Institute of Molecular Biomedicine, Faculty of Medicine, Comenius University, Bratislava

INSTITUTE OF MOLECULAR BIOMEDICINE

2015


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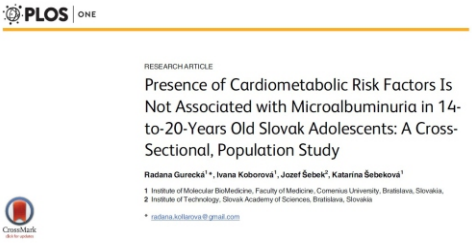
Scientometric data, year 2015

2015
number of CC/IF publications - 36
of these with first/last authors from IMBM - 22
cumulative IF - 103,94



PLOS ONE

RESEARCH ARTICLE

Presence of Cardiometabolic Risk Factors Is Not Associated with Microalbuminuria in 14-to-20-Years Old Slovak Adolescents: A Cross-Sectional, Population Study

Radana Gurecka[1]*, Ivana Koborova[1], Jozef Šebek[2], Katarína Šebeková[1]

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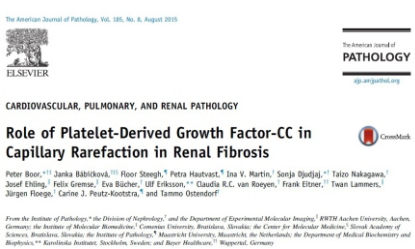

The American Journal of Pathology, Vol. 185, No. 8, August 2015

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The American Journal of PATHOLOGY

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CARDIOVASCULAR, PULMONARY, AND RENAL PATHOLOGY

Role of Platelet-Derived Growth Factor-CC in Capillary Rarefaction in Renal Fibrosis

Peter Boor,*†‡ Janka Babickova,§‖ Floor Steegh,¶ Petra Hautvast,¶ Ina V. Martin,† Sonja Djudjaj,*† Taizo Nakagawa,† Josef Ehling,† Felix Gremse,† Eva Bücher,† Ulf Eriksson,** Claudia R.C. van Roeyen,† Frank Eitner,† Twan Lammers,† Jürgen Floege,† Carine J. Peutz-Kootstra,¶ and Tammo Ostendorf†

From the Institute of Pathology,* the Division of Nephrology,† and the Department of Experimental Molecular Imaging,‡ RWTH Aachen University, Aachen, Germany; the Institute of Molecular Biomedicine,§ Comenius University, Bratislava, Slovakia; the Center for Molecular Medicine,‖ Slovak Academy of Sciences, Bratislava, Slovakia; the Institute of Pathology,¶ Maastricht University, Maastricht, the Netherlands; the Department of Medical Biochemistry and Biophysics,** Karolinska Institutet, Stockholm, Sweden; and Bayer Healthcare,†† Wuppertal, Germany

Neurosci Bull March, 2015. http://www.neurosci.cn
DOI: 10.1007/s12264-014-1510-8 1

Original Article

Effects of testosterone and estradiol on anxiety and depressive-like behavior *via* a non-genomic pathway

Barbora Filova[1], Maria Malinova[1], Janka Babickova[1,5], Lubomira Tothova[1,5], Daniela Ostatnikova[2], Peter Celec[1,3,4,5], Julius Hodosy[1,2,5]

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frontiers in Cellular and Infection Microbiology

REVIEW

Salivary markers of oxidative stress in oral diseases

L'ubomíra Tóthová[1,2], Natália Kamodyová[1], Tomáš Červenka[1] and Peter Celec[1,3,4]*

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The Renal Effects of Prenatal Testosterone in Rats

Janka Bábíčková, Veronika Borbélyová, L'ubomíra Tóthová, Katarína Kubišová, Pavol Janega, Július Hodosy and Peter Celec*

From the Institutes of Molecular Biomedicine (JB, VB, LT, JH, PC), Pathology (KK, PJ) and Pathophysiology (PC), Faculty of Medicine, Department of Molecular Biology, Faculty of Natural Sciences (PC) and Institute of Physiology (JH), Comenius University and Center for Molecular Medicine, Slovak Academy of Sciences (JB, LT, JH, PC), Bratislava, Slovakia

Researchers at IMBM

Associate Professors:

Assoc. Prof. **Peter Boor**, MD., PhD.
CC/IF publications - 82, SCI citations - 1375, h-index - 20
renal fibrosis, nephropathology, immunopathomechanisms, models of renal diseases, imaging
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Assoc. Prof. **Peter Celec**, MD., Ing., MSc., DrSc., MPH.
CC/IF publications - 179, SCI citations - 1161, h-index - 17
testosterone, salivary markers, horizontal gene transfer, biostatistics, extracellular DNA
petercelec@gmail.com

Assoc. Prof. **Katarína Šebeková**, MD., DrSc.
CC/IF publications - 141, SCI citations - 1649, h-index - 24
metabolic syndrome, diabetes mellitus, advanced glycation end products, clinical biochemistry, pathogenesis of renal diseases
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Postdocs

Janka Bábíčková, MSc., PhD.
CC/IF publications - 12, SCI citations - 19,
h-index - 3
phage display, sex steroids, inflammatory bowel disease,extracellular DNA,
experimental nephrology
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Roman Gardlík, MD., MSc., PhD.
CC/IF publications - 32, SCI citations - 341,
h-index - 12
gene therapy, inflammatory bowel disease,
bacterial vectors, cell cultures, pluripotency
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Július Hodosy, MD., MSc., PhD., MPH.
CC/IF publications - 59, SCI citations - 346,
h-index - 11
behavioral analysis, sex steroids, oxidative stress,
animal models of diseases, sleep apnea syndrome
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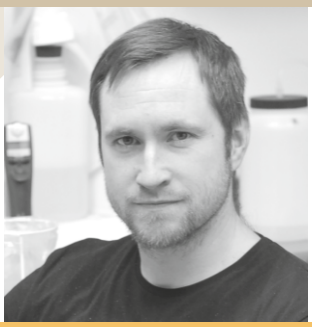

