endoleak type has been correctly detected in 27 cases (sensitivity 84.9 % and...
reliability 93.3 %). In the evaluation of whether endoleak occurrence and also its type have been correctly determined, compliance has been achieved in 57 cases (accuracy 91.94 %).

**Conclusion:**
Being aware of limitations, CEUS can be used as part of the diagnostic algorithm to monitor patients after EVAR and personalised decision making about treatment of complications. CT angiography is considered indispensable in unclear findings or in cases which constitute potential indication for surgery or which CEUS results do not correlate with the clinical finding.

**Title:**
**A personalized approach to differential diagnostics in imaging of peripheral lung adenocarcinoma**

**Authors:**
Mírka, H.1,6, Ferda, J.1, Krákorová, G.2, Vodička, J.3, Mukenšnabl, P.4, Topolčan, O.5, Kučera, R.5

**Departments of:**
1 Imaging Methods
2 Pneumology and Fibroscopy
3 Surgery
4 Šikl’s Institute of the Pathological Anatomy and division of:
5 Immunochemical Diagnostics, Medical School and Teaching Hospital Pilsen, Charles University in Prague, Pilsen, Czech Republic;
6 Biomedical Centre, Faculty of Medicine in Pilsen, Charles University in Prague, Pilsen, Czech Republic

**Abstract:**

**Purpose:**
To evaluate capability of CT in differentiation of non-invasive or minimally invasive and invasive forms of pulmonary adenocarcinoma.

**Material and method:**
64 patients (38 men and 26 women, age 42-76, mean age 64) operated for pulmonary adenocarcinoma who underwent a chest CT in the period less than 1 month before surgery were selected for the study. As non-invasive or minimally invasive were considered lesions which contained only ground glass opacities or solid component smaller up to 5 mm.

**Results:**
Sensitivity of 77.7%, specificity of 97.8%, positive predictive value of 93.3% and negative predictive value of 91.8% were found when distinguishing non-invasive and minimally invasive types of adenocarcinoma.

The results of this study show that CT can be useful in assessing the degree of invasiveness of pulmonary adenocarcinoma and has the potential to be used in a personalized approach to patients.
Moiseeva, Natalia S., Ph.D., Associate Professor

Biography:
Voronezh N.N. Burdenko State Medical University, Russia, Department of Oral and Maxillofacial Surgery. Natalia S. Moiseeva graduated from Voronezh State Medical University named after N.N. Burdenko in 2011. Advanced training and specialization in Therapeutic dentistry at the VSMU named after N.N. Burdenko (2013, 2018); Surgical dentistry (2016); Pediatric dentistry (2017); training in the specialty "Teacher of higher education" Institute of VSMU named after N.N. Burdenko (2016). She took a Ph.D. degree in 2013 on the following topic: "Clinical and laboratory evaluation of the initial forms of the carious process using light-induced fluorescence and electrometry". Nowadays, she works as an Associate Professor and lecturer at the Department of Oral and Maxillofacial Surgery of the VSMU named after N.N. Burdenko. Permanent participation in the organization and holding of conferences at central and foreign levels. From 2014 to date she provides fundamental research studies on the following topic for the Dr.Med.Sc. degree: “Influence of electromagnetic fields on microstructure and morph-chemistry of polymeric base materials for personalized caries prevention”. She has 8 years of dental practice. She is the author of 105 publications in medical journals, 20 - foreign publications, as well as 3 patents with more than 125 citations in available literature. H-index 5.
natarzavov@yandex.ru

Title:
The impact evaluation of the electromagnetic field (EMF) on polymer based filling materials according to the clinical studies for the personalized prevention of secondary caries

Authors:
Moiseeva, N. S., 1, Kunin, A. A. 2, Kharitonov, D. Yu. 1, Morozov, A. N. 3, Podoprigora, A. V. 1
1Department of Oral and Maxillofacial Surgery
2Department of Hospital Dentistry
3Department of Propaedeutic Dentistry
Voronezh N.N. Burdenko State Medical University, Russia

Abstract:
Since 2014 on the base of VSMU named after N.N. Burdenko in collaboration with the Voronezh State University and the Voronezh State Forestry University named after G.F. Morozov we carried out fundamental experimental and clinical studies to assess the quality of filling and personalized prevention of secondary caries (staining of enamel at the border of filling with a solution of 2% methylene blue, evaluation of the quality of filling according to D.M. Karalnik (1978), measuring the conductivity of enamel) on the polymer-based filling materials with (group I) and without (group II) the electromagnetic field exposure. According to the purpose of our research we hold clinical investigations on the group of 216 people with a diagnosis of medium caries whose teeth were filled with Charisma (Heraeus Kulzer, Germany) polymeric filling material after preliminary exposure to the electromagnetic field and without it. As a result of our study we analyzed the dynamics of changes in the electrical enamel conductivity at different time period after the filling. The level of enamel mineralization was assessed using the electrical conductivity device named DentEst (Geosoft Dent, Moscow). The marginal adaptation of the filling material to the hard dental tissues was assessed
according to the R.G. Buyankina scale (1987). After filling the teeth, the electrical conductivity of the enamel decreased significantly in group I from $37.549 \pm 0.467 \mu A$ to $0.842 \pm 0.058 \mu A$, and in group II from $39.167 \pm 0.472 \mu A$ to $1.183 \pm 0.073 \mu A$, which indicates high-quality filling and normalization of ion-exchange processes at the filling border in both groups, but in I group, the effect was more pronounced, which indicates a positive effect of the electromagnetic field ($p<0.001$). One year after filling, the electrical conductivity of enamel in group I corresponds to $1.208 \pm 0.051 \mu A$, and in group II, the indication of electric conductivity increases significantly and corresponds to $2.601 \pm 0.051 \mu A$, which indicates a violation of the adaptation edge of the filling without the development of secondary caries according to the R.G. Buyankina scale ($p<0.001$). Thus, giving an assessment of the data obtained regarding the electrical conductivity of enamel, we can conclude that there is a significant positive effect of the electromagnetic field exposure on polymer filling materials in terms of improving the quality of personalized treatment and the target prevention of secondary caries due to the activation of the ion-exchange processes.

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**Title:**

The morphology alteration of polymer based toothpastes with the electromagnetic field exposure for the predictive caries prevention

**Authors:**

Moiseeva, N. S.¹, Kunin, A. A.², Stepanov, I. V.¹, Scherbinin, A. S.², Kumirova, O. A.¹

¹Department of Oral and Maxillofacial Surgery
²Department of Hospital Dentistry

Voronezh N.N. Burdenko State Medical University, Russia

**Abstract:**

On the base of VSMU named after N.N. Burdenko with the Voronezh State University and Voronezh State Forestry University named after G.F. Morozov, we conducted 1850 clinical studies using polymer-based toothpastes with and without the electromagnetic field exposure for the predictive caries prevention. The scientific base for the obtained data from clinical studies was a contingent of 58 people aged from 18 to 45 years old with intact teeth, who were underwent controlled tooth brushing for 1 month with R.O.C.S. active calcium toothpaste with (group 1) and without electromagnetic field exposure (group 2). To assess the effectiveness of the use of toothpaste R.O.C.S. active calcium with the electromagnetic field in terms of predictive caries prevention the following methods were carried out: functional enamel resistance, cariogenicity of dental plaque Hardwick J.L., Manly E.B. (1985) and the electrical enamel conductivity. After the controlled tooth brushing, the level of caries resistance in patients of group 1 significantly increased from $21.8 \pm 3.0\%$ to $5.8 \pm 0.6\%$ ($p<0.01$), and in group 2 from $20.8 \pm 2.8\%$ to $13.2 \pm 2.1\%$ ($p<0.05$), which indicates a more significant remineralizing effect of the toothpaste with the influence of an electromagnetic field in the surface enamel layer in comparison with group 2. The tooth plaque cariogenicity in patients of group 1 significantly decreased after the controlled brushing of teeth from $21.8 \pm 2.3\%$ to $9.2 \pm 0.5\%$ ($p<0.01$), and in group 2 from $21.6 \pm 2.2\%$ to $15.0 \pm 1.2\%$ ($p<0.05$), which is due to the prolonged antibacterial action of toothpaste with the electromagnetic field exposure. After the controlled brushing of teeth, the electrical enamel conductivity decreased significantly in group 1 from $0.8 \pm 0.1 \mu A$ to $0.1 \pm 0.01 \mu A$ ($p<0.01$), and in group 2 with $0.7 \pm 0.1 \mu A$ to $0.4 \pm 0.05 \mu A$ ($p<0.05$), which indicates a more effective predictive caries prevention in group 1. Positive preventive effect from the controlled tooth brushing with R.O.C.S. active calcium with the electromagnetic field exposure due to the fact that its mineral and polymer components, structured under the influence of an electromagnetic field, better penetrate the enamel and form a stable protective biofilm on its surface, providing a prolonged remineralizing effect in terms of predictive caries prevention.
Title:

Personalized approach in the quality of life evaluation in asthmatic children being prophylactically treated in pulmonological sanatorium

Authors:
Mokina, N.1, Yashkov, A.1, Safonicheva, O.2

1Samara State Medical University, Russian Federation
2I. M. Sechenov First Moscow State Medical University, Russian Federation

Abstract:

Background:
Bronchial asthma (BA) is a common disease in the paediatric group, in which bronchial obstruction and increased mucus formation makes it very difficult for patients to breathe, leading to a significant disruption in their life quality (QOL). The aim. To evaluate personally the quality of life in asthmatic children being prophylactically treated, highlighting the areas of functioning of the child’s personality, most susceptible to BA, at the background of sanatorium prophylactic treatment.

Methods:
In this study, 62 children aged 5 to 11 years (9.6 ± 1.7 years old) took part: 38 boys (9.7 ± 1.7 years old) and 24 girls (9.6 ± 1.8 years old). All children had a moderate BA degree, so they received basic therapy according to GINA and PAQLQ(S) parameters were assessed.

Results:
Significant differences were found in the integral indicator of QOL with parameters, most susceptible to the dynamics at the sanatorium treatment: vital activity restrictions in terms of physical activity and the emotional sphere with the final dynamics of the QOL integral indicator. At the same time, discriminant analysis confirmed the information content, and AUROC analysis showed significant sensitivity/specificity of QOL integral indicator parameters in monitoring QOL in the cohort.

Conclusion:
The differentiated assessment of the QoL, revealed significant differences in the integral QOL parameter in children with BA: restrictions of vital activity in terms of physical activity and emotional sphere with the final dynamics of the integral QoL indicator in children with bronchial asthma being prophylactically treated in pulmonological sanatorium.
Mozaffari, Mahmood S., Ph.D., DMD, FAHA; Professor

Biography:
Dr. Mahmood S. Mozaffari has dual training in basic medical sciences (Ph.D.) and dentistry (DMD) with hospital dentistry experience. He joined the Dental College of Georgia at Augusta University in 1994, where he is now a Tenured Professor in the Department of Oral Biology and Diagnostic Sciences with several college- and university-level joint appointments. Aside from teaching (e.g., pharmacology & therapeutics), his research interests include investigation of the role of novel immune/inflammatory mechanisms in periodontitis, acute kidney injury and myocardial infarction. He serves his university and the profession at multiple levels. Further, he is a fellow of the European Association for Predictive, Preventive and Personalized Medicine.

Title:
Opioid Crisis and Potential of Cannabinoids for Pain Control.

Authors:
Mozaffari, M. S.

Department of Oral Biology and Diagnostic Sciences, The Dental College of Georgia, Augusta University, Augusta, Georgia

Abstract:
The use of analgesic medications is a requirement for the overall management of a myriad of non-malignant and malignant conditions. Opiates/opioids have been used for their medicinal values, most notably for analgesia, since ancient times. However, their euphoric property coupled with their dependence liability have also contributed to addiction over the centuries. Yet, dependence emanating from prescription opioids is a recent phenomenon resulting in devastating consequences for the individuals abusing opioids and the societies at large. The reasons for the ongoing opioid crisis are multifaced and include lack of due consideration of the complex biopsychosocial phenomenon that is chronic pain and indiscriminate recommendation of opioids by health care professionals for painful conditions of varying etiologies. This is both surprising and disappointing because the well-known pharmacological properties of opiates/opioids should have predicted and prevented this crisis. Given its devastating consequences for communities, the opioid crisis has received much attention to stem the tide in the United States. Thus, the American experience must be put to good use to prevent similar crisis in other parts of the world such as Europe. Importantly, the opioid crisis has led to a surge of interest to identify novel targets and agents to impart pain relief. Among them are cannabinoids which have shown promising results in animal studies but heterogenous observations are reported from clinical studies. Collectively, the opioid crisis and ensuing search for alternative analgesics are of major relevance and significance for predictive, preventive and personalized medicine, aspects that will be thoroughly addressed.
analgesics are of major relevance and significance for are reported from clinical studies. To a surge of interest to identify novel targets and agents to impart pain relief, prevent similar stem the tide in the United States. Given its devastating consequences for communities, the opioid crisis has received much attention to known pharmacological properties of opiates/opioids sh

painful conditions of varying etiologies. That is chronic pain and indiscriminate recommendation of opioids by health care professionals for are multifaced and include lack of due consideration of the complex biopsychosocial phenomeno for the individuals abusing opioids and the societies at large. Emanating from prescription opioids is a dependence liability have also contributed to addiction over the centuries. Notably for analgesia, since ancient times.

Opiates/opioids have been used for t malignant and malignant conditions. However, their euphoric property coupled with their reconstructive and regenerative potential. Notably, they are known to modulate the release of inflammatory cytokines, including prostaglandins, and have been traditionally used in the treatment of inflammatory conditions. However, their use is now largely limited due to the high risk of addiction and dependence. Nonetheless, current research is focusing on identifying novel therapeutic approaches to harness the analgesic properties of opioids while minimizing their addictive potential.

The reasons for the ongoing opioid crisis are multifaceted and include lack of due consideration of the complex biopsychosocial phenomenon for the individuals abusing opioids and the societies at large. They include the availability and accessibility of opioids, the marketing strategies of the pharmaceutical industry, and the overprescription of opioids by healthcare providers. Additionally, the rise of the opioid epidemic is exacerbated by the lack of understanding of addiction as a chronic brain disease and the stigma associated with opioid use disorder.

Importantly, the opioid crisis has led to a surge of interest to identify novel targets and agents to prevent similar to stem the tide in the United States. Given its devastating consequences for communities, the opioid crisis has received much attention to known pharmacological properties of opiates/opioids shifting the focus to the development of alternative therapies. The reasons for the ongoing opioid crisis are multifaceted and include lack of due consideration of the complex biopsychosocial phenomenon for the individuals abusing opioids and the societies at large.

Mechanosensing and mechanotransduction, overlooked biological features in inflammation.

Mechanosensing and mechanotransduction are ubiquitous properties of cells, indicating how mechanical cues are sensed and converted into biochemical signals. Mechanical cues that are perceived as injuries have the capability to elicit the wound healing response, whose first phase correspond to an acute transient inflammatory phase, followed by regeneration and remodelling, globally enabling a return to homeostasis. While this phenomenon is well characterized and studied for local injuries, very little exploitation of the phenomenon is done in the clinics for systemic diseases, mostly likely owing to the limited and difficult characterization of wound healing as a systemic phenomenon.

We will recollect here our findings and knowledge in this direction, mostly in pre-clinical studies, where it is possible to envisage a global interaction between the events locally elicited by mechanosensory stimulation and the chain of molecular reactions that transduce the mechanical/electrical signal, modulating the activity of the sympathetic nervous system at the systemic level.

In particular we will present our results on the effect of a mechanical stimulation in a model of chronic inflammation (rheumatoid arthritis) on two systemic districts like blood and the gut-intestinal microbiome, with a focus on the host-microbiome crosstalk and its effects on the sphingolipid metabolism. Further, we will integrate these findings in a neurophysiology perspective, as mechanoreceptors stimulation modulates segmental and central control of sympathetic outflow that is the efferent arm of the anti-inflammatory reflex, ultimately drafting potential applications in the clinics on the control of inflammation, hallmark of numerous diseases.

Title:
Mechanosensing and mechanotransduction, overlooked biological features in inflammation.

Authors:
Nardini, C.1,2,3, Manni, L.4
1Department of Laboratory Medicine, Division of Clinical Chemistry Karolinska Institute, Sweden
2Bio Unit, Scientific and Medical Direction, SOL Group, Italy
3IAC "Mauro Picone", Consiglio Nazionale delle Ricerche CNR Italy
4Institute of translational pharmacology, Consiglio Nazionale delle Ricerche (CNR), Italy

Abstract:
Mechanosensing and mechanotransduction are ubiquitous properties of cells, indicating how mechanical cues are sensed and converted into biochemical signals. Mechanical cues that are perceived as injuries have the capability to elicit the wound healing response, whose first phase correspond to an acute transient inflammatory phase, followed by regeneration and remodelling, globally enabling a return to homeostasis. While this phenomenon is well characterized and studied for local injuries, very little exploitation of the phenomenon is done in the clinics for systemic diseases, mostly likely owing to the limited and difficult characterization of wound healing as a systemic phenomenon.

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In particular we will present our results on the effect of a mechanical stimulation in a model of chronic inflammation (rheumatoid arthritis) on two systemic districts like blood and the gut-intestinal microbiome, with a focus on the host-microbiome crosstalk and its effects on the sphingolipid metabolism. Further, we will integrate these findings in a neurophysiology perspective, as mechanoreceptors stimulation modulates segmental and central control of sympathetic outflow that is the efferent arm of the anti-inflammatory reflex, ultimately drafting potential applications in the clinics on the control of inflammation, hallmark of numerous diseases.
Navrátil, Václav, Ph.D.

Biography:
Václav Navrátil received Ph.D. in biochemistry at Institute of Organic Chemistry and Biochemistry in Prague (IOCB) in 2018. During his studies he developed the DIANA technology, which was awarded Werner von Siemens prize for the best Czech innovation in 2018. He is now a co-founder and CEO of DIANA Biotechnologies, an IOCB spin-off company aiming to further develop and commercialize the DIANA technology. The company focuses on main applications of DIANA, biomarker detection in vitro diagnostics and high throughput screening for bioactive compounds in drug discovery. It is also developing new applications in pharmacology and selectivity profiling of drug candidates, which will enable development of safer and more efficient drugs. Besides offering services, the company is advancing its internal drug discovery pipeline, collaborating with academic research labs to become regional center for drug discovery. Václav co-authored 14 articles in international impacted journals with 120 citations, H-index 7.

Title:
DIANA technology: unique tool for selectivity profiling of drug candidates and for biomarker detection

Authors:
Navrátil, V.1, Tykvart, J.1, Schimer, J.1, Zemanová, J.1

1DIANA Biotechnologies, s.r.o., Vestec, Czech Republic

Abstract:
Enzymes are most common drug targets as well as biomarkers for disease detection and surveillance. Determining selectivity of drug candidates against enzyme families and enzyme isoforms is crucial for the development of safe and efficient drugs. For example, Carbonic Anhydrases (CA) are targeted by several marketed drugs showing significant undesired side effects. Most probable reason is their non-selective inhibition of most CA isoforms, while development of selective compounds is hindered by the lack of methods for CA selectivity profiling.