Gabriel Minárik, MSc., PhD.
CC/IF publications - 51, SCI citations - 221,
h-index - 8
molecular genetics, next-generation sequencing,
prenatal diagnostics, non-syndrome deafness,
forensic genetics
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Ľubomíra Tóthová, MSc., PhD.
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urinary tract infections, salivary markers, oxidative stress, bacteriophages, microbiology
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Barbora Izrael Vlková, MSc., PhD.
CC/IF publications - 23, SCI citations - 86, h-index - 6
extracellular DNA, non-invasive prenatal diagnostics, preeclampsia, quantitative real-time PCR, molecular pathology
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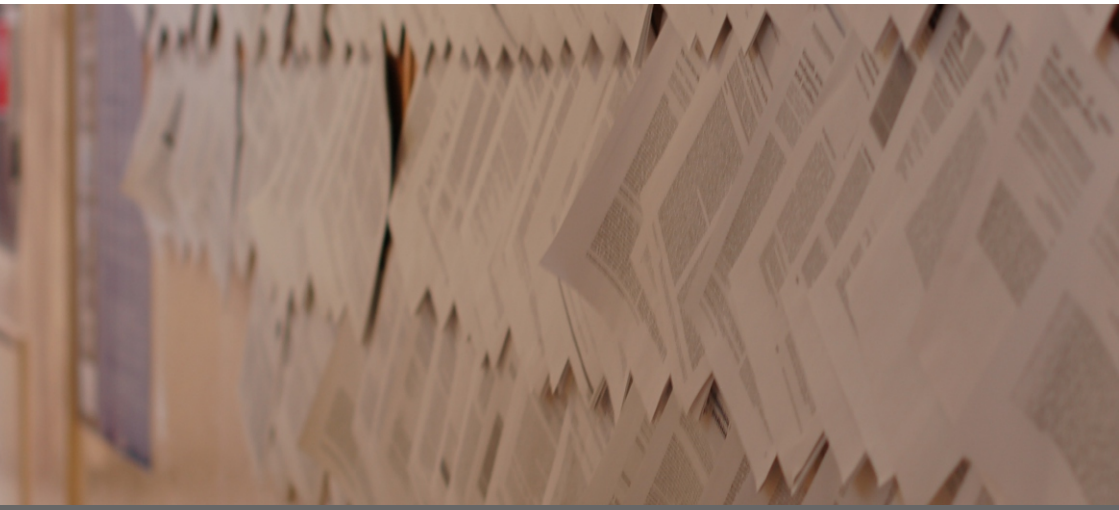


PhD students at IMBM in 2015

MSc. Veronika Borbélyová, MSc. Tereza Brachtlová, MSc. Jozef Čonka, MSc. Emese Domonkos, MSc. Radana Gurecká, MSc. Marianna Gyurászová, MSc. Jana Hlinková, MSc. Katarína Janšáková, MSc. Ivana Koborová, MSc. Barbora Konečná, MSc. Alexandra Kovalčíková, MSc. Lucia Lauková, MSc. Veronika Melišková, MSc. Melinda Csongová, MSc. Lenka Pálková, MSc. Gabriela Repiská, MSc. Tatiana Sedláčková, MSc. Helena Svobodová, MSc. Henrieta Vegešiová, Ing. Alexandra Wagnerová

PhD students who successfully defended their theses in 2015

MSc. Janka Bábíčková, PhD.; MSc. Gabriela Repiská, PhD.

Master students who studied at IMBM in 2015

Martin Bosý, Mária Kačmárová, Jordanka Homolová, Ľubica Janovičová, Róbert Lipták

Master students who successfully defended their theses in 2015

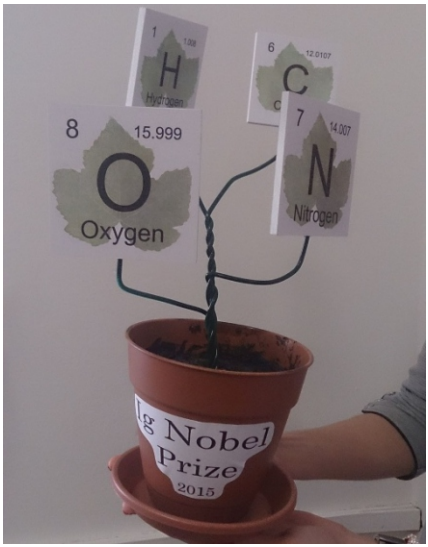
Lucia Bečáková, Jozef Čonka, Lenka Keresztesová, Denisa Kuffová, Patrik Lauček, Simona Lipková, Nina Paššáková, Erik Schwarz

Other employees

Lenka Libáková, Ingrid Simonová, Mária Turoňová

The year 2015 at IMBM - the view of the head of the institute

The year 2015 was at our institute one of the most challenging - as every year. Great achievements - especially abroad - alternated with disappointments - particularly at home in Slovakia. The success is publications in reputable journals, invited lectures at international conferences, but also our PhD students accepted in laboratories around the world. Of course, we were pleased about all received awards, especially the Ig Nobel Prize, which we have received at Harvard as the first team from Slovakia for the research in kissing as a source of contamination of female saliva by male DNA. Probably the most valuable thing about it was the opportunity to have a presentation at MIT on the background, causes and implications of the study.



On the other hand, we had our downs. Especially, when it comes to the assessments of our grant applications. We did not receive even one APVV grant and it looked similar with our application for VEGA grants. Therefore, it is already clear now that 2016 will be even more difficult. The majority of our grant projects are finished and now we will see whether we can work not only with small grants, but completely without any grants. Our situation confirms that the success in the national grant agencies is a very bad quality indicator. However, the output must be more important than the input - in science publications are more important than grants and more informative as a parameter for assessing the scientific quality. Perhaps this situation will help us at least to increase the efficiency of our research efforts. It is, however, not possible to work this way for a long time. Our publication success obliges us to influence and change the environment and conditions under which science is conducted in Slovakia, both, through the media and public appearances, as well as through the faculty senate and scientific board.

Not that there was not enough popularisation of science and discussions in 2015. We attended roundtables of the ministry of education, Night of Researchers, we regularly gave interviews in radio, television and print media.

During the science week, we even had a full day of lectures for the public at the CVTI institute. Although we are accused or envied by some of our colleagues, we all are paid from public funds and thus, part of our work is to explain to the public what we are actually paid for and what we do with the money from taxpayers. Many of us also know how senselessly these funds are spent in the context of structural EU funds or as a result of inefficiency of public tendering. Being quiet about these issues is an option, but then one cannot be surprised if the situation gets worse. Criteria for the scientific career, inflation of academic titles at all levels, senseless author contribution percentages, allocation of funds for science ignoring standard grant agencies but also dangerous popular myths - many issues that bother us and cannot be neglected. As every year, in 2015 we replaced our PhD students. Some successfully defended their theses, others did not meet our strict criteria, but they are all satisfied with their current positions and we have a good relationship with all of them. It is still true that a rejection is not a punishment. On the contrary, the punishment may be the persistence on an inappropriate positions.