Recently developed DIANA assay is suitable for both testing inhibitor potency and enzyme detection and overcomes current state of the art methodologies in sensitivity, linear range and applicability to test inhibitors with unpurified targets. We developed DIANA for selectivity profiling of inhibitors against all 12 human active anhydrases, which enables rapid profiling of hundreds of compounds per day. We have validated this panel on drugs with known profile and plan to profile collection of several thousands of approved drugs to provide insight into their selectivity. Moreover, isoforms 9 and 12 are upregulated in hypoxic tumors. We thus developed DIANA for detection of CA9 and 12 in human blood and we will test whether they are suitable as cancer markers.

There are more examples, we are developing also DIANA for selectivity profiling of human kinases, which are one of the most prominent targets. It can be also used for profiling kinases with clinical mutations or of in population highly variable cytochrom P-450 enzymes degrading drugs to enable personalized drug administration.
Individual quality of human follicular fluid predicts the success in assisted reproductive technology

Authors: Nevoral, J. 1,2, Jeseta, M. 3, Moravec J. 3, Stiavnicka, M. 3, Rimnacova, H. 3, Fenclova, T. 1, Zakova, J. 4, Kralickova, M. 1,2
1 Biomedical Center, Faculty of Medicine in Pilsen, Charles University, Czech Republic
2 Department of Histology and Embryology, Faculty of Medicine in Pilsen, Charles University, Czech Republic
3 Department of Obstetrics and Gynecology, University Hospital and Masaryk University, Brno, Czech Republic

Abstract:
The quality of matured human oocyte is crucial for the success of infertility healing due to assisted reproductive techniques (ART). Follicular fluid creates microenvironment of mature oocyte in ovarian follicle through the oogenesis and, therefore, potentially transducing endogenous influences as well as environmental noxi. Accordingly, a biological screening of follicular fluid represents a source of information determining the oocyte quality, destined for in vitro fertilization and embryo production. The aim of the study was to perform basic assessment of human follicular fluid (hFF) and subject it to advanced analysis of bisphenols, environmental pollutants endangering human reproductive health, using liquid chromatography-mass spectrometry (LC-MS; Bruker Daltonics) strategy. Patients (n=45) underwent an ART and provided an informed consent at University Hospital and Masaryk University, after the approval by the Institutional Ethical Committee of University Hospital Brno.

Our observations point out the omnipresence of bisphenols (BPA, BPS) in hFF, and an association with oocyte quality, manifested by developmental competence. There is obvious deterioration of early embryonic development, following in vitro fertilization of oocytes exposed to follicular BPA. The childbirth seems to be associated with total bisphenols’ presence in hFF as well. The need of further research arises for the elimination of pollutants in the environment and their deleterious effect on human health. Taken together, exogenous influence should be taken into the account in the individual approach of assisted reproductive techniques and, along with other parameters of hFF, for personalization of in vitro therapy of human infertility.

This study was supported by the Czech Health Research Council (NV18-01-00544), European Human Biomonitoring Initiative HBM4EU provided by H2020, the Charles University Research Fund (Progres Q39), and the National Sustainability Programme I (NPU I) Nr. LO1503 provided by the Ministry of Education, Youth and Sports of the Czech Republic.
Nikolaev, Vitaly A., M.D.

Biography:
Vitaly A. Nikolaev graduated from Moscow State University of Environmental Engineering (Russia) in 2009 (Master Degree). Since 2018 – graduate student in master degree program “Personalized health management and active longevity” in the major “Public Health” at Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University).

Vitaliy is currently working in Pirogov Russian National Research Medical University (Russia).

Research interests: personalized medicine, biomarkers, active longevity, public health.

Title:
Development of technologies for active longevity based on joint assessment of biomarkers and the results of human psychophysical tests

Authors:
Nikolaev, V. A.
Sechenov University, Russia

Abstract:
Traditional medicine is aimed at the treatment of diseases and, to a lesser extent, at their prevention. The future is for predictive, preventive and personalized medicine [1-3]. The biomarkers can be used as a first criterion in evaluation of the development of anti-premature aging approach in personalized medicine and to determine, monitor and track the aging process. But the biomarkers still need to have a demonstrated clinical utility prior to their implementation in medical services [1, 2]. Recent studies show that the use of only biomarkers is not enough in developing technologies of active longevity and personalized medicine.

The paper introduces an approach for developing active longevity technology based on the determination of the aging rate index. It is calculated as integrated index from a number of following medical tests for a particular person at a specific chronological age. Based on a blood test, the biomarkers (plasma albumin, alpha-1 acid glycoprotein, particle size of low-density lipoproteins and citrates) are determined. Mental test is used to assess the contribution of the current cognitive abilities [4]. An olfactory test allows assessing age-related changes [5] and an endurance test to determine a reduction in physical ability. Thus, a personalized approach to the results of four tests at different periods of the chronological age of a person allows to calculate the aging rate index, and develop complex of medical and social measures aimed at reducing the rate of aging and extend the active longevity of a person.
Nikolaev, Vitaly A.

Biography:
Vitaly A. Nikolaev graduated from Moscow State University of Environmental Engineering (Russia) in 2009 (Master Degree). Since 2018 – graduate student in master degree program “Personalized health management and active longevity” in the major “Public Health” at Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University). Vitaliy is currently working in Pirogov Russian National Research Medical University (Russia).

Research interests: personalized medicine, biomarkers, active longevity, public health.

Title: Development of technologies for active longevity based on joint assessment of biomarkers and the results of human psychophysical tests

Authors: Nikolaev, V. A. Sechenov University, Russia

Abstract: Traditional medicine is aimed at the treatment of diseases and, to a lesser extent, at their prevention. The future is for predictive, preventive and personalized medicine [1-3]. The biomarkers can be used as a first criterion in evaluation of the development of anti-premature aging approach in personalized medicine and to determine, monitor and track the aging process. But the biomarkers still need to have a demonstrated clinical utility prior to their implementation in medical services [1,2]. Recent studies show that the use of only biomarkers is not enough in developing technologies of active longevity and personalized medicine.

The paper introduces an approach for developing active longevity technology based on the determination of the aging rate index. It is calculated as integrated index from a number of following medical tests for a particular person at a specific chronological age. Based on a blood test, the biomarkers (plasma albumin, alpha-1 acid glycoprotein, particle size of low-density lipoproteins and citrates) are determined. Mental test is used to assess the contribution of the current cognitive abilities [4]. An olfactory test allows assessing age-related changes [5] and an endurance test to determine a reduction in physical ability. Thus, a personalized approach to the results of four tests at different periods of the chronological age of a person allows to calculate the aging rate index, and develop complex of medical and social measures aimed at reducing the rate of aging and extend the active longevity of a person.

References:
Nikulina, Dina, MD, PhD

Biography:
Head of the Department of Biochemistry and Clinical Laboratory Diagnostics of the Astrakhan State Medical University, Russia. Dina M. Nikulina graduated from Astrakhan Medical University, Faculty of Medicine, completed PhD thesis "Immunoochemical, physico-chemical and clinical study of beta-1-globulin of the pregnancy zone" and the doctoral "Minor serum protein - pregnancy-associated alpha 2-glycoprotein: theoretical and practical aspects".

Since 1982 professor D.M. Nikulina, is the head of scientific school on immunochemical study of embryonic and tumor tissues, founded by co-author of the discovery of alpha-fetoprotein professor Yu.S. Tatarinov. Her other research areas are search and study of markers of inflammation, hypoxia, destruction and formation of laboratory protocol to detect premorbid disadaptation during preventive examinations of the population. She is author of more than 350 scientific papers, patents and special projects and the supervisor of 42 candidates and doctors of science, among whom are representatives of practical public health. She has awards for innovative work at international exhibitions.

Title:

Pregnancy associated and antenatal proteins are markers of fetal development and newborn condition

Authors:
Nikulina, D., Vorobyeva, T., Ivanov, P., Bisaliyeva, R., Kriventsev, Yu., Shininova, S.

Department of Biochemistry and Clinical Laboratory Diagnostics of Astrakhan State Medical University, Russia

Abstract:

We studied embryonic (Hb E), fetal (Hb F), placental (trophoblastspecific beta-globulin - TSG) and maternal (pregnancy associated alpha2-glycoprotein - α2-PAG) proteins to pregnancy monitoring and determine fetal condition using commercial and self-developed immunochemical test systems.

TSG and α2-PAG immunosuppressive function is necessary for the development of pregnancy. We analyzed ratio of their level in physiological pregnancy (> 1000 cases) and in complicated pregnancy (446). Production of both proteins has increasing dynamics parallel with pregnancy period. And the level of maternal protein is higher than placental only at the beginning of pregnancy. In the second pregnancy period, TSG "overtakes" α2-PAG by increasing the placenta volume, which allows it to more actively perform of maintaining immunotolerance function in the mother-fetus-placenta system.

HbF level increases during various hypoxia, because it has a greater affinity for oxygen. With 243 newborns, we have tested the assumption that not only HbF but also HbE genes are involved in the process of differential activation depending on the degree of chronic intrauterine hypoxia. The increase HbF level in cord blood by 28% was found in severe intrauterine hypoxia, and in combination intrauterine fetus development retardation with severe hypoxia by 68%.

Consequently, balanced biological activity TSG and α2-PAG is important for the favorable development of pregnancy and successful birth outcome. The ratio of these proteins was calculated for clinical assessment of pregnancy development. A coefficient significant change was during late gestosis, placental insufficiency, fetal intrauterine infection and prolonged pregnancy.
Novák, Jaroslav, Ph.D.

Biography:
Jaroslav Novák graduated from Charles University, Medical Faculty in Plzen in 1964. He is specialized in internal medicine and sports medicine. Recently, he works in the Department of Sports Medicine in the Medical Faculty in Plzen. In the 80th he chaired Laboratory of Physiology and Sports Medicine of the Top Sport Department in the Research Institute of Physical Culture in Prague. He has completed his PhD in 2015 (“Cardiorespiratory fitness of sporting population”). He has published more than 100 papers in reputed journals. For several terms he was elected board member of the Czech (Czechoslovak) Society of Sports Medicine. Mr. Novak was active in swimming, water polo, triathlon and other sports, and still today participates in masters competitions.

Title:
Ultra-marathon athletic events-healthy or hazardous?

Authors:
Novák, J.¹, Topolčan, O.², Racek, J.³, Brož, P.³
¹Department of Sports Medicine, Medical Faculty of Charles University in Plzen
²Department of Immunochemistry Diagnostics, University Hospital in Plzen
³Department of Biochemistry and Hematology, University Hospital in Plzen

Abstract:
So called ultra-running belongs to one of the fastest growing sports around the world. “Ultra” event officially means anything longer than the 42.2 Km (26 miles and 385 yards) – distance of marathon run. There is growing number ultra-races including 50 or 100 Km, 50 or 100 miles, 24 hours run, and some much longer events. Ultra-runners benefit thanks to their regular physical activity like many other endurance athletes in many ways: reduced risk of cardiovascular disease, reduced risk of high blood pressure, reduced risk of dyslipidaemia, better sleep, better mood, better brain performance, low risk of osteoporosis and many others.

However, each of the ultra-runners should be well informed about health risks, which under certain circumstances can cause serious health problems. Very common problem is microscopic damage in the muscle fibers leading to DOMS (delayed onset of muscle soreness). In extreme situation rhabdomyolysis occurs, and consequently renal failure can develop. Damaged muscle tissue evokes inflammatory reaction, characterized by enormous augmentation of different cytokines. Majority of ultra runners experienced also “hitting the wall” situation, connected to hypoglycemia during the race. According to Patil et al. (2012), continuous running such as is required for training and participating in a marathon (and in ultra-marathon as well) may be detrimental to cardiovascular health. Extreme endurance exercise can create an arrhythmogenic substrate. Myocardial fibrosis develops as a reparative process in response to damaged myocardium. These abnormalities are often asymptomatic and may predispose to serious arrhythmias and/or sudden cardiac death. Despite of
the health risks, healthy runners mostly recover within short time after the performance. Numerous biomarkers are used to diagnose the gravity of body reaction to the extreme physical load, and the course of recovery. The runners should be well informed about the risks and how to prevent them. Most recent U.S. studies recognize the risks of extreme ultra endurance performance, however, not unexpectedly they found out that ultra-runners are healthier then overall U.S. population.

**Reference:**
Patil HR et al.: Cardivascular damage resulting from chronic excesive endurance exercise. Missouri Med 2012; 109, 4: 312-321

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**Title:**

**Physical fitness assessment as an important biomarker of the cardiovascular and metabolic diseases**

**Authors:**
Novák, J.1, Kroužecký, A.1, Štork, M.2

1Department of Sports Medicine, Medical Faculty of Charles University in Pilsen, CZE
2Department of Applied Electronics and Telecommunications, University of West Bohemia in Pilsen, CZE

**Abstract:**
Regular exercise and physical activity help to control body weight, reduce risk of heart diseases, manage blood sugar and insulin levels, reduce risk of some cancers, Improve mental health and mood .... and increase chances of living longer. It causes to make adjustments that result in improved health and physical functioning. In our study, based of the VO2max testing in sporting and non sporting population (n=2777, 2015 men and 762 women) all competitively sporting group reported above average aerobic capacity and lower „fitness age“, while aerobic capacity in the groups of non-competitive (leisure) activities the level of aerobic capacity reached the IBP standards for Czech population. There are numerous methods how to estimate indirectly VO2max either using ergometry or motor tests. Recently the non-exercise regression model was fairly accurate in predicting VO2peak in healthy population of men and women. It was based on the data of self reporting physical activity, age, body height, weight, BMI and waist circumference (Nes et al. 2011). The model might be a valid tool for a rough assessment of cardiorespiratory fitness in an outpatient setting.

**Reference:**
Title:
Planning and implementation of personalized programs for periodontal disease prevention

Authors:
Oleynik, O. I., Kunin, A. A., Kubyshkina, K. P., Vusataya, Y. V.

Abstract:
According to WHO, about 95% of adults and more than 80% of schoolchildren globally have signs of periodontal diseases. The internal organ pathology detected in 97% of patients with periodontitis suggests a close relationship between periodontal structures and the general body state, which demands new views on the diagnosis, treatment and prevention of periodontal diseases. The aim of study was to increase the effectiveness of the prevention of periodontitis through the personalized program development. The study included 300 patients with risk factors affecting their periodontal status: 1) decrease in local immunity and the overall body resistance; 2) low level of oral hygiene; 3) violations of the oral vestibule tissue structure; 4) nutrition habits; 5) systemic disorders. A complex of clinical and laboratory methods was developed to identify pathology at the pre-nosological level. Somatic pathologies were found in 127 (42.3%) of patients. All patients were divided into groups: demanding personalized prevention or treatment, receiving secondary prevention, undergoing follow-ups. The individual prevention program implemented specific elements: risk factors elimination for the development of periodontal disease, individual oral hygiene, acid-base balance correction of the oral cavity etc. Secondary prevention included: ultrasonic root treatment with hydroxylapatite, elimination of bacterial contamination of periodontal pockets, physiotherapy and drug effects to circulation and periodontal metabolism etc. Personalized treatment and prevention performed during 2015-2018 allowed achieving significant reduction in the prevalence (by 52.6%) and intensity of periodontal pathology in a cohort of a separate dental clinic.
Ostašov, Pavel, Mgr., Ph.D.

Biography:
Pavel Ostasov graduated from Charles University, Faculty of Science in 2005. He then worked as a junior research assistant at the Department of membrane receptors, Institute of Physiology, Czech Academy of Sciences. He took a Ph.D. degree in 2011 at the Faculty of Science, Charles University on the topic “Effect of cholesterol depletion on signaling cascade initiated with receptors coupled to G protein class Gq/G11”. In 2012 he became a lecturer at the Department of Histology and Embryology of Medical Faculty in Pilsen, Charles University. Nowadays, he works there as a researcher in the Laboratory of tumor biology and teaches histology. His main research interest is liquid biopsy like analysis of clonality of circulating tumor cells, but lately focusing on analysis of extracellular vesicles and RNAs in plasma of cancer patients. He has almost 80 citations in available literature and H-index 5.

Title:

Extracellular long non-coding RNAs and mRNAs in plasma of patients with colorectal cancer

Authors:
Ostašov, P.1, Rosendorf, J.1,2, Vycital, O.1,2, Palek, R.1,2, Liska, V.1,2
1Biomedical Center, Faculty of Medicine in Pilsen, Charles University, Pilsen, Czech Republic
2Department of Surgery, University Hospital and Faculty of Medicine in Pilsen, Charles University, Pilsen, Czech Republic

Abstract:

Introduction:
RNA is not confined to individual cells, but is also part of protein complexes or extracellular vesicles secreted by cells like exosomes. These extracellular RNAs could be isolated from various bodily fluids like plasma. There is an intensive ongoing research of these RNAs to assess their utility as biomarkers in cancer and other diseases. While the focus is mainly on small RNAs like microRNAs, we decided to focus on long extracellular RNA species-long non-coding RNAs and mRNAs in colorectal cancer. Advantage of mRNAs is their extensive annotation that allows complex analysis of observed changes. In addition it might be possible to use long non-coding RNAs and mRNAs for detection of mutations, edits or splicing events useful for identification of changes occurring during tumor progression or for therapy management.

Methods:
We analyzed publicly available sequencing data of exosomal RNAs as well as extracellular RNAs isolated from plasma of healthy volunteers and colorectal cancer patients. The analysis included differential gene expression, presence of RNA regions and splicing variants.

Results:
We detected changes in expression of genes associated with RNA processing in samples from patients with colorectal cancer and change in expression of specific splicing variant of APC gene.

Support:
This work has been supported by the Charles University Research Fund (Progres Q39), Charles University Research Centre program UNCE/MED/006 “University Center of Clinical and Experimental Liver Surgery” and National Sustainability Program I (NPU I) Nr. LO1503 by the Ministry of Education Youth and Sports of the Czech Republic.
Title:
Flammer Syndrome and Autoimmune Inflammatory Conditions of the Central Nervous System: Multifactorial Interrelations

Authors:
Paul, F.
NeuroCure Clinical Research Center
Experimental and Clinical Research Center
Max Delbrueck Center for Molecular Medicine, Charité Universitaetsmedizin Berlin
Germany

Abstract:
Multiple sclerosis (MS) is the most frequent autoimmune inflammatory and neurodegenerative central nervous system disorder that affects mostly young females and manifests with transient or irreversible neurologic dysfunction caused by demyelination and subsequent axonal transection and neuronal demise. Besides genetic susceptibility, environmental risk factors play a causative role. Although the exact immunopathogenesis has not been fully clarified, the condition is – albeit incurable – amenable to treatment with immunomodulatory drugs. Structural and functional changes in the brain and retinal vasculature in MS causing cerebral hypoperfusion may be a potential pathophysiological link with Flammer Syndrome (FS). However, only one study thus far has systematically investigated the co-occurrence of MS and FS and has shown that multiple symptoms and signs considered as characteristic of FS occur more often in MS patients than in unselected controls. While there is some overlap in symptomatology and clinical findings between the 2 conditions, this does not imply causality, but this preliminary observation should trigger more research on pathophysiological commonalities and clinical course of patients who are eventually diagnosed with both disorders. Susac Syndrome (SuS) is a very rare presumably immune mediated central nervous system disease that affects microvessels in the brain, the retina and the inner ear. This may cause secondary vascular dysregulation and thus signs and symptoms of FS, while it was also proposed that FS may predispose to SuS. However, as in MS assumptions on a potential association of SuS with FS are still poorly supported by rigorous data.
Pecen, Ladislav, Ph.D., Associate Professor

Biography:
Ladislav Pecen graduated from Charles University, Faculty of Mathematics and Physics in Prague in 1986. He took a CSc. (equivalent of Ph.D.) degree in 1993 at Charles University Prague. In 2001 he defended his habilitation thesis “Medical Data Modelling and Statistical Based Decision Support Systems” and took the degree of associate professor (docent in Czechia) again at Charles University Prague. His main research objectives are biostatistics, especially survival analysis models with time-dependent covariates. Recently he works mainly as senior biostatistician for different pharma and CRO companies. He also works in Institute of Computer Science of the Czech Academy of Science Prague and Faculty Hospital Pilsen. He is an author of more than 200 papers in medical journals with more than 2400 citations in available literature, H-index 19 and Research Gate RG score 43.20.