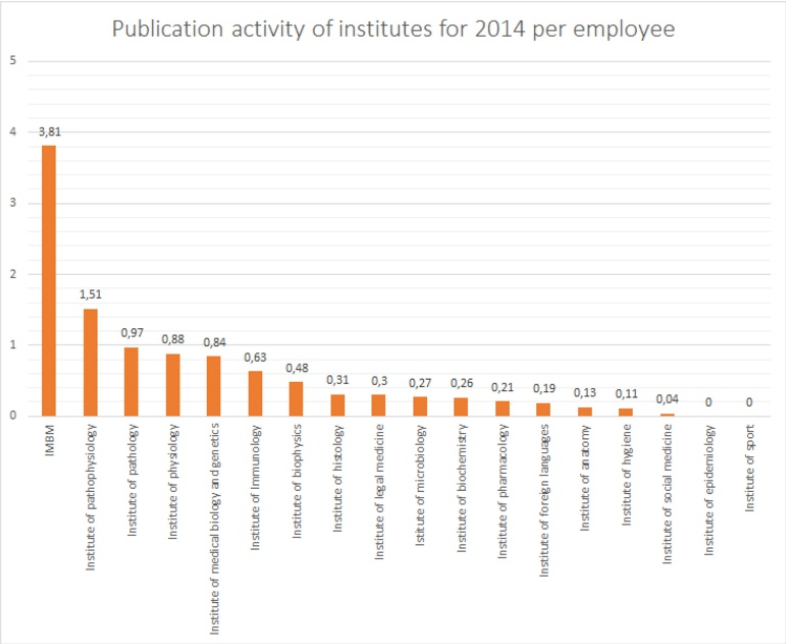
Jwe are happy that after graduation, our PhD students have found their positions at the Faculty of medicine. Unfortunately, in the past that did not work. In the future we want to form the next generation of scientists for the faculty by this way. This might contribute to the growth of other institutes. It should be considered whether such employees - postdocs should be accepted by clinical departments, in particular by those that have problems with the research productivity. Many of us, including new PhD students have attended international conferences. We have conducted several visits abroad to create new cooperations or to support existing collaborations.

But we have also learned how to make a world science by visiting the United States, Germany or Sweden. Visiting successful scientific institutes abroad opens eyes and lets one see how the difficult domestic problems can easily be solved. At the time when we virtually have no grants, collaboration to develop new products with Analytik Jena Innuscreen and the testing of new pharmacologically active substances with Pfizer is essential. During the summer in our laboratories we hosted again foreign students and students from Slovakia who are studying abroad. As confirmed several times in the past, such internships are beneficial for both sides. But it can be a misery for both sides if the students are not motivated to do real science. In the long term, we are mostly satisfied with internships of high school students who definitely do not lack motivation.

Our main task is to do science and that still means to publish in high-quality journals, if possible. For the year 2015 we again succeeded. Employees and PhD students at IMBM were authors and co-authors of unbelievable 36 publications in journals with IF, the total cumulative IF exceeded 100. Thus we have broken our own records. Already in the research report of the Faculty of medicine for 2014, we have been the most successful institute. Our institute was established to do science. We hope that our publications will help the faculty to move forward in the evaluation rankings. But that also depends on the denominator of efficiency endpoints and we cannot affect this.

The year 2015 was for IMBM a year of quantity, let 2016 be a year of quality!

Peter Celec



Source: Annual report Faculty of Medicine, CU, 2014

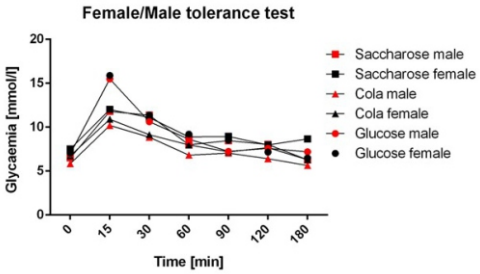
Metabolic consequences of cola beverages

In the past, we have found that long-term intake of cola beverages led paradoxically to an increase in insulin sensitivity. Independently, a research team in South Korea found similar results. Besides, long-term observations showed that cola intake can lead to weight reduction. It is probable that caffeine is an important component for this effect, as caffeine influences vigilance and might contribute also to higher locomotion. Other authors found that caffeine increases the expression of so called uncoupling proteins that short-circuit mitochondria, and therefore a large amount of energy obtained from saccharides is actually transformed to heat without ATP production and, thus, fat synthesis.

When we performed oral glucose or oral saccharose tolerance test and compared the glycemia dynamics with the dynamics after application of the relevant amount of coke beverages, we found that glycemia was lower in the coke group what could support the caffeine hypothesis. It is clear that adaptation of metabolism in a long-term administration will be more important for the interpretation and application. Apart from glucose metabolism, renal and gastrointestinal effects are important to us as well.

In cooperation with other institutions we showed that coke does not improve the symptoms of colitis which is in opposite to published papers describing protective effect of caffeine. The renal effects are yet to be investigated.

Even though we do not have any funding support for our cola experiments, we obtained important permission from State veterinary and food administration, so we can answer above mentioned questions on an experimental level. The potential gender differences as well as other factors influencing the interpretation of the results will be also examined. This topic has to be solved, especially when large association studies clearly show that cola beverages are linked with obesity, diabetes and metabolic syndrome.



Glycemia dynamics after administration of saccharose, glucose and coke in both genders.

Bacteria and inflammatory bowel disease

The researchers at IMBM have long been engaged in the research of inflammatory bowel disease (Crohn's disease, ulcerative colitis) and related pathologies (colon cancer). In the past, the IMBM staff successfully introduced chemically-induced colitis model using dextran sulfate sodium. The therapeutic modalities at IMBM include gene therapy and, in particular, bacterial systems for transfer of therapeutic molecules to target cells. While working on this we have acquired some other important results. One of our previous projects was focused on the monitoring of sex differences in the chemically induced colitis in mice. In our experiments we have shown protective effects of estradiol on various indicators of colitis.

We are currently further analyzing these results and trying to uncover the molecular mechanisms. Estradiol binds to estrogen receptors. There are two nuclear receptors known - estrogen receptors α and β, and a membrane estrogen receptor. Result of binding to these receptors is their activation and signal transduction. Each of the receptors have different biological functions and transmits different type of signal.

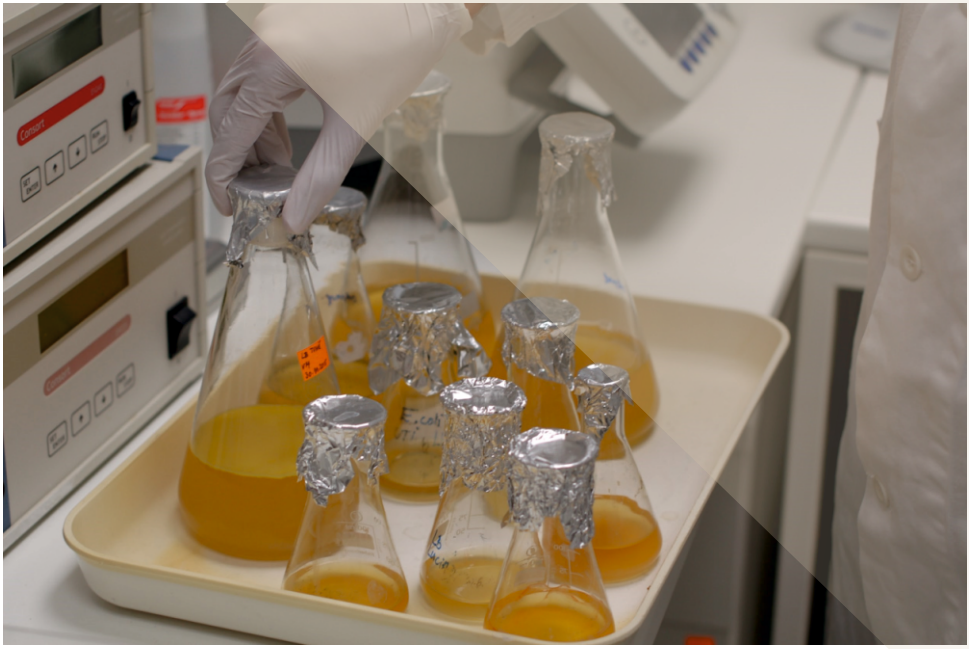
To clarify the biological function of the respective receptors in colitis we have in the past year focused on the therapeutic application of estrogen receptor β agonists and membrane estrogen receptor agonists. So far we have not found any therapeutic effects in the modulation of expression of any of these receptors, but there is one more receptor left - estrogen receptor α.

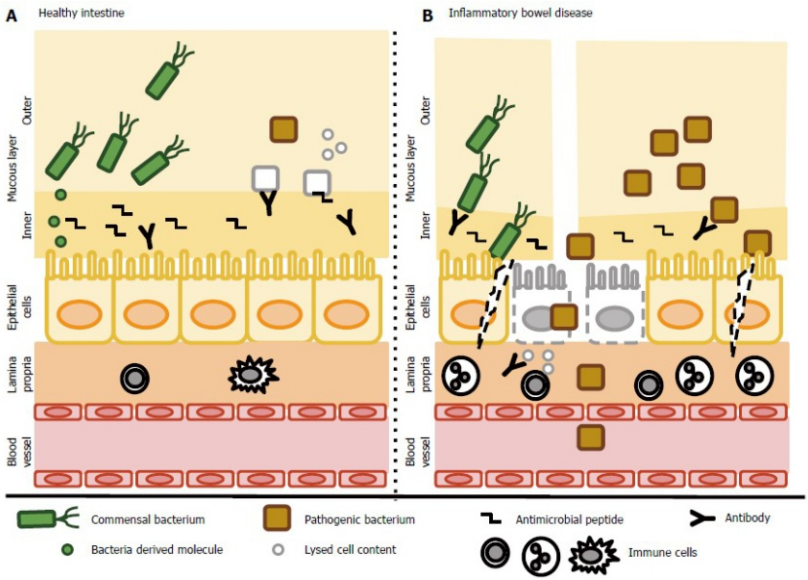
In the future, we plan to test compounds capable of affecting the estrogen receptor signaling in a different way. Besides that, the growth and the survival of bacterial vectors were analyzed in gastrointestinal fluids and homogenates of various parts of the gastrointestinal tract in vitro. Given the crucial role of the gut microbiota in the pathogenesis of inflammatory bowel disease, the present research aims to clarify this phenomenon by means of fecal microbiota transplantation. It was found that the composition of the microbiota is crucial to the severity of the disease. Susceptibility to the disease and its severity depend on the characteristics of the microbiota donor; microbiota from colitis-resistant donor induced higher susceptibility to the disease in the recipient.

Our group standardized the protocol for UTI model through transurethral catheterization. However, ovariectomy did not prove to have any effect on severity or the course of the disease.

The role of testosterone as well as individual receptors of sex steroids in UTI pathogenesis is not clear. Recent studies showed that other steroids as is for example vitamin D could have modulatory effect on immune system. The lower levels of vitamin D were associated with higher incidence of recurrent infections.

Because of the complexity of steroid metabolism, the mechanism of action is still not recognized. We suppose that steroids can influence the expression of antimicrobial peptides, what in turn can increase the resistance of urothel on bacterial colonization or at least can trigger mild form of UTI in both genders. Nevertheless, this has to be proved in subsequent year.





Interaction between microbes and the host in healthy intestine and inflammatory bowel disease.

Urinary tract infections

Urinary tract infections (UTI) are the second most common bacterial infection occurring in humans. They are also a common cause of morbidity in females of all age groups and in older males. Specific type of UTI is its recurrent form. Pyelonephritis, chronic kidney disease and kidney failure are just some of the serious consequences of such recurrences. . The differences in frequencies as well as in the severity of the disease between males and females suggest that steroid hormones play a role in immune answer to uropathogenic bacteria.

Some of the available experimental studies showed that estrogen replacement therapy of postmenopausal females can decrease the risk of UTI, however, other studies showed the opposite.

The effects of testosterone on cognitive and renal functions

The critical period, during which testosterone is produced by the developing fetus is important not only for the development of the brain but also other organs. This year, we focused on the investigation of the effects of prenatally administered testosterone on the developing brain, namely its influence on the cognition and behavior of the offspring. Because the metabolism of testosterone is complicated and its effects are in fact mediated by a variety of its metabolites, e.g. estradiol or dihydrotestosterone, we have investigated one possible route of its action – the signaling via the androgen receptor. With regard to behavior, we have analyzed overall locomotor activity, anxiety, depression, spatial orientation, social interaction and cognition.

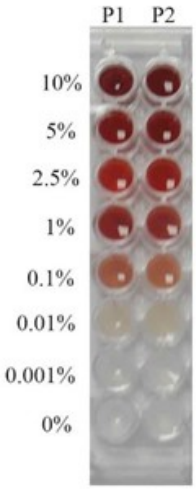
Because each individual undergoes postnatal development, including various vulnerable periods, we analyzed not only adults but also a prepubertal offspring. Despite the elevated concentrations of plasma testosterone in dams, there were no significant differences in this parameter in the offspring, nor in prepubertal period or in the adulthood. In the behavioral characteristics, no effects of testosterone were observed when compared to control groups, nor in females or in males. Although no statistically significant differences were found between the groups, prenatally administered testosterone might still influence some aspects of behavior and thus our investigation of this topic will take place also in the year 2016, with careful consideration of the variability and limitations from previous experiments.