Title:
Biomarkers in combination with other prognostic and predictive factors-invididualized multivariate statistical models for risk estimation and optimal therapy selection

Authors:
Pecen, L.
Department of Immunochemistry Diagnostics, University Hospital in Pilsen
Institute of Computer Science of the Czech Academy of Science Prague, Czech Republic

Abstract:
Each patient has their own individual characteristics. It is given by its main diagnosis and its detailed description (e.g., in oncology by TNM classification, grading, histological type etc.), comorbidities, results of genetic markers, biomarkers and many other factors. Standard patient care is usually based on the results of large clinical trials. This approach ignores the patient's individuality. Using patient profiling based on tumor characteristics, genetic markers and biomarkers, it is possible to identify the drug with the highest clinical benefit for small patient groups where, according to the guidelines, treatment choice is no longer defined only by diagnosis and TNM classification. This procedure belongs to the area of personalized medicine. An important methodology is how to find similar patients to a new patient and how to evaluate clinical benefits and risks of different types of therapies in this group of similar patients. The main focus is on overall survival, but time to progression and adverse reactions to treatment are also important. Based on extensive patient data available in electronic medical records (hospital information systems), similar cases to a new patient can be identified and some statistics for these similar patients can be provided. Based on a similar approach patient prognosis can be estimated and for healthy person e.g., 5-years or lifetime risk of developing a specified disease can be estimated. An example of breast cancer risk development model created by the author is http://calc.koc.cz/pro_lekare/vypocet_rizika_nadoru_prsu.html
Title:
A new version of BIANTA and CRACTES software to help in the interpretation of tumor markers in different in different periods of cancer disease

Authors:
Pecen, L.
Department of Immunochemistry Diagnostics, University Hospital in Pilsen
Institute of Computer Science of the Czech Academy of Science Prague, Czech Republic

Abstract:
Most tumor markers have increased serum concentrations in multiple tumor diagnoses, or markers may be increased also for many non-malignant causes. Tumor markers are often measured repeatedly, especially in the context of cancer patient follow up or in monitoring the effect of therapy. Moreover, usually not only one tumor marker is measured, but multiple markers are assessed. All these factors make the interpretation of tumor marker results very difficult and requires extensive experiences. Based on extensive clinically validated data of approximately 100000 patients and suitable statistical models, BIANTA and CRACTES softwares were created. BIANTA is used to help in the interpretation of tumor markers in cases where there is a strong suspicion of cancer, event. metastases are found but the location of the primary tumor is not clear. This software can also be used for screening of prostate or ovarian tumors. Clinical validation of BIANTA software showed that of the cases initially diagnosed as C80 "malignant neoplasm without known location", BIANTA was able to determine the correct diagnosis at one of the first 3 places in 95%. When compared with 6 physicians who did not know any other clinical data on patients, only one physician was better than BIANTA software. Validation of CRACTES showed that by taking into account the growingth of tumor markers (also belwo cut off), this software was able to increase sensitivity by 10-20% without increasing false positives compared to traditional comparison of recent marker concentrations with cut off.

Title:
Statistical steps which should be done in each study in medical research

Authors:
Pecen, L.
Department of Immunochemistry Diagnostics, University Hospital in Pilsen
Institute of Computer Science of the Czech Academy of Science Prague, Czech Republic

Abstract:
A statistician should participate in the planning of a medical study as early as possible-to help in designing of the study, - to select the statistical methods to be employed, - to determine the optimal number of subjects. Statistician should also participate in checking of a data quality. Quality data would be defined as data that sufficiently support conclusions and interpretations equivalent to those derived from error-free data. Statistician should also participate in interpretation of the results, formulation of all conclusions in study report and scientific papers. It has to be distinguished between-confirmatory testing (the hypothesis is stated in advance and than evaluated) and - exploratory testing (explore the data collected with potentially data-driven approache). Statistical issues in personalized medicine will be also discused in this presentation. Opportunities of statistics in personalized medicine are - biomarkers based strategy, - adaptive patient enrichment strategy, - optimal patient subgroup identification, - multiplicity adjustment. Statistical based computer systems and also artificial intelligence can be used to determine solutions and correlations on the basis of aggregated "omics" (genomics, epigenomics, proteomics, metabolomics, lipidomics, exposomics, microbiomics) data.
Pešta, Martin, RNDr., Ph.D., Associate professor

Biography:
Associate professor RNDr. Martin Pešta, Ph.D. studied Immunology at the Faculty of Science, Charles University. After graduation he joined the HLA Laboratory of the Transfusion Department of the University Hospital in Pilsen, then worked at the Department of Clinical Genetics, University Hospital Pilsen. In 2003, he passed the attestation in the field of “Examination Methods in Medical Genetics”. He defended PhD thesis at the Faculty of Medicine in Pilsen, Charles University with the topic "Monitoring of biological activity of colorectal cancer". In 2016, he habilitated at the Faculty of Medicine in Pilsen, Charles University with a habilitation thesis entitled "Selected prognostic and predictive markers of solid tumors monitored at RNA expression level". Since 2013 he has been a head of the Department of Biology, Faculty of Medicine in Pilsen, Charles University. H-index according to WOS 16.

Title:
Plasma microRNA levels with CEA and CA19-9 in the follow-up of colorectal cancer patients

Authors:
Pešta, M.1,2, Kučera, R.2,3, Topločan, O.2, Karlíková, M.2, Houfková, K.1, Polivka, J.2,4, Macanová, T.1, Machová, I.2, Slouka, D.2, Kulda, V.3

1Department of Biology, Charles University, Faculty of Medicine in Pilsen, Czech Republic
2Laboratory of Immunoanalysis, University Hospital in Pilsen, Czech Republic
3Department of Medical Chemistry and Biochemistry, Charles University, Faculty of Medicine in Pilsen, Czech Republic
4Department of Histology and Embryology, Charles University, Faculty of Medicine in Pilsen, Czech Republic

Abstract:
Colorectal cancer (CRC) ranks among the most common cancers worldwide. Surgical removal remains the best strategy for treatment of resectable tumours. An important part of caring for patients after surgery is their monitoring for early detection of a possible relapse of the disease. Efforts are being made to improve the sensitivity and specificity of routinely used carcinoembryonic antigen (CEA) with the use of additional biomarkers such as microRNAs. The aim of the study was to identify miRNAs with a significant difference between preoperative and postoperative plasma levels, and to evaluate their ability to contribute to early detection of disease recurrence. We also evaluated the relation of those biomarkers to prognosis. The quantitative estimation of CEA, CA19-9 and 22 selected microRNAs was performed in 85 paired (preoperative and postoperative) blood plasma samples of CRC patients and in samples taken during the follow-up period. We have revealed a statistically significant decrease in plasma levels for miR-20a, miR-23a, miR-210 and miR-223a after surgical removal of the tumour tissue. A statistically significant relation to prognosis (overall survival) was recorded for preoperative plasma levels of miR-20a, miR-21 and miR-23a. The best discrimination between patients with favourable and unfavourable outcomes was achieved by a combination of CEA, CA19-9 with miR-21, miR-20a, and miR-23a. The use of these microRNAs for early disease recurrence detection was affected by a low specificity in comparison with CEA and CA19-9. CEA and CA19-9 had high specificity but low sensitivity. Our results show the benefit of combining currently used standard biomarkers and microRNAs for precise prognosis estimation.

Funding:
The work was supported by the grant of Ministry of Health of the Czech Republic - Conceptual Development of Research Organization (Faculty Hospital in Pilsen – FNPI, 00669806)
Title:
Anonymous online treatment and prevention of shift work sleep disorder in companies

Authors:
Peter, L.¹,², Reindl, R.², Zauter, S.², Hillemacher, T.¹, Richter, K.¹,²
¹University Clinic for Psychiatry and Psychotherapy, Paracelsus Medical University, Nuremberg, Germany
²Faculty for Social Sciences, University of Applied Sciences Georg Simon Ohm, Nuremberg, Germany

Abstract:
Objectives:
About one in six employees works in shifts. Although shiftwork is associated with a number of poor health outcomes, especially sleep issues, prevention programs and treatment options that are specifically tailored to shift workers’ needs are rare.

Methods:
We devised, conducted, and evaluated a 4-week online sleep intervention for shift workers, consisting of psychoeducation, sleep restriction, and relaxation techniques. 50 Participants were recruited by partnering company doctors, of which 21 completed the program. Changes in symptoms were measured using sleep protocols, as well as the WHO-5, ISI, and ESS scales, and compared to shift workers treated in an outpatient setting in our clinic (n = 12).

Results:
Results show significant improvements regarding insomnia symptoms, well-being, total sleep time, and sleep efficiency (all p < .05). Rates of improvement did not differ between the online and outpatient sample.

Discussion:
Over the course of the counselling program, participants’ quality and quantity of sleep as well as their well-being improved. Randomized controlled trials are needed in order to be able to make statements about cause and effect.
Title:
The need for a systematic individual approach in the treatment of osteoporosis

Authors:
Pikner, R.1,2,3, Švagr, M.4, Novák, V.1, Vachek, J.5

1Department of Clinical Biochemistry and Bone Metabolism, Klatovska Hospital, Klatovy, Czech Republic
2Department of Clinical Biochemistry and Haematology, Faculty of Medicine Pilsen, Charles University Prague, Pilsen, Czech Republic
3Faculty of Health Care Studies, University of West Bohemia, Pilsen, Czech Republic
4Department of Orthopaedics, Klatovska Hospital, Klatovy, Czech Republic
5Department of Internal Medicine, Klatovska Hospital, Klatovy, Czech Republic

Abstract:
Osteoporosis is a frequent, multifactorial disease and represents a significant and increasing healthcare burden in Europe. Every third woman and fifth man are at risk of an osteoporotic fracture. The most common fractures are hip, forearm and vertebral fractures. Fractures caused by osteoporosis result in substantial bone-associated morbidities, and increased mortality and health-care costs. Fracture incidence and risk increase with age, low bone density and number of falls, differs by ethnicity and countries. Many additional risk factors have been identified (medication, hyperparathyroidism, high bone turnover) in past years. Development of fracture risk calculators (FRAX, Garvan etc.) combining risk factors improve individual assessment of fracture risk. These diagnostic improvements led to a more accurate assessment of fracture risk. Available and increased range of therapeutic options helps to prevent fractures. Fracture risk algorithms that combine clinical risk factors and bone mineral density are now widely used in clinical practice to identify target high-risk individuals for treatment. Despite these improvements majority of patients at increased risk of fracture do not receive medication, resulting in a large treatment gap. Therefore nowadays challenges are identify high risk patients. Implementation of fracture liaison service may be very helpful. Fracture liaison service might ensure that each and every patient presenting with a fragility fracture can receive the secondary preventive care. As the osteoporosis is multifactorial than therapeutic approach should be individualised respecting individual patients’ risk factors and needs.
Factors and needs. Patient presenting with a fragility fracture can receive the secondary preventive care. As the osteoporosis fracture liaison service may be very helpful. Fracture liaison service might ensure that each and every large treatment gap. Therefore nowadays challenges are identify high risk patient now widely used in clinical practice t

Prevent fractures. Fracture risk algorithms that combine clinical risk factors and bone mineral density are accurate assessment of fracture risk. Available and increased range of therapeutic options helps to factors improve individual assessment of fracture risk. These diagnostic turnover) in past years. Development of fracture risk calculators (FRAX, Garvan etc.) combining risk incidence and risk increase with age, low bone density and number of falls, differs by ethnicity and substantial bone burden in Europe. Every third woman and fifth man are at risk of an osteoporotic fracture. The most

Abstract:

Pitule, Pavel, MSc., Ph.D.

Biography:
Biomedical Centre and Department of histology and embryology, Faculty of Medicine in Pilsen, Charles University.
Pavel Pitule graduated from Charles University, Faculty of Science in 2010 and obtained his Ph.D. degree at the Charles University, Faculty of Medicine in Pilsen in 2014 with the doctoral thesis “Relation of tumor genotype and phenotype to diagnosis, prognosis and prediction of colorectal cancer”. In 2014 he established Laboratory of tumor biology within the newly formed Biomedical Center of the Faculty of Medicine in Pilsen and was principal investigator of this lab till the end of the year 2018. Currently he is gaining new experience in the antibody discovery company AbCheck and continues with his research focused on molecular alterations in malignant disease as a junior researcher in his former lab. He is an author of over 20 publications with 240 citations and h-index 7. pavel.pitule@lfp.cuni.cz

Title:
Circulating tumor cells in advanced colorectal cancer

Authors:
Pitule, P.1, Thiele, J. A. 1, Ostasov, P.1, Kolencik, D.1, Liska, V.2, Vycital, O.2, Bruha, J.2, Hosek, P.1, Kralickova, M.2, Kuhn, P.4

1Biomedical Center, Faculty of Medicine in Pilsen, Charles University, Czech Republic.
2The Bridge Institute, Dornsife College of Letters, Arts and Sciences, University of Southern California, USA
3Department of Embryology and Histology, Faculty of Medicine in Pilsen, Czech Republic
4Department of Surgery, Faculty of Medicine and University Hospital in Pilsen, Charles University, Czech Republic

Abstract:
Circulating tumor cells (CTCs) represent a crucial step in cancer metastatic cascade and understanding their biology could improve future anti-cancer treatment. Analysis of circulating tumor cells already proved to provide significant information that could be used in cancer management. In several cancer types, enumeration of CTCs is sufficient for disease prognosis, although further molecular characterization brings additional information that could be used for treatment prediction, as was shown on the example of prostate cancer. In colorectal cancer (CRC), applicability of CTCs can be limited due to two filters, liver and lung, that CTCs have to pass before they get into the peripheral blood. Therefore, with uncertain enumeration, molecular and genomic profiling of CTCs might provide further information useful in clinical surveillance of patients. In our study, we characterized CTCs in patients with advanced CRC and described clonal relationships between CTCs, primary tumor tissue and liver metastases. Unique HD-SCA platform was used for CTC detection and characterization, with final step being single cell whole genome sequencing to describe copy number variations within CTC genome. Within 47 analyzed patients, CTCs were detected in 58.7% cases. Eleven patients underwent CTC sequencing with 21.3% of analyzed cells having alterations in their genomic profile. In contrast to analyzed tissue samples, we found no clonality in CTCs. This work has been supported by the Charles University Research Fund (Progres Q39), by Charles University Research Centre program UNCE/MED/006 and by the National Sustainability Program I (NPU I) Nr. LO1503.
Podbielska, Halina, Prof. Dr. Hab. PhD MD Eng.

Biography:
Prof. Halina Podbielska received her M.Sc.Eng. and Ph.D. degree from the Faculty of Fundamental Problems of Technology, Wroclaw University of Science and Technology (WrUST), both awarded for Excellence. She also received M.D. degree from the Faculty of Medicine of Medical University of Wroclaw. She is the chair of the Biomedical Engineering Department. She was visiting scientist in several scientific institutions worldwide: as an A. v. Humboldt fellow at the University of Frankfurt/Main), University of Muenster and then at the Weizmann Institute of Science, Israel. She was a visiting professor at the Institute of Optics of Technical University in Berlin and at the Charite Medizin University of Berlin working at the Medical Laser Technology Center LMTB, Germany. Her professional experiences include biomedical engineering with emphasis on medical application of optics, nanomaterials and physical medicine. Over 360 publications, Scopus citations 647, HI 12.

Title:
Consensual reaction as an indication for personalization of physiotherapeutic treatment

Authors:
Podbielska, H., Spodniewska, M., Bauer, J.
Department of Biomedical Engineering, Wroclaw University of Science and Technology, Wroclaw, Poland

Abstract:
The aim of the study was to assess the contralateral response in healthy volunteers exposed to various physiotherapeutic treatments: local cryotherapy, ultrasonotherapy, electrostimulation with diadynamic currents and infrared radiation (sollux lamp). Treatments were performed on the quadriceps muscle of the right leg, whilst corresponding place on the left leg was the reference limb. Thermographic images were taken before immediately after the procedure, and then 15 minutes and 30 minutes after the procedure. Altogether, 708 thermograms were analyzed, followed by in-depth statistical analysis (1) two-factor analysis of variance (Anova), (2) Bonferroni post-hoc analysis, (3) correlation analysis and (4) stepwise regression. Statistically significant temperature differences between the treated limb and the reference limb were observed, confirming the presence of consensual reaction after all of 4 monotherapies analyzed. In addition, the analysis was extended by the Bonferroni correction, which allowed to determine the occurrence of a consensual reaction at the confidence level of 0.99 for all analyzed therapies except for electrotherapy. By means of stepwise regression, it was assessed, how the consensual reaction depends on the age and sex of the patients. The consensual response is an individual characteristic of the person and thus can be used for personalization of physiotherapeutic treatment.
Polívka, Jiří, MD, Ph.D.

Biography:
Head of the Department of Neurology, University Hospital and Faculty of Medicine of Charles University in Pilsen. His primary focus are cerebrovascular diseases and neuro-oncology. He is chairman of the Section of Neuropharmacology of the Czech Society of Neurology and the national representative in the Panel of Neuro-oncology of the European Academy of Neurology.

Title:
Health and socio-economic consequences of Young Stroke

Authors:
Polivka, J.1,2,6, Rohan, V.1,2,6, Sevcik, P.1,2,6, Polivka, J. jr1,2,3,4,6, Stibrana, K.1, Stela, J.1, Celedova, L.5, Cevela, R.5
1Faculty of Medicine in Pilsen, Charles University
2Department of Neurology
3Department of Histology and Embryology
4Biomedical Center
5Department of Social and Assessment Medicine
6University Hospital Pilsen, Department of Neurology

Abstract:
Young stroke is a multifactorial disease with increasing incidence and high impact of health and socio-economic status of survivors. Along with the traditional causes and types of stroke known in elderly population, some less common causes and stroke types are frequent in young age categories - arterial dissection, cerebral venous/sinus thrombosis, vasculopathies, aneurysmal subarachnoid haemorrhage etc. A total of 220 consecutive young stroke patients (age range 18-49 years) hospitalised in the Complex Stroke Center of University Hospital Pilsen are analysed. Their 3 month and 12 month outcome show significant impact on their health status and socio-economic consequences due to long-term disability and invalidity. Traditional and „unusual“ stroke causes and stroke types are discussed in details as well as personalised treatment and outcomes. Socio-economic consequences (long-term disability, invalidity, direct costs for treatment from health insurance, indirect costs from social state system) are also discussed. The role of secondary stroke prevention and tools of primary stroke prevention in young population are presented.
Polívka, Jiří jr., Ph.D.

Biography:
Jiri Polivka works as a junior researcher at the department of Histology and Embryology and Laboratory of Tumor Biology, Biomedical center, Faculty of Medicine in Pilsen, Charles University. He also works as a researcher at the Department of Neurology, University Hospital Pilsen. His research interest is focused mainly on personalized medicine and molecular oncology, targeted anticancer therapy and modern immunotherapy. He is also interested in stroke research. He is a national representative of the Czech Republic in the EPMA young professionals section-EPMA-YPS. He is an author of more than 40 articles in medical journals with more than 600 citations in WoS, H-index 10.

Correspondence:
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Title:
Personalized management of primary brain tumors, are we there yet?

Authors:
Polivka, J. jr.1,2,3, Svajdler, M.4,5, Polivka, J.3
1Department of Histology and Embryology, Faculty of Medicine in Pilsen, Charles University, Czech Republic
2Biomedical Center, Faculty of Medicine in Pilsen, Charles University, Czech Republic
3Department of Neurology, University Hospital Pilsen, Czech Republic
4Sikl's Department of Pathology, Faculty of Medicine in Pilsen, Charles University, Czech Republic
5Biopticka laborator s.r.o., Pilsen, Czech Republic

Keywords:
Personalized medicine, Glioblastoma multiforme, Brain Tumor, Glioma, Immune checkpoint inhibitors, Targeted therapy, Clinical trials

Abstract:
Primary brain tumors and especially high-grade gliomas represent an important group of less common but difficult to treat malignancies. Standard therapy (surgery, radiotherapy and chemotherapy) provides only limited effectiveness. Progress in molecular genetics and epigenetics of glial tumors has revealed various aberrations in cellular signaling pathways, the tumor microenvironment, and pathological angiogenesis. A number of targeted anticancer drugs, such as small-molecule kinase inhibitors and monoclonal antibodies, are being evaluated in ongoing clinical trials. The presentation will discuss recent early clinical data from studies evaluating antitumor immunotherapy using so-called “immune checkpoints inhibitors” as well. The application of personalized medicine principles using next generation sequencing of primary brain tumors in our hospital will be also discussed. This work was supported by MH CZ - DRO (Faculty Hospital Plzen - FNPI, 00669806), and by the National Sustainability Program I (NPU I) Nr. LO1503 provided by the Ministry of Education Youth and Sports of the Czech Republic, and by the Charles University Research Fund (Progres Q39).
Procházková, Kristýna, MD, PhD

Biography:
Having earned her master’s in education from the University of West Bohemia in 2006, she went on to graduate from Charles University, Faculty of Medicine in Pilsen, in June 2013. During her residency at the Department of Urology (7/2013 – 8/2018), University Hospital in Pilsen, she finished her postdoctoral studies in surgery (graduated in March 2018). The majority of her work is focused on Papillary Renal Carcinoma. Since September 2018, she has been a resident at the Department of Surgery, University Hospital in Pilsen. She is the author and co-author of 35 articles.

Title:
Outcomes for Patients after Surgical Treatment of Liver Metastases from Breast Cancer - 19 years of experience

Authors:
Procházková, K.¹, Fichtl, J.³, Roušarová, M.³, Hošek, P.³, Pivovarčíková, K.², Hes, O.², Třeška, V.¹
¹Department of Surgery
²Department of Pathology
³Faculty of Medicine in Pilsen, Charles University and University Hospital, Pilsen, Czech Republic

Abstract:
Prognostic factors after surgical treatment of breast cancer liver metastases (BCLM) are still unclear. The aim of this study was to determine the long-term results and prognostic factors following surgery of BCLM. Thirty female patients underwent surgery for BCLM between 2000 and 2019. The clinical characteristics, type of surgery, histopathology results and follow up data were recorded. Liver metastases (LMs) developed after a median of 57.6 months. The median size was 30mm. In 11 cases (36.7%) liver resection, RFA in 12 patients (40.0%), both in 4 cases (13.3%) and exploration in 3 cases (10%) was performed. The median follow-up was 66.0 months. The number of LMs>1 (p=0.003), the expression of HER2/neu in LMs (p=0.034), a higher level of CA 19-9 before (p=0.017) and TK after surgery (p=0.034) were a negative prognostic factor for RFS (3- and 5-yr RFS was 15.1% and 6.2%, respectively). The factors affecting OS included the number of liver procedures (p=0.021), the degree of MIB1 activity in breast tumour (p=0.008) and a higher level of CEA after liver surgery (p=0.038); 3- and 5-yr OS was 67.6% and 39.3%, respectively. The type of surgery (resection/RFA) had no impact on OS. Repeat surgery of LMs provided higher survival rates. The markers and hormonal status (also of LMs) are factors that must be taken into account.

Supported by a grant of the Ministry of Health of the Czech Republic – Conceptual Development of Research Organization (Faculty Hospital in Pilsen – FNPL,00669806) and Research Project Q 39 - PROGRES, Charles University in Prague.
Radchenko, Dariia

Biography:
Biotechnology Master’s Student (CEMBIO, University of Bonn)
Field of interest: pharmaceutical microbiology, microbiome research, antibiotic resistance. Education:
University Of Bonn (Germany), 2018 – present, Molecular Biology and Biotechnology (M. Sc., English-taught program); University Of Wrocław (Poland), 2015 – 2018, Biotechnology (B.Sc., English-taught program), Studies focused on molecular and cell biology, biochemistry, genetics, animal and plant biology.
Experience: Student, 2017 – 2018, University of Wrocław, Biotransformation Department, Practical Bachelor’s thesis -Inadvertent effects of using doxycycline for the repression of tet-racycline promoter on Candida albicans drug resistance and virulence, Intern 2017 – 2017; University of Wrocław, Biotransformation Department, Assistance in project on the influence of novel drugs on Candida albicans drug resistance
Volunteer: 2016 – 2017, Ludwik Hirszfeld Institute of Immunology and and Experimental Therapy, Assistance in molecular cloning
dariaradchenko109@gmail.com

Title:
Microbiome in leanness – Predictive, Preventive and Personalised Approach

Authors:
Radchenko, D.1, Bubnov, R.2,3, Golubnitschaja, O.4,5,6
1Center of Molecular Biotechnology, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
2Clinical hospital ‘Pheophania’ of State Affairs Department, Ukraine
3Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine
4Radiological Clinic, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
5Breast Cancer Research Centre, Rheinische Friedrich-Wilhelms-University of Bonn, Germany
6Centre for Integrated Oncology, Cologne-Bonn, Rheinische Friedrich-Wilhelms-University of Bonn, Germany

Abstract:
Microbiome research is amongst most innovative fields in biomedical sciences being referred to as a second genome [1-3].
Modern society of the 21st century faced the epidemic of obesity and associated comorbidities. Therefore, the obesity specific microbiome has been prioritized for extensive studies demonstrating human microbiota as affecting the thermogenesis, energy balance and even food consuming behaviour, amongst others. Although currently less explored, the microbiota specific for lean people demonstrates its clear particularities and deviations compared to people with both – normal and increased BMI [2]. Specificaly in the context of predictive, preventive and personalised medicine, EPMA expert group has strongly contributed to the recent knowledge accumulated towards leanness specific microbiota [3,4]. The most
comprehensive updates to the topic are provided in the EPMA / Springer book “Flammer Syndrome - From Phenotype to Associated Pathologies, Prediction, Prevention and Personalisation” [5].

Current study is designed to correlate the leanness and particularly the Flammer Syndrome (FS) phenotype (anorexia nervosa as an extreme case of FS) with particularities of their microbiome profiles. FS phenotype associated symptoms and complications are considered by the patient stratification, namely:

- primary vascular dysregulation
- altered regulation of senses (thirst, pain, smell etc.) and sensitivity towards medications
- altered circadian rhythms and sleep patterns
- psychological and psychiatric aspects (e.g. tendency to meticulous personality and depression)
- increased incidence of dry mouth and sicca syndrome
- more prevalent impaired wound healing

as well as a predisposition to young stroke and aggressive metastatic cancer subtypes in the family, amongst others [6-10].

References

Rajdl, Daniel, M.D., Ph.D.

Biography:
Daniel Rajdl graduated from Charles University, Faculty of Medicine in Pilsen in 2001. He took a Ph.D. degree in 2005 at Charles University, Faculty of Medicine in Pilsen with the doctoral thesis: “Lipid metabolism and oxidative stress during pregnancy, labour and in early postnatal phases of human postnatal development and its relation to risk factors of atherosclerosis”. Nowadays, he works as a vice head for education and research of the Department of Clinical Chemistry and Hematology and teaches Clinical Biochemistry at the Faculty of Medicine in Pilsen. He participates in research regarding markers of tissue damage in diagnosis and prognosis of different diseases. He is an author of more than 50 articles in medical journals with more than 350 citations in available literature, H-index 9.

Title:
Predictive role of cardiac troponins in acute and chronic settings

Authors:
Rajdl, D., Racek, J.

1Department Clinical Biochemistry and Laboratory Medicine, Faculty of Medicine in Pilsen, Charles University and University Hospital in Pilsen, Czech Republic

Abstract:
Cardiac troponins have a well-established role in the diagnosis of acute myocardial infarction. Using of cardiac troponins for prediction of acute and chronic outcomes is becoming more and more popular. However, clinically accepted algorithms utilizing predictive role of cardiac troponins are still missing despite of strong evidence. The purpose of this review is to provide a comprehensive overview of current evidence in this area and to summarize promising approaches to clinically utilize predictive role of cardiac troponins. Large-scale clinical trials with high-risk (HOPE study) and stable coronary artery disease (CAD; PEACE study) patients and with general healthy population without CAD (HUNT 2 and 3, ARIC) were performed. Recorded primary clinical adverse outcomes ranged from non-fatal and fatal CAD, ictus, hospitalization for heart failure and death. It is for example evident that triage based on ESC 2015 1-hour algorithm for diagnosis of acute myocardial infarction effectively sorts patients with chest pain to high, moderate and low-risk groups in the sense of both incident heart failure risk and death (p < 0.001 for both outcomes). HUNT and ARIC studies with general healthy population without CAD showed that prediction of adverse outcomes based on cardiac troponins levels is more effective for younger patients and for women, in the population older than 75 years, the influence of age overwhelms predictive power of cardiac troponins. Interestingly, cardiac troponin I and T don’t correlate well in chronical states and it seems that each cardiac troponin can have its independent predictive power.
Abstract:
Prostate cancer (PCa) is the most commonly diagnosed malignancy and the fifth leading cause of cancer-related death among males in western countries. PCa is diagnosed by histological inspection of prostate needle biopsies, generally indicated by an elevated serum prostate specific antigen (PSA) test and/or a suspect digital rectal examination (DRE). Problem is that PSA has low specificity for PCa while biopsies have high false negative rates and often must be repeated. Moreover, currently available prognostic indicators (mainly PSA, Gleason score and tumour stage) cannot accurately predict PC aggressiveness at the time of diagnosis which has led to overtreatment of many indolent PCas. There is a need for new molecular biomarkers that can improve the accuracy of PC detection and better distinguish aggressive PCas.

MicroRNAs are abundant class of small non-coding RNAs which control gene expression at the posttranscriptional level. Deregulated miRNA expression has been associated with tumor progression in several cancer types. Stable miRNAs can find in biofluids, such as serum and plasma; thus the measurement of PCa-associated miRNAs can be emerging as a non-invasive tool for PCa detection and monitoring.

There are many candidates that can be used to predict PCa (miR-21, miR-200b, miR-429), as a prognostic marker (miR-141, miR-221, miR-375) or as a diagnostic marker (miR-106a, miR-200c). These biomarkers could improve patient care and capture the disease at an early stage.
Safonicheva, Olga G., Professor

Biography:
Professor at the Department of Integrative Medicine, Institute of Post-graduate Education for Doctors in First Moscow State Medical University (I.M. Sechenov University). MBA

Olga G. Safonicheva graduated from the State Krasnodar Medical University, Faculty of Internal Medicine in 1997, Russia. She took her PhD. Degree in 2007 at Moscow State Medical University, Faculty of Integrative Medicine with the doctoral thesis: Rehabilitation of structural and functional disorders of the musculoskeletal system (pre-clinical diagnosis and complex treatment for emotional/stress-induced disorders).

Certifications in neurology, neurophysiology, rehabilitation, physiotherapy. Member of the International Academy of Authors of Scientific Discoveries and the European Federation of Neuroscience (FENS). She teaches neurology and methods of integrative medicine. She participate in research regarding interdisciplinary approach to the study of brain development and plasticity; markers of cognitive control. She is author of educational technologies and projects, author of 6 patents, more than 60 scientific works, including 2 monographs with more than 370 citations in available literature. H-index 9.

Title:

New approach to early multi-level diagnosis and correction of neurodegenerative diseases

Authors:

Safonicheva, O. G., Smekalkina, L. V., Naprienko, M. V.

Department of Integrative Medicine, Institute of Post-graduate Education for Doctors, First Moscow State Medical University (I.M. Sechenov University), Russian Federation

Abstract:

Significant growth of cognitive impairment and neurodegenerative diseases in the elderly is important challenge for European public healthcare systems. So, creation of new protocol for early detection, personalized prevention, treatment, better control of neurodegenerative diseases is actual up-to-date medical and social problem.

Materials:

Our study covered both – men and women (125 patients, age of 48±6 years) with “office syndrome” (combined mild cognitive and somatic disorders).

Methods of multi-level examination:

Included neuropsychological, neurological tests and Instrumental visualization to detect the cognitive sphere, emotional status, postural balance, cerebral metabolism and adaptation capacities of the brain. Main treatment goals were: to work out personalized programs of rehabilitation for patients to restore self-regulation mechanisms, improve the cerebral metabolism and brain plasticity.
Results:
Clinical neurological examination revealed «tunnel» neurovascular disorders in cervical spine and postural displacement - « syndromes of uncompleted movements» in all patients. Neuro-energo-cartography (NEC) method of visualization indicated cerebral acidosis and brain hypoxia in 64 % of patients. The programs of personalised correction of postural, neurovascular disturbances included methods of academic drug therapies and conventional therapies: connective - tissue techniques, osteopathy; postural and breathing gymnastics, VR – technologies. Recommendations in lifestyle modification were given.

Conclusions:
New approach, including postural tests, study of cerebral metabolism may result in earlier disease detection, creation of effective personalized programs of prevention and treatment can motivate the patients for personal responsibility of their own health.

Method of NEC visualization

![Method of NEC visualization](image1)

Picture 1. Cerebral acidosis in patient of 48 aged.

![Method of NEC visualization](image2)

Picture 2. Cerebral acidosis decreasing after treatment in patient.
Title:

New concept of Preventive Medicine Centers in XXI Century

Authors:
Safonicheva, O., Ovchinnikova, M., Golubnitschaja, O.

Abstract:
At the beginning of 20th century, infectious diseases associated with environment, were the cause of high morbidity and mortality in industrial cities. At the beginning of the 21st century, high level of urbanization and urban buildings have already caused another kind of problems – non-communicable diseases. So, creation of new concept for Family Preventive Personalized Center is scientific ambition of the XXI century. Buildings for 4P - Medicine Centers with salutogenic design, new architectural solution have to become sources of health and Centers of Attraction where health -, social-oriented events, festivals, scientific and developing projects are held.
We suppose to extend the list of departments in the Preventive Medicine Center to cover research, education, creativity and other solutions for health.
The Research Department may propose preclinical predictive diagnosis with different tests for detection of mental, physical, somatic health and working out personalized preventive programs. Department of Education have to organize education through the life - courses in health management and holistic medicine: to learn fundamental laws of healthy lifestyle as well as conditions to health support for creativity, professional realization. Department of art-therapy and communications may include spaces for self-expression in paint-, music-, dance - therapy for brain plasticity. Department of physical activity we include to develop movement skills and measure the level of loadings.
Salutogenic design, new friendly architecture are the best solutions for Centers in preventive personalised and participative medicine for transforming them into the Centers of Science, Culture, Art and Well-being.
Role of soluble adhesion molecules in prediction of results of biological therapy in rheumatoid arthritis

Authors: Sarithala, V. J., Yagoda, A. V., Koroy, P. V.
1Department of hospital therapy, Stavropol State Medical University, Stavropol, Russia

Abstract: The aim of study is to assess relationship between blood levels of adhesion molecules and results of biological therapy in rheumatoid arthritis (RA). 35 patients with RA (29 women, 6 men) of age from 40 to 66 years, who were undergoing biological therapy (tocilizumab – 20 patients, etanercept – 15 patients) in combination with methotrexate were examined. Positive response on treatment was seen in 74.3% of patients, in 25.7% of cases treatment was ineffective. Control group consisted of 70 healthy individuals. Blood concentration of intercellular adhesion molecule-1 (ICAM-1), vascular cell adhesion molecule-1 (VCAM-1), platelet-endothelial cell adhesion molecule-1 (PECAM-1) E-, P- and L-selectins was carried out by means of ELISA before and after 12 weeks of treatment. Diagnostic value of parameters defined by their accuracy (Ac). In RA, increase in levels of all molecules of immunoglobulin superfamily, P-selectin was observed. In patients with positive results for therapy, normalization of ICAM-1, P-selectin and decrease of VCAM-1, PECAM-1 were observed. In patients with no effect for treatment, only concentration of ICAM-1 was reduced. Concentration of ICAM-1 above 886 ng/ml, PECAM-1 above 101 ng/ml, E-selectin below 40 ng/ml, P-selectin below 176 ng/ml was associated with increased chance of responding to biological therapy. This values of ICAM-1 (Ac 88.6%), P-selectin (Ac 82.9%), PECAM-1 (Ac 71.4%) characterized with high accuracy in delineation of treatment results. Here by conclude that increased blood concentration of adhesion molecules in RA was decreased in dynamics of biological therapy. Initial adhesins levels can be used as predictors of treatment outcomes in RA.
Sedláčková, Hana, M.D.

Biography:
Hana Sedlackova graduated from Charles University, Faculty of Medicine in Pilsen in 2016. She is a postgraduate (PhD) student at Department of Urology, Medical Faculty and Charles University Hospital Pilsen, Czech Republic. She is in the third year of her residency. The aim of her study is modern diagnostic methods in prostate cancer. She focus on MRI / TRUS software-based fusion targeted biopsy of prostate, use of prostate health index to indicate patients to prostate biopsy and than to radical prostatectomy with/without pelvic lymph node dissection. Finally, we have available a 68 Gallium-labelled prostate-specific membrane antigen ligand (68Ga-PSMA-11) for PET/MRI (PET/CT) in our hospital. Based on our results, we are trying create a new diagnostic algorithm for prostate cancer. As a doctoral student, she actively participate annual conferences both in the Czech republic and abroad, yearly. She is also involved in the teaching of medical students.