Saliva as diagnostic fluid

Saliva represents a body fluid, which can be easily and repeatedly collected. It is an interesting alternative to blood sampling when diagnosing, monitoring or screening of various diseases. At the same time, the saliva consists of extremely heterogenous components. Therefore it is of utmost importance to correctly collect the saliva and to think about limitations and variability of individual markers. Last year we solved the problem of blood contamination in saliva. The blood can contaminate the saliva, what in turn leads to artificially increased biochemical markers. From our results, it is clear that to significantly influence some markers of oxidative stress (eg. AOPP) and antioxidative status (e.g. TAC) we need approximately 0.1% concentration of blood in saliva. This concentration is very well visible by eye, therefore our protocol excludes such samples. In all other samples, without visible blood contamination, it is not necessary to further evaluate the contamination by hemoglobin measurement, since this would not affect the measured markers.

After long term salivary research in use with oral diseases as are periodontitis, oral cancer or sleep apnea syndrome, we extended our salivary research also to other diseases in 2015.

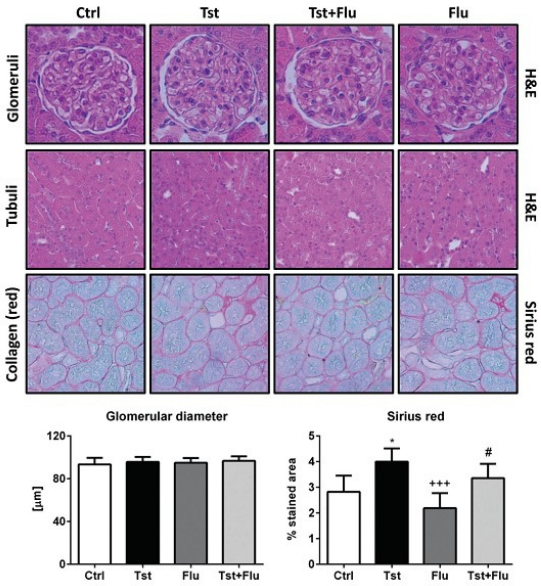
For example, we found that saliva can be potentially used in monitoring of the sclerosis multiplex course or to monitor the answer to the treatment. In this particular disease, the markers of oxidative stress were significantly higher in patients group when compared to the control group. In subsequent period, we will aim our saliva research in diagnostics of renal diseases.



Salivary samples from two volunteers, which were artificially contaminated by blood in concentration of 10%, 5%, 2.5%, 1%, 0.1%, 0.01%, 0.001% and 0%.

Although we have not reached any breakthrough results in the field of cognitive functions, we have found out what effects of prenatally administered testosterone might exert with regard to renal structure and function. The exposure to increased levels of testosterone in the intrauterine development was associated with higher renal excretion of proteins in the adulthood. In the case of blocking of the effects of testosterone using specific antagonist of androgen receptor – flutamide, such effects were not found.

From the structural point of view, prenatal exposure to testosterone was accompanied by a higher accumulation of collagen in the renal interstitium and, again, such effects were not found if the signaling was blocked using flutamide. Interestingly, these effects were found only in the male offspring, suggesting sexual dimorphism during prenatal development of the kidneys.

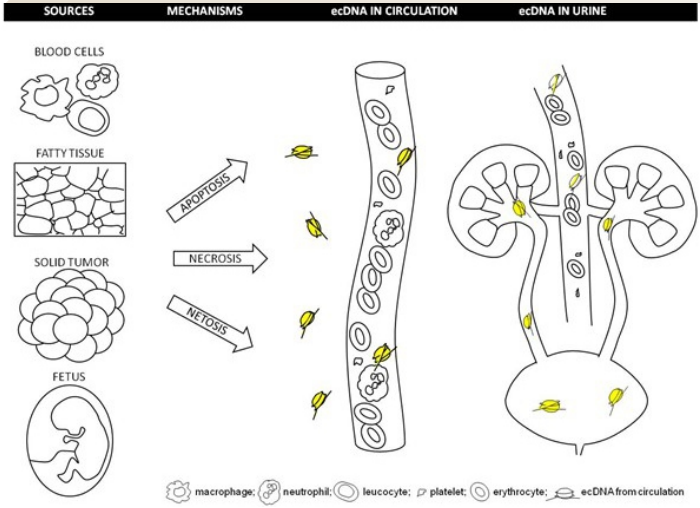


Histomorphometric analysis of kidneys after prenatal influence of testosterone.

Extracellular DNA

The DNA is typically located in the nucleus of cells, or in mitochondria, but sometimes can get out of the cells and is present in the blood circulation. The source of extracellular DNA are the disintegrated cells and this DNA can be isolated from a sample of plasma, urine or cerebrospinal fluid. In certain circumstances, physiologically and also pathophysiologically, the amount of extracellular DNA is changed. Extracellular nucleic acids are tested mostly as a possible biomarker for diagnosis. Less attention is paid to their potential impact on the organism and its role in the pathogenesis of diseases.

Toll-like receptors, as well as receptors for AGEs (advanced glycation end products) recognize extracellular nucleic acids and subsequently activate signaling pathways in various cells including immunocompetent ones. In in vitro experiments, we monitored the extracellular DNA. The source of it are the neutrophil extracellular traps that arise during netosis activated by pathogens and are obviously an important source of extracellular DNA in plasma. It is believed that the extracellular DNA is bound to the histones and in this form is protected from degradation by the action of plasma deoxyribonucleases.

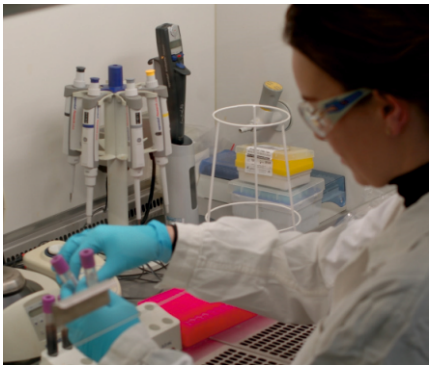


The origin of extracellular nucleic acids

Preeclampsia

Preeclampsia is a serious pathophysiological condition that affects pregnant women; the exact causes of the development are not yet known and there is no effective treatment available. During preeclampsia, ischemia of the placenta and hypertension occur, which leads to abnormal activation of the immune system of a mother and subsequently to inflammation. The impact of increased oxidative stress and inflammation are released microvesicles from the trophoblast having a pro-inflammatory, anti-angiogenic and procoagulant effects. Hypoxia of trophoblast cells results in the presence of increased amounts of fetal DNA in maternal circulation, which, according to our hypothesis, may contribute to the further deepening of the inflammatory response. In preeclampsia, toll-like receptors play an important role. These are activated by the binding of a variety of DNA and RNA molecules. The source of these molecules are pathogens and microorganisms which are recognized by the immune system and subsequently eliminated. Fetal DNA is partially similar to bacterial DNA and can activate toll-like receptors of the mother's immune system during preeclampsia. Fetal DNA is naturally present in the maternal circulation during pregnancy and may contribute to preeclampsia.