Title:
The diagnostic and therapeutic prostate cancer algorithm

Authors:
Sedlackova, H., Dolejsova, O.
Department of Urology, University Hospital in Pilsen, Czech Republic

Abstract:
The aim of the presentation is to introduce the diagnostic algorithm for prostate cancer patient management created in our department. In total of 320 patients who underwent prostate biopsy were studied. We focused on the tumor markers PSA and PHI. The median of PHI was calculated and correlated with the Gleason score (GS). As the next point, the sensitivity of mpMRI in differentiation between T3 and T2 category was assessed. The performance of MRI/TRUS fusion software-based targeted biopsy was evaluated. In a selected group of patients we performed 18F-Choline and newly 68Ga-PSMA-11 PET / MR as part of comprehensive staging before radical prostatectomy, but also in primary diagnostics before histological verification. Also the sensitivity of 18F-choline PET / MRI and 68Ga-PSMA-11 PET / MR in detection of metastasis were evaluated. In conclusion, we demonstrated a statistically significant ability of new tumor marker PHI to distinguishing the low-risk and aggressive carcinoma. The mpMRI is beneficial for local staging, but we noted a high specificity but low sensitivity of mpMRI in the detection of pT3 staging and seminal vesicle invasion. In a subset of high-risk patients, who underwent 18F-Cholin PET / MRI, we did not recognize the benefit for the detection of lymph node micrometastases, whereas 68Ga-PSMA-11 improved the detection. We used the results to specify the diagnostic and therapeutic prostate cancer algorithm.
Abstract:

We are trying to create a new diagnostic algorithm for prostate cancer. As a doctoral student, she actively worked on this topic. She focused on the tumor markers PSA and PHI. The median of PHI was calculated and correlated with the Gleason score (GS). As the next point, the sensitivity of mpMRI in differentiation of prostate cancer was assessed. The performance of MRI/TRUS fusion software of her study is modern diagnostic methods in prostate cancer. She focused on the tumor markers PSA and PHI. The median of PHI was calculated and correlated with the Gleason score (GS). As the next point, the sensitivity of mpMRI in differentiation of prostate cancer was assessed. The present chapter presents a review of the scientific literature related to the major symptoms and manifestations of prostate cancer, including low blood pressure, cold hands and feet, decreased thirst sensation, shifted circadian rhythm and prolonged sleep onset time, increased sensitivity to pain, migraines, tinnitus, and glaucoma. Considering that each of the symptoms imposes both direct and indirect risks to organ function and general health, each warrants a specific preventive approach and markers for continuous evaluation and follow-up.

The relevance of dietary intervention in prostate cancer is related to the multilevel impact of nutrition. The approach described here addresses specific symptoms, but with notable overlap and general effects due to shared physiological mechanisms expressed in the syndrome.
Shurygina, Irina, Professor

Biography:

Since 2018, holds the position of Professor of the Department of Ophthalmology, Rostov State Medical University. I lecture on vascular pathology of the retina and optic nerve. Scientific supervisor of the topic of neurodegenerative diseases of the organ of vision. Author of more than 50 articles in medical journals. H-index 3.

Title:
Personalized approach in assessing the progressive course of non-glaucomatous optic nerve atrophy

Authors:
Shurygina, I.1, Egiazarova, A. G.2

1Federal State Budget Educational Institution of Higher Education of Rostov State Medical University of the Ministry of Health of Russia (Federal State Budgetary Educational Institution of Higher Education “Rostov State Medical University” of the Ministry of Health of the Russian Federation)
2Municipal Public Health Institution Clinical Diagnostic Center “Zdorovie”, Russian Federation

Abstract:
Material and methods:
Two groups of patients with non-glaucomatous optic nerve atrophy (NGA) were identified. The first group included 45 patients with a progressive course of the NGA, the second group consisted of 45 patients with a non-progressive course of the NGA. Each patient was examined in four segments of RNFL using optical coherent tomography (OCT) on a Cirrus HD-OCT instrument (Carl Zeiss Meditec, Inc.), with an assessment ONM and RNFL OU Analysis Optic Disc Cube analysis protocol 200 × 200. Dynamic individual control of the segmental parameters of the RNFL was carried out after six months for two years.

Results:
Patients of the first group there was a decrease in RNFL by 15% or more of the initial parameters in at least one RNFL segment. In the first group, 38 patients first recorded pathological thinning of RNFL, at least in one of the four RNFL segments and after six months there was a decrease in visual function. In 36 patients neurodegenerative changes predominated mainly in the temporal segment of RNFL, in 9 patients in the nasal segment of RNFL. In the second group stated the absence of negative dynamics and the stabilization of visual functions.

Conclusions and recommendations of the expert:
Our studies have determined that with the progression of the NGA, pathological thinning of the RNFL precedes the decline in visual function and may occur in one or more segments of the RNFL. The identification of selective segmental pathological thinning of RNFL is considered to be an important personalized criterion of the progressive course of the NGA.
**Simsone, Zane, MSc.biol.**

**Biography:**

Scientific assistant. Zane Simsone acquired her master’s degree in Biology at the University of Latvia, Faculty of Biology with the topic of master theses “Cancer stem cell antigen expression and cell population heterogeneity in breast cancer histological samples”. She started doctoral studies in 2012 at University of Latvia, Faculty of Biology in Riga with the investigation in the field of cancer population resistance to chemotherapy. She works at University of Latvia, Institute of Cardiology and Regenerative Medicine as scientific assistant. She is interested in cell developing and aging, cancer resistance, morphology of cancer cell population. Zane Simsone had received University of Latvia Council of Students grant for project: “The development of Breast cancer treatment efficiency prediction” in 2011-2012 and the second project “The origin of resistance after tumour treatment” is supported by University of Latvia Research Fund from SIA “Mikrotīkls”. Foundation of the University of Latvia is administrator of this donation in 2018-2020.

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**Title:**

**Anti-cancer agent resistant cell population characterization using multiple biomarkers**

**Authors:**

Simsone, Z.1, Freivalds, T.1, Harju, L.1, Bērziņš, J.1, Buķis, I.1

1University of Latvia, Institute of Cardiology and Regenerative Medicine, Riga

**Abstract:**

Tumour tissues are heterogeneous with polymorphic cell subpopulation in it. Cancer microcells developing were observed in cancer cell cultures undergoing treatment with conventional chemotherapy. Microcells are small (3-5µm), roundish, intensively DAPI or haematoxylin stained cell with small amount of cytoplasm. The highest number of microcells was observed 48h after applied stress using anticancer drugs - DOX (2.5µM) and PTX (0.6 mg/ml). Microcells presented high endocytosis ability and they possess high metabolic activity. The newly created microcells actively can uptake substances or particles extracellular as for example in case of plasmid with cloned GFP gene. One of the cell metabolic activity indicators is ALDH2 which also has prognostic significance in breast cancer. The anti-PCNA overexpression in microcells represent replication activity as well as DNA repairing after stress. The embryonic stem cell markers as NANOG and SOX2 are strongly expressed in microcells. Microcells developing are not tumour specific, they can be found in any cancer cell lines or tumour.

Using NANOG+/SOX2+/ALDH2+/Anti-PCNA+ markers and endocytosis ability to microcell fraction it is possible to evaluate anti-cancer drug resistance and therapy efficiency prognosis.

This project is supported by University of Latvia Donor SIA “Mikrotīkls”. Foundation of the University of Latvia is administrator of this donation.
Slouka, David, MD, Ph.D., MBA

Biography:
David Slouka graduated from Charles University, Faculty of Medicine in Pilsen in 1997. He finished his postgraduate studies at Charles University, Faculty of Medicine in Pilsen in 2014 with the work on the topic "Laser at Miniinvasive Surgery" and reached the title Ph.D. Since 2000, he has worked as a teacher at the Otorhinolaryngology department of Faculty of Medicine in Pilsen, since 2015 as the vice head of Science and Education and from 2017, he is the head of Otorhinolaryngology Faculty of Medicine and Teaching Hospital in Pilsen. David Slouka in his research is focused to sleep apnoe syndrome medicine and laser medicine. He is an author of more than 30 medical topics articles with more than 60 citations in available literature, H-index 5.

Title:
Biomarkers - a possibility for monitoring of obstructive sleep apnea syndrome?

Authors:
Slouka, D.¹, Kučera, R.², Betka, J.³, Gál, B.⁴, Topolčan, O.²
¹Charles University, Faculty of Medicine in Pilsen, Ear, Nose and Throat Department, Pilsen, Czech Republic
²Charles University, Faculty of Medicine in Pilsen, Department of Nuclear Medicine, Laboratory of Immunoanalysis, Pilsen, Czech Republic
³Charles University in Prague, 1st Faculty of Medicine, Department of Otorhinolaryngology and Head and Neck Surgery, Prag, Czech Republic
⁴Masaryk University, Faculty of Medicine, Department of Otorhinolaryngology and Head and Neck Surgery, Brno, Czech Republic

Abstract:
Sleep apnea syndrome – biomarkers - pentraxin-3

Introduction:
Sleep apnea syndrome affects approximately 4% of adult males and 2% of adult females. It is associated with significant cardio-, cerebrovascular, metabolic and hormonal comorbidities and ranks among the more expensive medical specialties due to the requirement of high-quality technical diagnostic and therapeutic equipment as well as well-educated and experienced personnel. The aim of this study is to detect the relationship between C-reactive protein (CRP), pentraxin-3 (PTX-3), interleukin 6 (IL6), high-sensitivity troponin I (hsTnI), brain natriuretic protein (BNP) and galectin-3 serum levels and obstructive sleep apnea syndrome.
Material and methodology:
A group of 146 patients with middle to severe obstructive sleep apnea syndrome (OSAS) were monitored, and the results were compared with the results from a control group of healthy individuals.

Results:
We assessed serum levels of the following biomarkers: CRP, PTX-3, IL6, hsTnI, BNP, and galectin-3. PTX-3 serum levels were statistically significantly higher (p<0.0001) in patients with OSAS, compared to controls. Statistical results related to the other biomarkers did not suggest any clinical value. ROC analysis showed that PTX-3 might be able to distinguish patients with OSAS from healthy individuals (AUC=7438).

Conclusion:
The elevation of PTX-3 serum levels is significantly associated with middle to severe obstructive sleep apnea syndrome. The PTX-3 biomarker appears to be a promising alternative method for sleep apnea syndrome investigations.
Title:

Personalization of preventive measures for the treatment of patients in the early postoperative period after cataract surgery

Authors:
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¹Sechenov First Moscow State Medical University (Sechenov University)
²Ophthalmology Department, Rostov Regional Clinical Hospital
³Department of Ophthalmology, Rostov State Medical University

Abstract:

Material and methods:
In 100 patients with cataract and myopia, phacoemulsification of the cataract was performed; intraocular lens was implanted. Before and on 2 day after operation, by optical coherence tomograph (OKT) was measured Total Area Average (TAA).

Results:
Main group (62 eyes), which had an increase in TAA of 10–20% of the initial parameters after operation. Another group (38 eyes), whose TAA value was normal range. Visometry on 2 days after surgery showed a lower maximum correctable visual acuity by an average of 0.1-0.2 in the main group compared with the group of patients with normal TAA values.

Conclusions:
Depending on the TAA parameters, patients were offered individual treatment regimen in the early postoperative period, which made it possible to prevent retinal complications in the late postoperative period, to reach a high visual result for 5-7 days after surgery.

Recommendations of the expert:
It is advisable to include an innovative diagnostic technique OCT with the assessment of the TAA parameter before the operation and on the 2-d day after cataract surgery, complicated by myopia, in order to carry out timely prevention of retinal complications and improve the quality of vision of patients.
Smirnova, Nadezhda Petrovna

Biography:
Neurologist, acupuncturist. Aspirant for the degree of Candidate of Medical Sciences at the Department of Integrative Medicine, I.M. Sechenov The First Moscow State Medical University (Sechenovskiy University), Moscow, Russia.

Smirnova Nadezhda Petrovna, successfully graduated from the Volgograd State Medical Institute in 1986, in 1992 clinical residency in nervous diseases. She dedicated her life to practical work with neurological patients. At the same time, she studied non-drug exposure methods to optimize drug therapy. She worked in the clinic for patients with borderline disorders for more than 20 years, where she studied patients with psychosomatic and stressful disorders. Currently, under the guidance of Dr. med., Professor A.A. Mikhailova conducts scientific work on the study of the influence of methods of reflexotherapy in the treatment of patients with combined pathology. The focus is on chronic cerebral ischemia, type 2 diabetes mellitus, depressive disorders.

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Title:
Ways to solve the problems of polymorbidity in the elderly with chronic cerebral ischemia associated with type 2 diabetes and depressive disorders.

Authors:
Smirnova, N. P., Mikhailova, A. A., Hrypunova, O. V.

I.M. Sechenov The First Moscow State Medical University (Sechenovskiy University), Moscow, Russia

Abstract:
Introduction:
Impaired blood supply to the frontal-subcortical areas during chronic cerebral ischemia due to the defeat of small vessels leads to a disturbance of mood-regulating structures, forming the pathogenetic basis for affective disorders. Thus, the question of how to simultaneously influence such related processes as microvascular hypoperfusion and depressive disorders is not yet resolved.

The aim of the work:
To evaluate the effect of acupuncture and pharmacopuncture antihomotoxic medications on the state of the microvasculature and psychological status of the elderly patients with chronic cerebral ischemia associated with type 2 diabetes and depressive disorders.

Materials and Methods:
In this prospective study involved 127 patients observed at the clinic neuroses. All patients received standard psychopharmacotherapy. Three subgroups of the main group received acupuncture, pharmacopuncture and the combination of acupuncture and pharmacopuncture. Control of vascular disorders was carried out in terms of Angioscopy bulbar conjunctiva, conjunctival microcirculation index was calculated (CMI). Analysis of psycho-emotional states produced via MMPI test, questionnaire 4DSQ. Indicators were recorded at the beginning of treatment, after 25-28 days and after 6 and 12 months.

Results:
The efficacy of treatment was evaluated in the study group was significantly higher than the control. There has been a more significant improvement in the CMI and the psycho-emotional state of patients in the three subgroups receiving complex treatment than in the control group. The test group showed extended effect compared with the control in catamnesis.

Conclusion:
The proposed method improves microcirculation in the system of the internal carotid artery. Dysgemia decreases of cortical-subcortical structures, leads to effective control of neurotic disorders, decreases anxiety, depression and somatization, prevents the development of side effects, increases the level of adaptive reactions.
Smirnova, Tatiana, Ing.

Biography:
Tatiana Smirnova is a Ph.D. student of biochemistry at the University of chemistry and technology in Prague (UCT). She has been involved in proteomics, namely mass spectrometry and 2D electrophoresis since her bachelor study. In her Ph.D. thesis she is focusing on proteomic analysis of bio-liquids of patients affected by carcinomas and neurodegenerative diseases. She explores plasma protein profiles of healthy and affected patients by carcinomas (pancreatic and hepatocellular carcinomas) and neurodegenerative diseases (Alzheimer and vascular dementia diseases).

Her supervisor is Associated Prof. Štěpánka Kučková, Ph.D., who is a Deputy Head of the Laboratory of Applied Proteomics at the Department of Biochemistry and Microbiology, UCT. As the first in the world, her group has explored the utilization of mass spectrometry for the identification of proteins in insoluble matrices (artworks, teeth, bones, hearth calcifications) since 2004. She is the author of 39 publications in refereed journals with 707 citations, H-index 16.

Title:
Development of a new proteomic-based method for rapid screening of pancreatic cancer

Authors:
Smirnova, T.¹, Králová, D.¹, Kučková, Š.¹

¹Department biochemistry and microbiology, University of Chemistry and Technology, Prague, Czech Republic

Abstract:
Pancreatic cancer (PC) is one of the most lethal human cancers and has represented one of the major unsolved health problems of the beginning of the 21st century. The treatment of patients with developed PC remains a challenge because more than 80% of patients are diagnosed at a late stage. Median survival is from 4 to 6 months and a 5-year survival is less than 5%. Over the years, the incidence of this disease in the Czech Republic is growing and mortality is almost identical to its incidence. In 2016, the Czech Republic was at the second place of the incidence of this disease in the world. Unfortunately, there are no specific biomarkers for PC yet.

This work is focused on early detection of PC. In the study, plasma samples of four groups of patients (with PC, long-term type II diabetes, fresh developed type II diabetes, and healthy control group) were used to identify group of proteins characteristic for this disease. To achieve this goal, the previously untested combination of proteomics techniques has been used. Particularly Matrix-Assisted Laser Desorption/Ionization – Time of Flight Mass Spectrometry with spectra analysis by Principal Component Analysis and Liquid Chromatography coupled to tandem Mass Spectrometry helped us to find the differences between the analysed groups. A successful distinguishing of a patient with benign microcystic adenoma from a group of patients with fresh developed type II diabetes will be shown. After the data evaluation the patient was asked to undergo medical examination and the adenoma was diagnosed.
Smokovski, Ivica

Biography:
Ivica Smokovski, MD, PhD is a certified Fellow in Endocrinology and Specialist in Internal Medicine at University Clinic of Endocrinology, Diabetes and Metabolic Disorders Skopje, and Associate Professor at Faculty of Medical Sciences, University Goce Delcev Stip.

Has extensive experience in Endocrinology and Diabetes Care from various perspectives and positions: as a Clinician at University Clinic, as a Medical Advisor in pharmaceutical industry, and serving as a Medical Advisor for Diabetes Care to the Minister of Health.

Has been instrumental in instituting, and serving as a member, of the first National Diabetes Committee, a body for creating National Diabetes Policies and National Diabetes Care Guidelines. His other activities include formation of National e-Health System related to Diabetes Care, covering total population of the country.

Has published numerous publications in national and international journals, and has been invited to speak at many domestic and international medical events.

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Title:
National eHealth System in Republic of North Macedonia - Platform for Preventive, Predictive and Personalized Metabolic Control in diabetes patients

Authors:
Smokovski, I.1,2, Milenkovic, T.1,3
1University Clinic of Endocrinology, Diabetes and Metabolic Disorders, Skopje, Republic of North Macedonia
2University Goce Delcev, Faculty of Medical Sciences, Stip, Republic of North Macedonia
3University Sts Cyrilus and Methodius, Medical Faculty, Skopje, Republic of North Macedonia

Abstract:
The National eHealth System (NeHS), as a Platform for Preventive, Predictive and Personalized metabolic control, covering the total population of Republic of North Macedonia - estimated to have the third highest diabetes prevalence in Europe - was analyzed for metabolic control parameters (HbA1c, BMI, Total Cholesterol (TC), LDL Cholesterol, Triglycerides (TG), Systolic (SBP) and Diastolic Blood Pressure (DBP)) in insulin-treated diabetes patients, with 01-May-2017 as a cut-off date.

From the total of 37,011 insulin-treated diabetes patients in the country, 16.8% were identified as having data in their Electronic Healthcare Records for any of the metabolic parameters. Majority of those patients (62.2%) were identified with inadequate glycemic control (HbA1c>7%); and 85.8% were overweight or obese (BMI>25 kg/m2). Furthermore, majority of patients were with inadequate lipid control (53.8% with TC>5 mmol/l, 67.0% with LDL>2.6 mmol/l, 59.1% with TG>1.7 mmol/l), whereas most of the patients were with adequate blood pressure control (22.0% with SBP>140 mmHg and 6.2% with DBP>90 mmHg).

These were the first results of metabolic control in insulin-treated diabetes patients derived from NeHS, suggesting a need for improvement of glycemic, weight and lipid control. Monitoring of metabolic control at national and individual level through NeHS confirms its value as a platform for prediction of diabetes related cardiovascular risk - primary cause for morbidity and mortality in these patients. In addition, it is a valuable platform for prevention of microvascular diabetes complications, and for enabling personalized metabolic control at an individual level for every citizen with diabetes in the country.
Springer, Drahomira, Ph.D., Associate Professor

Biography:
Drahomira Springer graduated from University of chemical technology, Major: Biochemistry in 1985. In 1994 she passed the Specialized examination of investigative methods in clinical Biochemistry and in 2003 Specialized examination of investigative methods in toxicology. She took a Ph.D. degree in 2009 at First Faculty of Medicine, Charles University in Prague with the doctoral thesis: “Investigation of thyroid disorder in pregnancy and reference intervals in evaluation of maternal thyroid function”. In 2016 she defended her habilitation work on the topic: “The use of immunoanalytical methods in the diagnosis of serious diseases” and took the degree of associate professor. Nowadays, she works in the Institute of Medical Biochemistry and Laboratory Medicine of the General University Hospital and teaches clinical biochemistry at the First Faculty of Medicine at the Charles University in Prague. She participates in the screening of Down syndrome and thyroid diseases in pregnancy. She is an author of more than 50 articles in medical journals with more than 180 citations in available literature, H-index 7.

Title:
Current status of Down syndrome screening

Authors:
Springer, D., Zima, T.

Institute of Medical Biochemistry and Laboratory Medicine, General University Hospital and First Faculty of Medicine, Charles University, Prague, Czech Republic

Abstract:
The basic postulate of high quality maternal-foetal care is the uncomplicated birth of a healthy baby to a healthy mother at term. Screening of pregnant women for the presence of foetal genetic aberration (Down’s or Edward’s syndrome) is possible to perform in the first or second trimester or in both. New screening tests derive benefits from presence of foetal DNA in the mother blood. Firstly (in the 1970s) was the risk of Down’s syndrome calculated only from the age of the mother. The eighties brought into second trimester screening AFP and total hCG, later also uE3 (unconjugated oestriol) and inhibin. In the nineties were started usage of new markers PAPP-A and free ß-hCG in the first trimester. Scan in 11-14 week of pregnancy confirm a viability, accurate date a pregnancy and mainly is used for measuring of nuchal translucency (NT).

First-trimester combined screening at 11 weeks of gestation has better detection rate (about 80 %) than second trimester screening (about 65%), both stepwise sequential screening and fully integrated screening have high rates of detection of Down’s syndrome (90 %), with low false positive rates. The full integrated test or the sequential integrated test is the safest, most cost-effective test currently available. The non-invasive prenatal test (NIPT) with the detection of cell free foetal DNA (cffDNA) is currently still methodically and financially demanding and as such not suitable as a general population screening test.
Title:

Possibilities and importance of screening thyroid disorders in pregnancy

Authors:

Springer, D., Zima, T.

Institute of Medical Biochemistry and Laboratory Medicine, General University Hospital and First Faculty of Medicine, Charles University, Prague, Czech Republic

Abstract:

There is a large scale of other screening tests in pregnancy: gestational risk in diabetes, infection (HIV, hepatitis and syphilis), rhesus factor and the other tests. Thyroid dysfunction in pregnancy is known to cause problems not only for the outcome of pregnancy, but also for the development of the foetus. The markers in the three laboratory tests (TSH, TPOAb and FT4) are used in the investigation, as each test yielded important information, independent of each other. In our group of 7,530 women in 9-11 week of pregnancy were determined TSH, anti TPOAb and FT4. In region with enough iodine supply occur a raised concentration of TSH was found in 5.14% of pregnant women; a suppression of TSH was found in 2.90%. Further there were 11.5% TPO-Ab positivity. Family or personal history of thyroid or autoimmune diseases were present in 58.3% all of them, in case of subclinical hypothyroidism it was only in 21.9% of them. Minimally 30-40% of pregnant women with positivity only in TPOAb, have after delivery some of thyroid disfunction World guidelines for management of thyroid dysfunction during pregnancy and postpartum recommend not universal but only case finding screening. Our results show relative high risk of thyreopathy in pregnancy and we strongly support screening programs for pregnant women early in gestation. The screening of thyroid dysfunction should be joint with the sampling for Down’s syndrome.
Biography:
David Suchý graduated from Charles University Prague, Faculty of Medicine in Pilsen – general medicine in 1995. He took a Ph.D. degree in 2009 at Palacky University, Faculty of Medicine in Olomouc with the doctoral thesis: “Pharmacokinetic of cyclosporine in patients with rheumatic diseases” He works as head of Dept. Of Clinical Pharmacology and also head of Independent Ethic Comitee of University Hospital in Pilsen. His specialisation include rheumatology and clinical pharmacology. He participates in research projects in the fields of early diagnosis of rheumatic diseases, treatment and personalised medicine focused on biomarkers in rheumatology in cooperation with Institute of Rheumatology Prague. He is an author and co-author of more than 40 articles in medical journals.

Title:
Biomarkers in rheumatology - possible applications

Authors:
Suchý, D.¹, Topolcan, O.², Fuchsova, R.², Windrichova, J.¹
¹Department of Clinical Pharmacology
²Department of Immunochemistry Diagnostics, University Hospital in Pilsen, Czech Republic

Abstract:
The aim:
To review current biomarkers for rheumatoid arthritis and utility in different stages of the disease

Methods:
The literature review of current biomarkers to aid in the diagnosis of RA and emerging predictive markers of prognosis, disease activity and treatment response.

Results:
Diagnostic biomarkers: The RA identification in early stages is essential to stop progression of disease. Established biomarkers include rheumatoid factor cyclic citrulinated peptide antibodies (anti-CCP). New biomarkers: include antibodies anti-MCV (mutated citrulinated vimentin) and 14-3-3 eta protein. Survivin measurements improve prediction of RA among patients with unexplained arthralgia.

Prognostic biomarkers: patient with high titers of rheumatoid factor (RF) and cyclic citrulinated peptide antibodies (anti CCP) usually develop more aggressive form of the disease. Galectin-3 correlated with MRI erosion score after 1 year of follow-up. Low leptin and elevated osteopontin (OPN) may be a new biomarker for erosive disease and bone loss in RA. The presence of other biomarkers was associated with more severe forms of RA, such as anti MCV, 14-3-3 eta proteins.

Disease activity monitoring: For a better monitoring of the disease activity, a test that includes several biomarkers under the name “multi-biomarkers disease activity test (MBDA)” has been developed”. Several authors have reported increased calprotectin serum levels in RA patients, its association with disease activity and its dynamic decrease after initiation of effective treatment.

Predictive biomarkers of the response to the antirheumatic therapy include RF positivity, anti CCP (tumor necrosis factor alpha inhibitors TNF i, rituximab) , high interleukin 6- levels (anti-IL6 therapy), anti MCV positivity(rituximab). Cartilage oligomeric matrix protein (COMP) and serum calprotectin and surviving were tested in patients treated with TNF inhibitors or rituximab.

Conclusion:
The identification of new biomarkers with a real clinical utility remain a major topics of interest in RA given the complexity and heterogeneous nature of RA, it is unlikely that a single cytokine may provide sufficient discrimination; therefore multiple biomarker signatures may represent more realistic approach for the future of personalized medicine in RA.
Svoboda, Tomas, M.D., Ph.D.

Biography:
Postgraduate study of Internal medicine finished in 2011 - Ph.D.
Educational activities: high school and university students since 1994
Editor of Czech version of The Lancet, assistant editor of other scientific journals and board member of Czech Klinická onkologie journal
Leader of Young Oncologists club since 2006 a an organise of yearly YOC meetings; Czech Republic representative in European scientific since 2006, mainly in the field of breast, prostate and colorectal cancers and supportive care; Czech Republic National Representative in ESMO since 2011, cooperating in WHO Global Task Force meetings
Membership: Czech Society for Oncology, Society of Radiation Oncology, Biology and Physics, ESMO

Title:
The influence of different treatment methods used in prostate cancer on PSA response with a special focus on radiation therapy

Authors:
Svoboda, T., Vasilev, K., Finek, J.
Department of Oncology and Radiotherapy, University Hospital in Pilsen, Czech Republic

Abstract:
Prostate cancer is the most common tumor in men and because of extremely rising incidence and prevalence it will become a big socioeconomic problem soon. PSA is a good biomarker for disease detection however not applicable to cancer screening today. It has some prognostic value and is usually used during follow-up as a marker of biochemical treatment failure associated with the tumor relapse or distant dissemination. There is a huge armamentarium of treatment methods used in prostate cancer such as endocrine blockade by LH-RH agonists or antagonists, taxane chemotherapy, modern androgen receptor targeted agents as systemic treatment or surgery and mainly radiation therapy as local treatment anytime during the disease course. Each treatment has a different impact on the PSA response, most importantly according to it´s rate. Interestingly, there is a unique radiation method using alpha radium for bone metastases with a typically rising PSA regardless of a good disease response, pain relieve in patient and improvement of overall survival. It is distinct from a standard external beam radiation use in this patients group. There is a difference in PSA decrease between both radical treatment methods – radiation therapy and surgery, too. In clinical practise a long-term PSA stabilisation seems often to be more important than to achieve an undetectable PSA level. Importantly, there is some distinction in perspective of PSA progression in patients followed after treatment with respect to their PS, tumor localisation and future treatment possibilities again.
Svobodová, Šárka, MD, PhD.

Biography:
She graduated at 1st Medical Faculty in Prague in 1993. During her studies she spent one year at UTHSCSA in San Antonio, Texas. She obtained the Internal Medicine– 1st degree specialization in 1998 and the licence for Internal Medicine in 2005. Since 2002 she has been working as an Internal Medicine Specialist at the 3rd Internal Medicine Clinic, General University Hospital, Prague: at Outpatient Clinic dedicated to metabolic syndrome and diabetes. She took a Ph.D. degree in 2009, with the doctoral thesis: “Regulation of parameters of biological activity of colorectal cancer.” She is also a research scientist at the Medical Faculty Charles University Pilsen, participating on issue of immunoanalytical methods.
She is a member of EPMA. She has published more than 40 publications in medical journals with more than 160 citations in available literature, H index: 9.

Title:
Diabetes mellitus and Polycystic Ovary Syndrome (PCOS).

Authors:
Svobodová, Š.1,2, Kučera, R.2, Topolčan, O.2
1III. Internal medicine clinic, General Faculty Hospital and 1st Medical Faculty, Charles University Prague, Czech Republic
2Dept. of Immunoanalysis, Faculty Hospital Pilsen and Medical Faculty, Charles University Prague, Czech Republic

Abstract:
Polycystic Ovary Syndrome (PCOS) represents one of most frequent endocrinology disorders in fertile females. Its prevalence rate is 5-15 % based on the diagnostic criteria used. It is one of the most common causes of abnormal menstrual cycle and infertility. It is not only a gynecology disorder because it is often accompanies by metabolic syndrome (diabetes mellitus, dyslipidemia, arterial hypertension and obesity). Metabolic syndrome results in accelerated atherosclerosis with higher cardiovascular morbidity rate. It seems that insulin resistance plays a key role and link between PCOS and metabolic syndrome and diabetes. Therefore a therapy is targeted to insulin resistance improvement and therapy of all the other parameters of metabolic syndrome.

PCOS represents a heterogenous disease with many factors: increased LH secretion in adenohypophysis, increased androgens production by ovaries, insulin resistance, increased insulin secretion and decreased growth hormones secretion.

Traditional ovary morphology examination using vaginal ultrasound can be complemented by serum biomarkers assessment – anti-Müllerian hormone (AMH), which correlates with the number of ovarian follicles, total testosterone and sex hormone binding globulin (SHBG).

50-60% patients with PCOS suffer from metabolic syndrome. It is therefore recommended to monitor all the other parameters for evaluation of cardiometabolic risk. Insulin resistance correlating with lower SHBG levels results in glucose metabolism disorders. It is therefore appropriate to monitor not only serum glucose levels but also serum levels of insulin and C-peptide, regular check of glycated hemoglobin (HbA1c) and also parameters of lipid metabolism.
Polycystic Ovary Syndrome (PCOS) represents one of the most frequent endocrinology disorders in fertile females. It is estimated that PCOS affects 15% of women of reproductive age. It seems that insulin resistance plays a key role and is linked to many factors: increased LH secretion in adrenohypophysis, increased androgen production of ovaries, insulin resistance, increased insulin production by ovaries, and metabolic syndrome. It was shown that 60% of patients with PCOS suffer from metabolic syndrome. It is therefore recommended to monitor not only serum glucose levels but also serum levels of insulin and C-peptide, regular check of ovaries, total testosterone and sex hormone binding globulin (SHBG).

Traditional ovary morphology examination using vaginal ultrasound can be complemented by serum biomarkers assessment. PCOS represents a heterogeneous disease with many factors: increased LH secretion in adrenohypophysis, increased androgen production of ovaries, insulin resistance, increased insulin production by ovaries, and metabolic syndrome. Metabolic syndrome results in accelerated atherosclerosis with higher cardiovascular morbidity rate. Polyhydramnios, obesity and diabetes mellitus are common problems associated with PCOS. Therefore, a therapy is targeted to insulin resistance as well as improvement and therapy of all the other parameters of metabolic syndrome.

Abstract:

Diabetes mellitus and Polycystic Ovary Syndrome (PCOS).

Svobodová, Š.

Authors:

Svobodová, Š., Kučera, O., Topolčan, R., Müllerová, J., Kyčerová, T., Šášková, M., Topolčan, R., Švábová, K., Kocába, R.

Biography:

Jana Svobodová, M.D., Ph.D., an author of more than 30 chemistry and nuclear medicine papers with approximately 800 citations. She is a member of EPMA. She has published more than 40 publications in medical journals with more than 160 citations in the available literature, H index: 9.

Dept. of Immunoanalysis, Faculty Hospital Pilsen and Medical Faculty, Charles University Prague, Faculty Charles University Pilsen, participating on issue of immunoanalytical methods.

Clinic, General University Hospital, Prague: at Outpatient Clinic dedicated cardiological medicine specialized in metabolic syndrome and diabetology.

One degree of specialization in 1998 and the licence for Internal Medicine in 2005. Since 2002 she has been working as an Internal Medicine Specialist at the 3rd Internal Medicine Clinic, General Faculty Hospital and 1st Medical Faculty, Charles University Prague.

She graduated at 1st Medical Faculty in Prague in 1993. During her studies she spent one year at UTHSCSA in San Antonio, Texas. She obtained the Internal Medicine licence in 2005. Since 2002 she has been working as an Internal Medicine Specialist at the 3rd Internal Medicine Clinic, General Faculty Hospital and 1st Medical Faculty, Charles University Prague, Czech Republic.

Future directions of prostate cancer theranostics

Authors:

Simecek, J.

Isotope Technologies Garching GmbH, Garching, Germany

Title:

Future directions of prostate cancer theranostics

Abstract:

Prostate cancer is one of the most abundant oncologic diseases in male population. Especially castration resistant prostate carcinoma brings difficult disease management, high costs and quite low overall survival rates despite wide use of registered pharmaceuticals being globally available. In spite of small PSMA inhibitors and their labelled derivatives have been known for almost two decades, their massive use had to await the advent of Ga-68 labelled peptidomimetic HBED-CC-PSMA (PSMA-11) in 2012. Shortly after that, different radiotherapeutic agents have been introduced, two of them based on β-emitter Lu-177 are in focus of nuclear medicine up to now, one agent in Phase III trial. The perfect match for these diagnostic and therapeutic agents lead to their worldwide use even before the market authorisation by EMA or FDA. Furthermore, treatment with alpha particle emitting nuclides, predominantly Ac-225, have recently been suggested as an option for patients in late stage of the disease, not responding to any other available therapy. The presented lecture will summarize different molecular probes for diagnostics with high predictive value for the treatment, currently preferred approaches to diagnostics and treatment of CRPCa, focus on current scientific progress and will discuss the future challenges for treatment of prostate carcinoma.
Štiavnická, Miriam

Biography:
Miriam Štiavnická is a Ph.D. student at Faculty of Medicine in Pilsen, Charles University. Her research interest is epigenetic in male reproduction. In the Laboratory of reproductive medicine she is trying to estimate epigenetic based sperm selection markers with the potential of application in assisted reproductive therapy. Moreover she participates in the project investigating endocrine disruptor effect of Bisphenol S (compound of daily used plastic items) on female and male reproductive health through observing epigenetic and cytoskeletal targets. Last year she spent eight months in the Laboratory of Prof. Peter Šutovsky at University of Missouri, where she studied effect of gasotransmitters on boar sperm capacitation.

Title:
Sperm histone code as a tool for personalized assessment of male fertility

Authors:
Štiavnická, M.1, García-Álvarez, O.2, Ulčová-Gallová, Z.3,4, Sutovsky, P.5,6, Abril-Parreño, L.7, Řimnáčová, H1, Králíčková, M.1,8, Nevolář, J.1,8

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2Health and Biotechnology (SaBio) Group, IREC (CSIC-UCLM- JCCM), Campus Universitario s.n., Albacete, Spain.
3Genetika Plzeň, s.r.o. (Ltd.), Pilsen – Černice, Czech Republic
4Department of Gynecology and Obstetrics, Charles University, Pilsen, Czech Republic
5Division of Animal Sciences, University of Missouri, Columbia, MO, USA
6Department of Obstetrics, Gynecology and Women’s Health, University of Missouri, Columbia, MO, USA
7Laboratory of Animal Reproduction, Department of Biological Sciences, School of Natural Sciences, Faculty of Science and Engineering, University of Limerick, Limerick, Ireland
8Department of Histology and Embryology, Faculty of Medicine in Pilsen, Charles University, Pilsen, Czech Republic.

Abstract:
Sperm uniqueness comes from their chromatin that in comparison to other cells, is mostly created by protamines. This provides to sperm highly condensed chromatin, unable of other transcription However, approximately 15% of differently modified histones, responsible for genes expression connected with embryo development, are still present in mature spermatozoa. Hence, histone modifications seem to be promising indicator of spermatozoa quality.

Accordingly, we have selected dimethylation of histone 3 at lysine 4 (H3K4me2), participating in chromatin opening during protamination and overexpressing in round spermatids, as promising indicator of sperm quality. We analysed 99 human samples with different sperm quality for concentration, motility, DNA fragmentation (%DFI) and chromatin immaturity (%HDS), concurrently with H3K4me2 analysis by flow cytometry.

We observed the association of spermatozoa immaturity (HDS) and the manifestation of H3K4me2 (r=0.47; p<0.001), with respect to individual spermiogram. Our results highlighted the importance of considering chromatin immaturity and histone code assessment, in advanced evaluation of sperm quality and thus personalize male infertility treatment.