We have planned animal experiment in which we wanted to verify the role of circulating fetal DNA in preeclampsia. A number of published works mention that during preeclampsia there is more circulating fetal DNA present in maternal blood and that the DNA fragment size is different when compared to pregnancies with a normal course. Several kinds of DNA were applied, but it did not lead to preeclampsia-like symptoms in pregnant female animals. A substance, LPS (lipopolysaccharide), that strongly activates the immune system of the mother and evokes strong inflammation had a negative impact on the mother and the fetus. In the following months these experiments will be completed with DNA fragments with defined size in order to verify if different length sequence of fetal DNA causes differences in the immune response.



Conferences

In 2015, employees and PhD students from IMBM actively attended the following international conferences

91. Physiological Days, 3.-5.2.2015, Brno, Czech Republic (Lucia Lauková, Emese Domonkos)

RECOOP Bridges in Life Sciences 10th Annual Scientific Conference, 16.-19.4.2015, Wroclaw, Poland (Katarína Šebeková, Ivana Koborová, Radana Gurecká, Melinda Csongová, Jana Hlinková)
aw, Poland (Katarína Šebeková, Ivana Koborová, Radana Gurecká, Melinda Csongová, Jana Hlinková)

ISEV 2015 - International Society of Extracellular Vesicles, 23.-26.4.2015, Washington DC, USA (Barbora Konečná)

22nd European Congress on Obesity (ECO2015), 6.-9.5.2015, Praha, Czech Republic (Katarína Šebeková, Ivana Koborová, Radana Gurecká, Melinda Csongová)

2nd International Meeting on Cell-Free DNA, 28.-29.5.2015, Copenhagen, Denmark (Peter Celec, Barbora Izrael Vlková)

99th Annual conference of the German Society for Pathology 2015, 28.-31.05.2015, Frankfurt, Germany (Alexandra Wagnerová)

OCC World Congress 2015 "Oxidants and Antioxidants in Biology", 24-26.6.2015, Valencia, Spain (Július Hodosy, Ľubomíra Tóthová)

8th World Congress on Diabetes & Obesity, 1.-4.7.2015, Riga, Latvia (Katarína Šebeková, Ivana Koborová, Melinda Csongová)

12th International Symposium on the Maillard Reaction, 1.-4.9.2015, Tokyo, Japan (Radana Gurecká, Katarína Šebeková)

20. konference patologické a klinické fyziologie, 22.-24.9.2015, Pilsen, Czech Republic (Jozef Čonka, Lucia Lauková, Veronika Melišková)

In 2015, employees and PhD students from IMBM actively attended the following domestic conferences:

XIII. Slovak obesity days with international participation, 13.-14.11.2015, Trnava, Slovak Republic (Ivana Koborová, Melinda Csongová)

Gastroenterology day, 5.11.2015, Bratislava, Slovak Republic (Veronika Melišková)

8th Slovak Conference of Children Nephrology, 19.-20.11.2015, Bratislava, Slovak Republic (Peter Celec, Radana Gurecká, Janka Bábíčková, Katarína Šebeková, Ľubomíra Tóthová)

Foreign stays

Department of Pharmacodynamics, Semmelweis University, Budapest, Hungary, 1.9.2014 - 2.2.2015, Visegrad/V4EaP Scholarship (Ivana Koborová)

New York Medical College, Department of Cell Biology and Anatomy, Valhalla, New York, USA, 1.10.2014 – 31.7.2015, National Scholarship Programme of the Slovak Republic (Veronika Borbélyová)

Central Institute of Mental Health, Medical Faculty Mannheim, Heidelberg University, Heidelberg, Germany, 15.9.2015 - 15.7.2016, National Scholarship Programme of the Slovak Republic (Emese Domonkos)

Krefting Research Centre, University of Gothenburg, Gothenburg, Sweden, 5.1. - 30.6.2015, National Scholarship Programme of the Slovak Republic; 1.9.2015 - 11.5.2016, Gothenburg University Scholarship (Barbora Konečná)

Division of Mucosal & Salivary Biology, Dental Institute, King's College London, London, Great Britain, 1.10.2015 - 31.7.2016, National Scholarship Programme of the Slovak Republic (Katarína Janšáková)

Clinical Institute of Pathology, Medical University of Vienna, Viedeň, Rakúsko, 1.10.2015 - 31.3.2016, National Scholarship Programme of the Slovak Republic (Alexandra Kovalčíková, Marianna Gyurászová)

Invited lectures of researchers from IMBM

In 2015, the researchers from IMBM were invited to several domestic and international scientific meetings and seminars to give a solicited talk focused on the presentation of their own original results.

Conferences

Celec P. Fetal DNA and preeclampsia. 2nd International Meeting on Cell-Free DNA, 28.-29.5.2015, Copenhagen, **Denmark**

Šebeková K. Pathophysiological effects of advanced glycation end products in the diet. 5th International Scientific and Educational Symposium on regenerative medicine in Slovak Republic, 17.9.2015, Bratislava, **Slovak Republic**

Šebeková K. Centrally obese women present low sRAGE but unaltered SSAO/sVAP-1 levels regardless of presence/absence of additional cardiometabolic risk factors. EASD Study Group: Reactive Metabolites in Diabetes, 17.10.2015, Heidelberg, **Germany**

Seminars

Hodosy J. Anaesthesia and methods of pain relief. Suffering and evaluation of suffering. Basic and appropriate physiology in rats, mice, guinea pigs and rabbits. State Veterinary and Food Administration, Bratislava, Slovak Republic

Celec P. University – education or research? Comenius University, Bratislava, Slovak Republic

Celec P. Evidence-based medicine. Evenings on the methodology in sciences at Comenius University, Bratislava, Slovak Republic

Celec P. Molecular Biomedicine: sci-fi today. Nano-bio-info-cognitive technologies and human in 21st century, Goethe Institute, Bratislava, Slovak Republic

Team of IMBM. Wednesday with molecular biomedicine. Centre of Scientific and Technical Information, Slovak Republic, Bratislava, Slovak Republic

Education activities

IMBM is a research institute, but researchers at the institute are sure that it is important to participate in teaching. Beyond institutional meetings, seminars and courses we have lectures, seminars and practical courses at the Faculty of medicine and at the Faculty of natural sciences:

Faculty of medicine
at the Comenius University
Physiology
Pathophysiology
Pathology

Faculty of natural sciences
Molecular endocrinology
Basics of theoretical and experimental medicine
Animal physiology and ethology
Progress in molecular biology
Advanced methods in molecular biology
Behavioral genetics, Specific genetics

Prizes

Gold medal of Slovak Medical Association

Assoc. Prof. Katarína Šebeková, MD., DrSc.