This work was supported by Charles University Research Fund (PROGRES Q39), the National Sustainability Programme I (NPU I) Nr. LO1503 provided by the Ministry of Education, Youth and Sports of the Czech Republic (MEYS CR), University of Castilla-La Mancha and Junta de Comunidades de Castilla-La Mancha (SBPLY/17/180501/000470), Agriculture and Food Research Initiative Competitive Grant no. 2015-67015-23231 from the USDA NIFA, and supported by seed funding from the University of Missouri Food for the 21st Century Program.
Title:

Educational activity on stroke focused on the adolescent population

Authors:

Štibrana, K.,1 Stela, J.,1 Polivka, J.,1,2,5 Rohan, V.,1,2,5 Polivka, J. Jr1,2,3,4,5

1Faculty of Medicine in Pilsen, Charles University
2Department of Neurology
3Department of Histology and Embryology
4Biomedical Center
5University Hospital Pilsen, Department of Neurology

Abstract:

Education is a key tool for a voluntary prevention of a variety of diseases, optimally in early childhood to enable a long-term lifestyle improvement. Furthermore, education is important for detection of clinical signs and an adequate proceeding. Strokes are diseases with serious social and health concerning consequences and a high morbidity and mortality rate. They are an ideal topic for education and prevention, optimally in young population. The goal for this project was to realize education and to obtain quantitative and qualitative information about previous awareness of stroke, lifestyle, health status and health status of family members in young population sample. The special lectures were conducted for 356 students (age range 14 - 18 years) at four different high schools in the West Bohemia area. The students were asked to fill out an anonymous online questionnaire followed by power point presentation on stroke and discussion. Validation was done by fulfilling the first part of questionnaire 14 days later. Only 33% of students had previous knowledge about stroke, only 11% knew how to react. 47% of females did not know relationship between smoking and hormonal contraception. More than a third did not know or did not care about their glucose and lipid metabolism. An improvement of knowledge was detectable within 81% students, 37% discussed it within their family and 7% showed the presentation to their family members. 87% of students thought of the educative program as beneficial, 7% had a neutral posture and 5% perceived it as useless harassment. 74% agreed to the fact that a healthy lifestyle is of importance, 18% were not sure and only 8% of students considered any measures and lifestyle restrictions unnecessary.
Tachalov, Vadim, Ph.D., Associate Professor

Biography:
Vadim Tachalov graduated from Pavlov First Saint Petersburg State Medical University in Saint Petersburg in 2003. He took a Ph.D. degree in 2010 at Pavlov First Saint Petersburg State Medical University in Saint Petersburg with the doctoral thesis: “Features of oral hygiene in the complex treatment of periodontal diseases after surgery using platelet rich autologous blood plasma”. In November 2018 he took the degree of associate professor. Nowadays, he works as a vice head of the Department of Therapeutic Dentistry and Periodontology and teaches Therapeutic Dentistry at the Faculty of Dentistry at Pavlov First Saint Petersburg State Medical University in Saint Petersburg. He participates in research regarding psychological traits of periodontal patients influencing their adherence to treatment. He is an author of more than 24 articles in medical journals with more than 100 citations in available literature, H-index 1.
tachalov@mail.ru

Title:
Emotional Self-Regulation and its Relation to Quality of Individual Oral Care

Authors:
Tachalov, V. V.2, Orekhova, L. Yu.1,2, Kuchumova, E. D.1,2, Sitkina, E. V.3
1City Periodontology Center
2The Department of Therapeutic Dentistry and Periodontology, Pavlov First Saint Petersburg State Medical University
3The Department of General and Clinical Psychology, Pavlov First Saint Petersburg State Medical University

Abstract:
Abstract was conducted with the use of the following psychodiagnostics methods: (1) Leonhard-Smishek Characterological Questionnaire (version for adults); (2) Individual Typological Questionnaire by L.N. Sobchick (ITQ). The Green-Vermillion Index was defined at the beginning of the study and upon its completion (in a month). The group 1 patients demonstrated negative dynamics – deterioration of their oral cavity status (increase of the Green-Vermillion index by the end of the study). The group 2 patients demonstrated positive dynamics – improvement of their oral hygiene status (decrease of the Green-Vermillion index by the end of the study).

Group 1 patients noticed bleeding gums more often (0.82±0.39) than Group 2 representatives (0.28±0.45), which may be explained by poorer oral hygiene in Group 2.

Statistically significant differences between Groups 1 and 2 were also defined by the level of patients’ emotional lability (disequilibrium): in Group 1, affective-exalted type of a person was registered more often (19.05±4.85) than in Group 2 (13.30 ±6.07).

Statistically significant differences between Groups 1 and 2 were also defined by the parameter “hyperthymic type of a person”: the value of this indicator was higher in Group 1 (16.05±3.17) than in Group 2 (12.44±6.0).

The study shows that such psychological parameters as emotional lability, increased emotional self-regulation and anxiety (concern) about the treatment results, are linked to the quality of individual oral care.
Title:
D vitamin and pregnancy
Authors:
Topolčan, O., Kučera, R., Novotný, Z., Fuchsová, R., Svobodova, Š., Šimánek, V.
Faculty Hospital Pilsen and Medical Faculty, Charles University, Czech Republic
Abstract:
The role of vitamin D its classical function in calcium homeostasis has been of significant interest in recent years. There has been expanding research on the role of vitamin D in pregnancy. Several studies demonstrate the association between low maternal vitamin D statuses to adverse outcomes in pregnancy, including preeclampsia, gestational diabetes, preterm births, low birth weight, and others. Several randomized controlled clinical trials of Vitamin D supplementation during pregnancy have also been conducted. In some studies improvement in pregnancy outcomes with vitamin D supplementation was found, others have not shown any association. In this presentation, we have critically reviewed the studies, published within the past ten years on the influence of vitamin D deficiency on pregnancy and the impact of its supplementation. The potential mechanisms of vitamin D in regulating each of the outcomes have so been discussed.
Title:

PHI and related case reports

Authors:

Topolčan, O., Kučera, R., Dolejšová, O., Hora, M., Fuchsová, R., Svobodová, Š., Šimánek, V.
Dept. of Immunoanalysis, Faculty Hospital Pilsen and Medical Faculty, Charles University, Czech Republic

Abstract:

Aim:
The purpose of this study was to investigate the Prostate Health Index as a marker for tumor aggressiveness in prostate biopsy and the optimization of indication for treatment options.

Methods:
Our cohort consisted of 320 patients indicated for radical prostatectomy with preoperative measurements of total prostate-specific antigen, free prostate-specific antigen, [-2]proPSA, calculated %freePSA, and Prostate Health Index. The Gleason score was determined during biopsy and after radical prostatectomy.

Results:
The significance of the individual parameters for estimation of aggressiveness and value variability will be demonstrated. The main purpose is to demonstrate laboratory results not corresponding with postoperative Gleason score evaluation.

Conclusion:
The Prostate Health Index (PHI) positively correlates with tumor volume, extraprostatic disease extent and higher Gleason grade tumors.
Title: PHI and related case reports
Authors: Topolčan, O., Kučera, R., Dolejšová, O., Hora, M., Fuchsová, R., Svobodová, Š., Šimánek, V.
Dept. of Immunoanalysis, Faculty Hospital Pilsen and Medical Faculty, Charles University, Czech Republic

Abstract:
Aim: The purpose of this study was to investigate the Prostate Health Index as a marker for tumor aggressiveness in prostate biopsy and the optimization of indication for treatment options.

Methods: Our cohort consisted of 320 patients indicated for radical prostatectomy with preoperative measurements of total prostate-specific antigen, free prostate-specific antigen, [2]proPSA, calculated %freePSA, and Prostate Health Index. The Gleason score was determined during biopsy and after radical prostatectomy.

Results: The significance of the individual parameters for estimation of aggressiveness and value variability will be demonstrated. The main purpose is to demonstrate laboratory results not corresponding with postoperative Gleason score evaluation.

Conclusion: The Prostate Health Index (PHI) positively correlates with tumor volume, extraprostatic disease extent and higher Gleason grade tumors.

Title: Mesenchymal Stem Cell Application in Combination with Portal Vein Embolization is an Effective Method for Increase Future Liver Remnant Volume in Primary Non-resectable Colorectal Liver Metastases.
Authors: Treska, V.1, Skalicky, T.1, Fichtl, J.1, Lysak, D.2, Bruha, J.1, Ferda, J.3, Kucera, R.4, Topolcan, O.4
1Department of Surgery
2Department of Hematooncology
3Department of Radiology
4Immuno-diagnostic Department
School of Medicine, Pilsen, Czech Republic

Abstract:
Insufficient future liver remnant volume (FLRV) is the main cause of colorectal liver metastases (CLM) non-resectability. Portal vein embolization (PVE) alone is not sufficient for FLRV growth in more than 30% of patients. The effect of combination of PVE with application of autologous mesenchymal stem cells (aMSC) for FLRV growth acceleration was evaluated in patients with primary non-resectable CLM. PVE with application of bone marrow aMSC was used in 29 patients with primary non-resectable CLM. FLRV growth was evaluated by computed tomography volumometry and liver resection was performed as soon as FLRV was sufficient. FLRV growth, percentage of CLM resectability, long-term overall survival (OS) and progression free survival (PFS), risk factors for long-term results were evaluated. FLRV growth was sufficient in all patients during 3-4 weeks after procedure (CT volumetry before and after was 521.2 ± 159.7 versus 675.5 ± 148.6 mm3 – p˂0.0002). There was zero mortality and only 3.6% morbidity rate, R0 hepatectomy was performed in 24 (82.8 %), exploratory laparotomy in five patients (4x tumor progression, 1x severe adhesions). One and three years OS was 88.1, resp. 68.7 %, PFS 67.2, resp.32.1% in patients after liver resection. Negative prognostic factors for OS were CLM volume (p<0.01) and the right site localization of primary tumor (p ˂ 0.05).Growth of CLM volume was found in 19 (65.6 %) of patients (59.7 ± 91.7 versus 94.6 ± 156.8 mm3 p< 0.00009) and was significant for OS. aMSC application together with PVE is a safe and promising method for FLRV growth in patients with primary non-resectable CLM.

This study was supported by the grant of Ministry of Health of the Czech Republic – Conceptual Development of Research Organization (Faculty Hospital in Pilsen – FNPL,00669806) and Research Project Q 39 - PROGRES, Charles University in Prague.
Treskova, Inka

Biography:
Plastic surgeon Inka Treskova graduated in 2007. She is Head of the Department of Plastic Surgery, University Hospital, School of Medicine in Pilsen, Czech Republic. Her specialization is breast surgery and reconstruction, oncosurgery and microsurgery.

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Title:
**Individual surgical approach in management of BRCA mutation carriers – experience of our center**

Authors:
Treskova, I., Zednikova, I., Hosnedlova, A., Subrt, I., Presl, J., Kydlicek, T.

1Department of Plastic Surgery
2Department of Surgery
3Department of Genetics
4Department of Gynaecology

Abstract:
In recent years, there has been growing interest in identifying women with hereditary predisposition for breast cancer. With increasing number of women tested for BRCA mutation there is also increasing need to improve management strategy in reducing the risk of breast and ovarian cancer for BRCA mutation carriers. The BRCA mutation carriers in our country can consider two options to reduce risk: surveillance or risk-reducing surgery. The decision-making process is very complex. Yet, no randomized trials have specifically assessed the efficacy of these options. We followed the decision-making process in our patients. During the years 2014-2018 we performed the prophylactic surgery in 70 BRCA mutation carriers. We performed nipple-sparing mastectomy or skin-sparing mastectomy in 41% or 59% respectively. In 96% of cases we performed immediate reconstruction with silicone implants or tissue expanders. We found that as the patient is well informed she tends to choose the risk-reducing surgery rather than surveillance. Our patients are more focused on surgical radicality rather than esthetic outcome. In contrast to published data where nipple sparing mastectomy is seen to be an optimal surgical procedure, our patients choose skin-sparing mastectomy more often as the method that is radical, with less complications and offer a quick return to active life.
optimal surgical procedure, our patients choose skin
esthetic outcome. In contrast to published data where nipple sparing mastectomy is seen to be an
surgery rather than surveillance
tissue expanders. We found that as the patient is well informed she tends to choose the risk
mutation carriers. We performed nipple
in our patients. During the years 2014
surveillance or risk
mutation carriers. The BRCA mutation carriers in our country can consider two options to reduce risk:
need to improve management strategy in reducing the risk
for breast cancer. With increasing number of women tested for BRCA mutation there is also increasing
recent years, there has been growing interest in identifying women with hereditary predisposition.
I
Treskova
Department of Gynaecology
Department of Genetics
Department of Surgery
Department of Plastic Surgery
Individual surgical approach in management of BRCA mu
teroncosurgery and microsurgery.

Abstract:

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Treskova, Inka

Biography:

Research Scientist-Professor level, Proteomics Research Unit, Biomedical Research Foundation of the Academy of Athens, Greece. Prof. George Th. Tsangaris was born in Chios, Greece. He holds a degree in Chemistry at 1983 from the Department of Chemistry, University of Ioannina (Ioannina, Greece) and a PhD in Biochemistry from the same University at 1991. From 1991 to 1993 he was post-doctoral fellow of French Government at INSERM U200 (Paris, France) with research interests in Molecular Biology, Molecular Immunology and Immuno toxicology. Dr. Tsangaris stayed in the same Unit of INSERM as researcher up to 1994. From 1994, he returned to Greece and joined the University Research Institute of Genetic and Malignant Diseases (University of Athens, Greece) as principal investigator, responsible for the project “Molecular Study of Childhood cancer”. In parallel as research fellow he joined the Hematology Unit, First Department of Pediatrics, School of Medicine, University of Athens (Athens, Greece). In 2002, he joined the Roche Centre for Medical Genomics (Hoffman-La Roche LTD, Basel, Swiss) for sabbatical studies in proteomics. From 2003 he joined the Proteomics Research Unit of the Biomedical Research Foundation of the Academy of Athens as a Professor Level Research Scientist. Dr. Tsangaris recent work is contributed to the extensive application of proteomics: a) For the study of human reproduction and specially the identification of biomarkers for the non-invasive prenatal diagnosis of embryonic and pregnancy complications, b) Neuroproteomics with special interest the analysis of normal brain function in animal models (mouse and rat), the brain asymmetry and laterization, and brain tumors with special interest the childhood brain tumors (astrocytoma, medulloblastoma etc.), c) At the development of proteomic-related methodologies including novel approaches for the protein identification with LC-MS/MS, the isolation and identification of naturally-occurring peptides and small proteins in biological materials, d) Food and Nutrition Proteomics with special interest the analysis of origin and the characterization of the food, the analysis of dairy products and the study of pediatric nutrient related diseases, e) The Uniqome: including the development of the bioinformatics approach, the database construction and the biological significance of the unique peptides within the proteome. From his research has published: 120 Peer-reviewed research papers, 30 review articles in International and Greek journals, 4 research papers in Greek journals, 4 book chapters, 26 presentations as invited speaker in International and Greek Congresses, 120 abstracts in International congresses and 65 abstracts in Greek Congresses. Dr. Tsangaris is owner of 11 Greek and 3 European patents. In 2016 he was awarded as Researcher-Entrepreneur of the Year, StartUp Greece Awards (established by EU and the Greek Ministry of Development). In 2014 he has founded PROTEOMARKERS BIOTECH P.C., a biotechnology oriented startup company, by which In 2016 he won the First award of the StartUp Greece Awards in Biotechnology for its business plan, in 2015 he won the Second award of the SFEE Innovation Project 2, and in 2015 he won the First Award of Hellenic Federation of Enterprises (SEV). He is founded member and president of the Hellenic Proteomics Society, founded member and local representative of the European Preventive, Predictive and Personalized Medicine Association. From 2013-2016 he was member of the Advisory Board of Human Proteome Organisation (HUPO) and from 2016 member at Large of Food and Nutrition Initiative (FaN), founded by HUPO. From 1998 he is member of the Scientific Advisory Board of the International Institute of Anticancer Research, editor of the journal Cancer Genomics and Proteomics and of the Journal of Biomarkers and member of the editorial board of three other international Journals.
Title:
High resolution mass spectrometry in preventive, predictive and personalised medicine.

Authors:
Tsangaris, G. Th.
Proteomics Research Unit, Biomedical Research Foundation of the Academy of Athens, Athens, Greece

Abstract:
Proteomics technologies are primarily aimed at the characterization and quantification of the total proteins contained in a biological sample. On the other hand, mass spectrometry (MS) measures the mass-to-charge ratio of ions to identify and quantify molecules in simple and complex mixtures. MS has become invaluable across a broad range of fields and applications, including proteomics. Within the last decade, the development of proteomics workflows combined with high-resolution, high-throughput and quantitative MS has expanded the scope of what we know about protein structure, function, modification and global protein dynamics. This presentation will focus on the applications of high-resolution mass spectrometry in different fields of preventive, predictive and personalised medicine such as embryonic chromosomal abnormalities, pregnancy complications, cancer, including paediatric brain tumours, leukaemia etc. Finally, the combination of high-resolution mass spectrometry, next generation sequencing and bioinformatics will be discussed.
Title: High resolution mass spectrometry in preventive, predictive and personalised medicine.

Authors: Tsangaris, G. Th.
Proteomics Research Unit, Biomedical Research Foundation of the Academy of Athens, Athens, Greece

Abstract: Proteomics technologies are primarily aimed at the characterization and quantification of the total proteins contained in a biological sample. On the other hand, mass spectrometry (MS) measures the mass-to-charge ratio of ions to identify and quantify molecules in simple and complex mixtures. MS has become invaluable across a broad range of fields and applications, including proteomics. Within the last decade, the development of proteomics workflows combined with high-resolution, high-throughput and quantitative MS has expanded the scope of what we know about protein structure, function, modification and global protein dynamics. This presentation will focus on the applications of high-resolution mass spectrometry in different fields of preventive, predictive and personalised medicine such as embryonic chromosomal abnormalities, pregnancy complications, cancer, including paediatric brain tumours, leukaemia etc.

The author of more than 20 articles in medical journals, with more than 30 citations, Hirsch index – 4.

Title: Frequency of polymorphic markers CYP2C19*2 and CYP2C19*3 in population of Russians in Stavropol Krai

Authors: Tsarukyan, A. A.1, Baturin, V. A.1,2
1Department of Clinical Pharmacology, Stavropol State Medical University, Stavropol, Russia
2Center of Clinical Pharmacology and Pharmacotherapy, Stavropol, Russia

Abstract: Allelic variants CYP2C19*2 and CYP2C19*3 may serve as the markers of an increased risk of adverse side effects or inefficiency when using substrates of CYP2C19 (clopidogrel, proton pump inhibitors, antidepressants, anticonvulsants).