Guoth prize of the Slovak Medical Association

Assoc. Prof. Peter Celec, MD., Ing., MSc., DrSc., MPH.

Ig Nobel prize

Team of researchers from IMBM and the Institute of Physiology of the Faculty of Medicine, Comenius University for the publication about the persistence of male DNA in female saliva after kissing.

SLS
SkMA
Slovenská lekárska spoločnosť
Slovak Medical Association

International cooperations

Department of Internal Medicine, Krefting Research Centre, University of Gothenburg, Gothenburg, **Sweden** (prof. Jan Lötvall)

Department of Obstetrics and Gynecology, Sahlgrenska University Hospital/Ostra, Gothenburg, **Sweden** (prof. Bo Jacobsson)

Department of Clinical Microbiology, Karolinska University Hospital, Stockholm, **Sweden** (Dr. Milan Chromek)

Department of Obstetrics and Gynaecology, University Hospital Hradec Kralove, Charles University, Hradec Kralove, **Czech republic** (Dr. Marián Kácerovský)

Department of Pathological Physiology, Faculty of medicine, Masaryk University, Brno, **Czech republic** (prof. Katerina Kaňková)

Institute of Clinical Biochemistry and Laboratory Diagnostics, Charles University, Prague, **Czech republic** (prof. Marta Kalousová)

1st Department of Obstetrics and Gynecology, Semmelweis University, Budapest, **Hungary** (prof. Bálint Nagy)

Department of Pharmacodynamics, Semmelweis University, Budapest, **Hungary** (prof. Eva Szökö)

Neuromorphological and Neuroendocrine Research Laboratory of the Semmelweis University and the Hungarian Academy of Sciences, Budapest, **Hungary** (prof. Miklós Palkovits)

Department of Haemostasis and Haemostatic Disorders, Medical University of Lodz, Lodz, **Poland** (prof. Cezary Watala)

Department of Internal Medicine, University of Würzburg and KfH Kidney Center, Würzburg, **Germany** (prof. August Heidland)

Department of Nutritional and Physiological Chemistry, University of Vienna, Vienna, **Austria** (prof. Veronika Somoza)

Department of Cell Biology & Anatomy, New York Medical College, New York, **USA** (prof. Jana Veliskova)

Department of Neurology, NYU Langone Medical Center, New York, **USA** (Dr. Henrieta Scholtzova)

Division of Gastroenterology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, **USA** (prof. Chiang J. Li)

The Department of Genomics and Health, CSISP, Valencia, **Spain** (Dr. Mária Džunková)

Department of psychology, Faculty of Arts, Palackého University in Olomouc, **Czech republic** (Dr. Matúš Šucha)

Publications of IMBM in IF journals in 2015

1. Banasova L, **Kamodyova N**, **Jansakova K**, **Tothova L**, Stanko P, Turna J, **Celec P**: Salivary DNA and markers of oxidative stress in patients with chronic periodontitis. Clinical Oral Investigations, 19(2):201-7, 2015 (IF=2,285)

2. **Vlkova B**, Turna J, **Celec P**: Fetal DNA in maternal plasma in preeclamptic pregnancies. Hypertension in Pregnancy, 34(1):36-49, 2015 (IF=1,192)

3. **Konecna B, Borbelyova V, Celec P, Vlkova B**: Does rat fetal DNA induce preeclampsia in pregnant rats? Journal of Developmental Origins of Health and Disease, 6(1):5-9, 2015 (IF=0,765)

4. Mego M, Karaba M, **Minarik G**, Benca J, Sedlacková T, **Tothova L, Vlkova B**, Cierna Z, Janega P, Luha J, Gronesova P, Pindak D, Fridrichova I, **Celec P**, Reuben JM, Cristofanilli M, Mardiak J: Relationship between Circulating Tumor Cells, Blood Coagulation, and Urokinase-Plasminogen-Activator System in Early Breast Cancer Patients. Breast Journal, 21(2):155-60, 2015 (IF=1,433)

5. Stürmer M, **Sebekova K**, Fazeli G, Bahner U, Stäb F, Heidland A. 25-Hydroxyvitamin D and Advanced Glycation Endproducts in Healthy and Hypertensive Subjects: Are There Interactions? Journal of Renal Nutrition, 26:209-216, 2015 (IF=2,548)

6. Durdiakova J, **Celec P**, Laznibatova J, **Minarik G**, Lakatosova S, Kubranska A, Ostatnikova D: Differences in salivary testosterone, digit ratio and empathy between intellectually gifted and control boys. Intelligence, 48:76-84, 2015 (IF=3,162)

7. **Repiska G, Sedlackova T**, Szemes T, **Minarik G**: Effect of different DNA concentration methods on performance of non-invasive fetal y-chromosomal short tandem repeat profiling from maternal plasma. Fetal Diagnosis and Therapy, 37(1):58-64, 2015 (IF=2,295)

8. Kralova-Hromadova I, **Minarik G**, Bazsalovicsova E, Mikulicek P, Oravcova A, Palkova L, Hanzelova V: Development of microsatellite markers in Caryophyllaeus laticeps (Cestoda: Caryophyllidea), monozoic fish tapeworm, using next-generation sequencing approach. Parasitology Research, 114(2):721-6, 2015 (IF=2,327)

9. Havranek T, Zatkova M, Lestanova Z, Bacova Z, Mravec B, **Hodosy J**, Strbak V, Bakos J: Intracerebroventricular oxytocin administration in rats enhances object recognition and increases expression of neurotrophins, microtubule-associated protein 2, and synapsin I. Journal of Neuroscience Research, 93(6):893-901, 2015 (IF=2,729)

10. Kalenski J, Mancina E, Paschenda P, Beckers C, Bleilevens C, Tothova L, **Boor P**, Doorschodt BM, Tolba RH: Improved preservation of warm ischemia-damaged porcine kidneys after cold storage in Ecosol, a novel preservation solution. Annals of Transplantation, 27(20):233-242, 2015 (IF=1,261)