In order to study frequencies of “slow” allelic variants CYP2C19*2 and CYP2C19*3 of the CYP2C19 gene, we examined 50 healthy volunteers – natives of the Stavropol Krai (ethnic Russians). Allelic variants of the gene were identified by real-time polymerase chain reaction. The material for DNA extraction was venous blood. The obtained data were analyzed using the statistical software package SPSS 16.0 for Windows. The assessment of the reliability of variations in allele frequencies between the studied groups was carried out according to the Kruskal-Wallis criterion H (the results were considered statistically significant if p<0.05). Genotyping showed that the frequency of carrying one mutant allele CYP2C19*2 or CYP2C19*3 among healthy volunteers was 17% and 4%, respectively. 29 subjects had the genotype CYP2C19*1/*1 (58%), 17 people – CYP2C19*1/*2 (34%), 4 people – CYP2C19*1/*3 (8%). Homozygous genotypes for functionally defective alleles were not detected. The total frequency of “slow” CYP2C19 metabolizers was 42%. Previous studies have shown that the CYP2C19*2 allele is widespread in Asian populations with a frequency of up to 30.0%, in Europeans up to 15.0-17.0% (Mcgraw J, Rehman KU, Scordo MG). The frequency of CYP2C19*2 in our study was close to that in studies of European and Russian populations (Gaikovitch, Sychev DA). We detected the CYP2C19*3 allele with a frequency of 4%, which exceeds the data of previous studies in the Russian population (less than 1%). Detection of the CYP2C19 genotype will allow to use it as a biomarker in order to personalize therapy with drugs-substrates of the enzyme under study.
Title:

Predictive, preventive and personalized medicine in plastic surgery

Authors:

Tsygankova, V.¹, Sokolovskiy, A.², Tsygankova, N.³, Golubnitschaja, O.⁴,⁵,⁶

¹Medical University of Vienna, Vienna, Austria
²Goethe University Frankfurt, Frankfurt am Main, Germany
³ASTRO, Clinic of aesthetic plastic surgery, Obninsk, Russian Federation
⁴Radiological clinic, Rheinische Friedrich-Wilhelms-Universität Bonn, Bonn, Germany
⁵Breast Cancer Research Centre, Rheinische Friedrich-Wilhelms-Universität Bonn, Bonn, Germany
⁶Centre for Integrated Oncology, Cologne-Bonn, Rheinische Friedrich-Wilhelms-Universität Bonn, Bonn, Germany

Abstract:

Plastic surgery is a surgical area which can be divided into two categories: reconstructive and aesthetic surgery. While reconstructive surgery aims to reconstruct a damaged (post-traumatic, cancer-removal) body site or to improve its functioning, the main purpose of the aesthetic surgery is improving the appearance. As an elective surgery cosmetic surgery has highly specific risk/benefit ratio.

The predictive and prognostic approach tailored to the individualised patient profile is highly desirable in the area, in order to develop perioperative stratification tolls, predict postoperative complications and calculate final treatment costs.

Evidence based approach is essential to provide optimal care in plastic surgery and protect interests of all key players in healthcare system (the treating plastic surgeon, the patient him/herself and insurance).

The aim of this study is to identify which kind of parameters are to be considered for individualised patient profiling, evidence based patient stratification and consequently true-personalised treatment algorithms.

For example, dealing with rejuvenation treatment, the predictive/prognostic approach by multi-level diagnostics might need to include:

- family history (non-modifiable factor of genetic predisposition e.g. to accelerated ageing)
- biologic vs. chronologic age
• anthropometric parameters
• tissue composition (fat/water/mussels)
• sub/cellular biomarker-panels providing information for healing quality (scar formation etc.), post-treatment sustainability of the modification and potential complications including chronic non-healing wounds, amongst others [1-4].

Consequent preventive measures may include individualised patient consultation, dietary and lifestyle aspects, adaptive modifications to the treatment approach and/or overall disease management.

References


Title:

Individualized treatment of osteoporosis in patients with impaired kidney function

Authors:

Vachek, J.\textsuperscript{1,2}, Marikova, A.\textsuperscript{1}, Pikner, R.\textsuperscript{3,4}

\textsuperscript{1}Dept of Internal Medicine and Dialysis Unit, Klatovy Hospital
\textsuperscript{2}Dept of Nephrology, Charles University and General Teaching Hospital, Prague
\textsuperscript{3}Dept of Bone Metabolism, Klatovy Hospital
\textsuperscript{4}Institute of Biochemistry, Charles University and University Hospital, Pilsen

Abstract:

Chronic kidney disease-mineral and bone disorder (CKD MBD) affects almost all patients with moderately to severely decreased glomerular filtration rate (GFR). A considerable number of those patients is affected also by osteoporosis. High coprevalence of CKD and osteoporosis requires interdisciplinar approach in those patients, taking into account further markers and comorbidities such as abnormalities of calcium, phosphorus, parathyroid hormone (PTH), vitamin D metabolism, presence of tissue calcifications or acid base balance. Recently, prospective studies have shown that measurement of bone mineral can predict and thus allow nephrologists to identify patients with high risk for skeletal fragility and targeted antifracture strategies for the first time. Newer investigations on the field of antiosteoporotic treatment in patients with CKD are discussed and a brief review of novel agents and possible problems associated with their use in CKD is provided.
Vodička, Josef, M.D., Ph.D., Associate Professor

Biography:
After he graduated from Charles University, Faculty of Medicine in Pilsen in 1993, he started working at the Department of Surgery at the Faculty Hospital Pilsen, where he currently holds the position of Deputy Chief for Education and Science. He gradually obtained assessments in surgery, thoracic surgery and surgical oncology and he successfully became an associate professor in 2009. His main specialization is thoracic surgery. He is a member of variety of scientific societies, academic and national institutions, including chairmanship of Accreditation Commission of Ministry of Health of the Czech Republic for Surgery. He is author or co-author of 84 articles with 76 citations in available literature, 8 monographs and 157 lectures, H-index 4. In year 1993 he was awarded Prize of Josef Hlávka and in 2015 he was awarded Maydl Prize of the Czech Surgical Society for the best monograph in surgery.

Title:
Long-term outcomes and prognostic factors of surgical treatment for pulmonary metastases from colorectal carcinoma: a single center experience.

Authors:
Vodička, J.1, Fichtl, J.1, Třeška, V.1, Skála, M.1, Šebek, J.1, Procházková, K.1, Mukenšnabl, P.2, Krákorová, G.3, Topolčan, O.4

1Department of Surgery
2Department of Pathology
3Department of Pneumology and Phtisiology
4Department of Immunochemistry Diagnostics

Charles University, Faculty of Medicine in Plzeň, Faculty Hospital Plzeň, Czech Republic

Abstract:
Introduction:
The aim of this study is an analysis of a cohort of patients operated for pulmonary metastases from colorectal carcinoma over a period of 18 years.

Methods:
The cohort comprised of 104 patients who were observed to determine whether there is a relationship between overall survival or disease free survival and the preoperative levels of selected biomarkers, the location of the primary tumor, the number of the metastases, the condition of the intrathoracic lymphatic nodes, etc. Median observation period was 63 months.

Results:
The 5-year survival rate among the cohort was 54.3%. Those who have 2 or more metastases have a 2.0 times higher risk of disease progression and a 2.1 times higher risk of death. If the intrathoracic lymph nodes are affected, the risk of disease progression increases 2.6 times and the risk of death increases by 4.3 times. Levels of CA 19-9 above the cut-off value of 28 IU/l increase the risk of progression of the disease by 2.4 times and the risk of death by 2.7 times. Levels of TPS above the cut-off value of 90 IU/l increase the risk of disease progression by 2.2 times and the risk of death by 3.9 times. Levels of CEA above the cut-off value of 3 µg/l increase the risk of death by 2.4 times.

Conclusions:
The prognostic factors that determine overall survival as well as disease free survival are the number of metastases, the condition of the intrathoracic lymphatic nodes and the preoperative levels of biomarkers.
Vohánka, Jaroslav, Ing., Ph.D., MBA

Biography:
Biography: Jaroslav Vohanka graduated in 2004 at Biochemistry and Biotechnology, Institute of Chemical Technology Prague, Faculty of Food and Biochemical Technology. He received Ph.D. in 2011 at First Faculty of Medicine, Charles University in Prague Institute, Biology and pathology of the cell, Biomedicine – Molecular Biology. Since 2007 he works for Roche. From 2013 till 2018 he led marketing team and nowadays his responsibility is development and establishment of a new digital business area and brand Navify.

Title:
DECISION SUPPORT TOOLS for clinicians in complex environments.

Authors:
Vohánka, J.
Diagnostics Division
ROCHE s.r.o.

Abstract:
The complexity of oncology means that every individual therapeutic decision is highly dependent on data from various sources, be it the electronic medical record, the picture archiving system, the pathology or laboratory system, “omics”-platforms of all kinds or various international research databases. For clinicians, this complexity is becoming increasingly difficult to handle and utilize data in order to make the right therapeutic decision at the right moment.

As a company that has the combined strengths of pharmaceuticals and diagnostics under one roof, with considerable knowledge in the field of oncology, Roche has expanded into the field of digital decision support with strategic goal to combine all this knowledge that we have to provide tailored decision support tools to the benefit of our customers and patients.
Windrichová, Jindra, Ph.D.

Biography:
Jindra Windrichová graduated from Charles University, Faculty of Pharmacy in Hradec Kralove in 2005– master degree in Medical bioanalysis with the dissertation on the topic “HPLC and Mass Spectrometry of Lipids”. and took a Ph.D. degree in 2009 at Charles University, Faculty of Medicine in Pilsen with the doctoral thesis: “Multiplex xMAP Immunoanalysis and Examples of Its Application”.

Professional experience as a bioanalytic in Department of Immunochemistry Diagnostics, Faculty Hospital in Pilsen and assistant professor in Central isotopic laboratory, Medical Faculty in Pilsen of Charles University. Teaching experience: lector of immunoanalytic applications in ESF founded educative programs and guaranty and teacher of analytical chemistry for Laboratory technicians at the University of West Bohemia, Faculty of Healthcare studies. She participates in research of circulating biomarkers with focus on multiplex immunoanalysis and molecular biology. She is an author or coauthor of more than 50 articles, H-index 12.

Title:
Strategies to identify optimal biomarker candidate for PPM – new classes of biomarkers

Authors:
Windrichova, J.1, Topolcan, O.1, Rezackova, H.1, Fuchsova, R.1, Kucera, R.1, Pesta, M.2

1Department of Immunochemistry Diagnostics, Faculty Hospital in Pilsen
2Department of Biology, Faculty of Medicine in Pilsen, Charles University, Czech Republic

Abstract:
Biomarker applicability depends mostly on proper process of transition of biomarker from primary research to proper clinical evaluation. Our aim is an ideal biomarker- specific for disease type, absent in non-disease, concentration correlated to the clinical stage and sensitivity even for first stages to be able to treat all patients and much more to be able to screen for the disease. For last decades, we can see innovative approaches in primary research and growing understanding in the molecular mechanism of diseases, new analytical approaches but we meet stagnant rate of biomarker approval for clinical use. This is called biomarker pipeline gap, which is caused by barriers – proper candidate prioritization, choice of analytical tools and technological variability within/across platforms, improper biospecimen collection or storage and improper experimental design involving clinical samples in biomarker studies and insufficient data management -comparison of large datasets and multi-dimensional data. Crucial is the incapability of wisdom credentialing biomarker candidates prior to costly and time-consuming clinical qualification studies. Now-a-days, there arise not only single candidate biomarkers or their combination but there arise the whole novel classes e.g.: protein-derived – phosphorylation states, cell surface receptors, DNA based (SNP, CNV, methylation), RNA based -snoRNA, microRNA, ncRNA, IncRNA, piwiRNA. In biomarker candidate sorting we often use so called “educated guesses” after “manual” review of literature. But for systematic selection the novel approaches should be used – growing number of databases and genome-wide research projects e.g. The Cancer Genome Atlas and computational review approaches using natural language processing for identifying articles.
Yang, Baofeng, Professor

Biography:
Prof. Baofeng Yang, Academician of Chinese Academy of Engineering, fellow of Royal Society of Biology, Honorary Professor of world famous universities in the US, Russia, Australia and Japan. Professor Yang is Director of state key pharmacology discipline, Vicepresident of Chinese Medical Association, Honorary Chairman of Chinese Cardiovascular Pharmacologic Society, Scientific committee member of China's Education Ministry. Prof. Baofeng Yang has published over 400 SCI-indexed papers in prestigious academic journals. The published papers have been cited over 10000 times. Prof. Baofeng Yang was the editor-in-chief of the medical textbook——Pharmacology (Sixth, Seventh, Eighth, and Ninth Edition). In the past years, Prof. Baofeng Yang was awarded some prizes, which includes: The Second Prize of the State Natural Science Award of Science and Technology Progress in 2004.

Title:
The Role of Non-coding RNAs in Malignant Cardiac Diseases

Author:
Yang, B.

Department of Pharmacology (State-Province Key Laboratories of Biomedicine-Pharmaceutics of China, Key Laboratory of Cardiovascular Research, Ministry of Education), College of Pharmacy, Harbin Medical University, Harbin, Heilongjiang 150081, P. R. China

Abstract:
Cardiovascular diseases has become the most serious health threat and represents the majoy cause of morbidity and mortality in China, as in industrialized nations. Since the past decades, China’s economic boom has tremendously improved people’s living standard, but also changed people’s life style boosting the prevalence of cardiovascular disease, so called “disease of modern civilization”. This new trend has attracted the main force of research. Many of the studies conducted by Chinese investigators are orientated to understanding the molecular mechanisms of cardiovascular disease. At the molecular level, the long-standing consensus is that cardiovascular disease is associated with sequence mutation (genetic anomaly) and expression deregulation (epigenetic disorder) of non-protein-coding genes. However, new research data have established the non-coding RNAs (ncRNA, including microRNAs, lncRNAs, etc.) as a central regulators of pathogenesis of cardiac disease and potential new therapeutic targets for cardiovascular disease. Over the years, a large body of studies on ncRNAs in cardiovascular disease has been conducted by investigators from our lab, yielding fruitful research and better understanding of ncRNAs as a new layer of molecular mechanisms for the pathogenesis of cardiac disease. In this review, we will give a brief summary of our current status of research in the field of ncRNAs in various cardiac conditions including cardiac arrhythmia, myocardial ischemia, cardiac hypertrophy and heart failure, and in exploring the potential of ncRNAs as novel diagnostic biomarkers and therapeutic targets.
Zarandiya, Nino

Biography:
4th year medical student of Astrakhan State Medical University. From the beginning of the 2nd year, I have been an active participant in the scientific organisation of young scientists and students of the university in the field of "Proteins markers and molecular bases of pathological processes". I participated in 2 scientific conferences and published 3 reports.
Email: Nina.zarandiya@mail.ru

Title:
N-terminal pro-brain natriuretic peptide as a predictor of complications in CARDiosurgical PATIENTS

Authors:
Zarandiya, N. R.1, Petrova, O. V.1,2, Nikulina, D. M.1, Shashin, S. A.1, Tarasov, D. G.1,2
1Astrakhan State Medical University, Astrakhan, Russia
2Federal center cardiovascular surgery, Astrakhan, Russia

Abstract:
N-terminal pro-brain natriuretic peptides (NT-proBNP) – the myocardium dysfunction marker.

NT-proBNP was studied in 7 women and 23 men with acquired heart disease, hospitalized for surgical treatment. Their NT-proBNP concentration ranged from 796.9 to 16327 pg/ml. The patients were divided into 3 groups depending on the postoperative period. In 24 patients with a favorable early postoperative period, the concentration of NT-proBNP was 843.60 ± 64.92 pg/ml. After being in the intensive care unit (26.43 ± 2.43 hours) without inotropic support, they were discharged for 14 (±1.5) days. In 5 patients, the early postoperative period was complicated by acute heart failure with an NT-proBNP concentration of 5328.6 ± 939.48 pg/ml. Their stay in the intensive care unit with inotropic support was 106.83 ± 13.58 hours and they were discharged on the 17th (± 2) day. One patient developed an acute heart failure in the early postoperative period. Despite the active inotropic support, he died on the 6th day. The concentration of NT-proBNP is 16327 pg/ml.

Correlation analysis revealed the relationship between NT-proBNP and clinical condition of patients. Its concentration correlates with the frequency and the degree of cardiac complications up to decompensation of heart failure. Thus, NT-proBNP may be a predictor of postoperative complications in cardiosurgery patients. Its concentration must be determined at the prehospital stage for patient rehabilitation with high NT-proBNP values for surgery in order to reduce the incidence of complications.
Zhan, Xianquan, M.D., Ph.D., Professor

Biography:
Xianquan Zhan received his M.D. and Ph.D. training in preventive medicine at West China University of Medical Sciences during 1989-1999. He received his post-doctoral training in oncology and cancer proteomics at Central South University and University of Tennessee Health Science Center (UTHSC). He worked at UTHSC and Cleveland Clinic in USA during 2001-2012, and achieved the rank of Associate Professor at UTHSC. In 2012, he moved to Central South University as a Professor, and Advisors of MS/PhD graduate students and postdoctoral fellows. He is also the Fellow of Royal Society of Medicine, Fellow of EPMA, European EPMA National Representative, AAAS member, Editor-In-Chief of IJCDT, Associate Editors of EPMA Journal and BMC Genomics, and Guest Editors of Frontiers in Endocrinology and Mass Spectrometry Reviews. He has published 126 articles, 15 book chapters, and 2 US patents in the field of clinical proteomics and biomarkers, with more than 1750 citations, H-index 23.
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Title:
Energy metabolism heterogeneity-based molecular pattern biomarker in ovarian cancer

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Abstract:
Energy metabolism heterogeneity is a hallmark in ovarian cancer, namely the Warburg effect and the reverse Warburg effects coexist in ovarian cancer. Exploration of energy metabolism heterogeneity benefits for discovery of the effective biomarkers for ovarian cancers. Comprehensive analysis of mitochondrial proteomics data (1198 mitochondrial differentially expressed proteins), proteomics data (205 differentially expressed proteins), and transcriptomics data (20115 genes in 419 ovarian cancer samples) revealed (i) the upregulations of rate-limiting enzymes PKM2 in glycolysis, IDH2 in Kreb’s cycle, and UQCRH in oxidative phosphorylation (OXPHOS) pathways, (ii) the upregulation of PDHB that converts pyruvate from glycolysis into acetyl-CoA in Kreb’s cycle, and UQCRH in oxidative phosphorylation (OXPHOS) pathways, (iii) the binding sites between miRNA (hsa-miR-186-5p) and RNA-binding protein (EIF4AIII) in those key proteins in energy metabolism pathways. Furthermore, IncRNA SNHG3 interacted with miRNA (hsa-miR-186-5p) and RNA-binding protein (EIF4AIII). The anti-parasite drug ivermectin regulated the rate-limiting enzymes and other proteins in glycolysis, Kreb’s cycle, and OXPHOS pathways, and inhibited cell proliferation and promoted apoptosis of ovarian cancer. Those results were further confirmed in the ovarian cancer cell models and tissues. It clearly concluded that IncRNA SNHG3 regulated energy metabolism through miRNA (hsa-miR-186-5p) and RNA-binding protein (EIF4AIII) to regulate the key proteins in the energy metabolism pathways. SNHG3 inhibitor might interfere with the energy metabolism to treat ovarian cancers. Ivermectin might have new potential for ovarian cancer treatment through regulating energy metabolism pathways. These findings provide more accurate understanding of molecular mechanisms of ovarian cancers and discovery of effective energy-metabolism-heterogeneity-based therapeutic drugs for ovarian cancers.