11. Filova B, Malinova M, **Babickova J, Tothova L**, Ostatnikova D, **Celec P, Hodosy J**: Effects of testosterone and estradiol on anxiety and depressive-like behavior via a non-genomic pathway. Neuroscience Bulletin, 31(3):288-296, 2015 (IF=2,509)

12. **Babickova J, Borbelyova V, Tothova L**, Kubisova K, Janega P, **Hodosy J, Celec P**: The renal effects of prenatal testosterone in rats. The Journal of Urology, 193(5):1700-1708, 2015 (IF=4,471)

13. **Jansakova K, Babickova J**, Filova B, Lengyelova E, Havrlentova M, Kraic J, **Celec P, Tothova L**: Anthocyanin-Rich Diet in Chemically Induced Colitis in Mice. Folia Biologica, 61:104-109, 2015 (IF=0,78)

14. **Gurecka R, Koborova I, Jansakova K**, Tabi T, Szökő E, Somoza V, **Sebekova K, Celec P**: Prenatal dietary load of Maillard reaction products combined with postnatal Coca-Cola drinking affects metabolic status of female Wistar rats. Croatian Medical Journal, 56(2):94-103, 2015 (IF=1,305)

15. **Sebekova K**, Stürmer M, Fazeli G, Bahner U, Stäb F, Heidland A: Is vitamin d deficiency related to accumulation of advanced glycation end products, markers of inflammation, and oxidative stress in diabetic subjects? Biomed Research International, 2015:958097, 2015 (IF=1,579)

16. Santoro D, Caccamo D, Lucisano S, Buemi M, **Sebekova K**, Teta D, De Nicola L: Interplay of Vitamin D, Erythropoiesis, and the Renin-Angiotensin System. Biomed Research International, 2015:145828, 2015 (IF=1,579)

17. Dusinska M, Boland S, Saunders M, Juillerat-Jeanneret L, Tran L, Pojana G, Marcomini A, Volkovova K, Tulinska J, Knudsen LE, Gombau L, Whelan M, Collins AR, Marano F, Housiadas C, Bilanicova D, Halamoda Kenzaoui B, Correia Carreira S, Magdolenova Z, Fjellsbo LM, Huk A, Handy R, Walker L, Barancokova M, Bartonova A, Burello E, Castell J, Cowie H, Drlickova M, Guadagnini R, Harris G, Harju M, Heimstad ES, Hurbankova M, Kazimirova A, Kovacikova Z, Kuricova M, Liskova A, Milcamps A, Neubauerova E, Palosaari T, Papazafiri P, Pilou M, Poulsen MS, Ross B, Runden-Pran E, **Sebekova K**, Staruchova M, Vallotto D, Worth A: Towards an alternative testing strategy for nanomaterials used in nanomedicine: lessons from NanoTEST. Nanotoxicology, 9 Suppl 1:118-32, 2015 (IF=6,411)

18. **Gurecka R, Koborova I**, Sebek J, **Sebekova K**: Presence of Cardiometabolic Risk Factors Is Not Associated with Microalbuminuria in 14-to-20-Years Old Slovak Adolescents: A Cross-Sectional, Population Study. PLoS One, 10(6):e0129311, 2015 (IF=3,234)

19. Krivosikova Z, Gajdos M, **Sebekova K**: Vitamin D Levels Decline with Rising Number of Cardiometabolic Risk Factors in Healthy Adults: Association with Adipokines, Inflammation, Oxidative Stress and Advanced Glycation Markers. PLoS One, 10(6):e0131753, 2015 (IF=3,234)

20. Santoro D, **Sebekova K**, Teta D, De Nicola L: Extraskeletal Functions of Vitamin D. Biomed Research International, 2015:294719, 2015 (IF=1,579)

21. **Gardlik R**, Fusekova I: Pharmacologic therapy for diabetic retinopathy. Seminars in Ophthalmology, 30(4):252-63, 2015 (IF=0,863)

22. **Celec P**, Ostatníkova D, **Hodosy J**: On the effects of testosterone on brain behavioral functions. Frontiers in Neuroscience, 9:12, 2015 (IF=3,7)

23. Radvanszky J, Surovy M, Nagyova E, **Minarik G**, Kadasi L: Comparison of different DNA binding fluorescent dyes for applications of high-resolution melting analysis. Clinical Biochemistry, 48(9):609-16, 2015 (IF=2,275)

24. **Boor P**, Floege J: Renal allograft fibrosis: biology and therapeutic targets. American Journal of Transplantation, 15(4):863-86, 2015 (IF=5,683)

25. **Boor P**, Papasotiriou ME: If you lose your nerves, at least you will not get kidney fibrosis! Kidney International, 87(2):275-7, 2015 (IF=8,563)

26. Toivola DM, **Boor P**, Alam C, Strnad P: Keratins in health and disease. Current Opinion in Cell Biology, 32:73-81, 2015 (IF=8,467)

27. Mancina E, Kalenski J, Paschenda P, Beckers C, Bleilevens C, **Boor P**, Doorschodt BM, Tolba RH: Determination of the preferred conditions for the isolated perfusion of porcine kidneys. European Surgical Research, 54(1-2):44-54, 2015 (IF=2,474)

28. **Babickova J, Tothova L**, Lengyelova E, Bartonova A, **Hodosy J, Gardlik R, Celec P**: Sex differences in experimentally induced colitis in mice: a role for estrogens. Inflammation, 38(5):1996-2006, 2015 (IF=2,208)

29. Kacerovsky M, **Tothova L**, Menon R, **Vlkova B**, Musilova I, Hornychova H, Prochadzka M, **Celec P**: Amniotic fluid markers of oxidative stress in pregnancies complicated by preterm prelabor rupture of membranes. Maternal-Fetal and Neonatal Medicine, 28(11):1250-1259, 2015 (IF=1,367)

30. **Kamodyova N**, Banasova L, **Jansakova K, Koborova I, Tothova L**, Stanko P, **Celec P**: Blood contamination in saliva: impact on the measurement of salivary oxidative stress markers. Disease Markers, 2015:1-10, 2015 (IF=1,562)

31. **Boor P, Babickova J**, Steegh F, Hautvast P, Martin IV, Djudjaj S, Nakagawa T, Ehling J, Gremse F, Bücher E, Eriksson U, van Roeyen CR, Eitner F, Lammers T, Floege J, Peutz-Kootstra CJ, Ostendorf T: Role of platelet-derived growth factor-CC in capillary rarefaction in renal fibrosis. American Journal of Pathology, 185(8):2132-42, 2015 (IF=4,591)

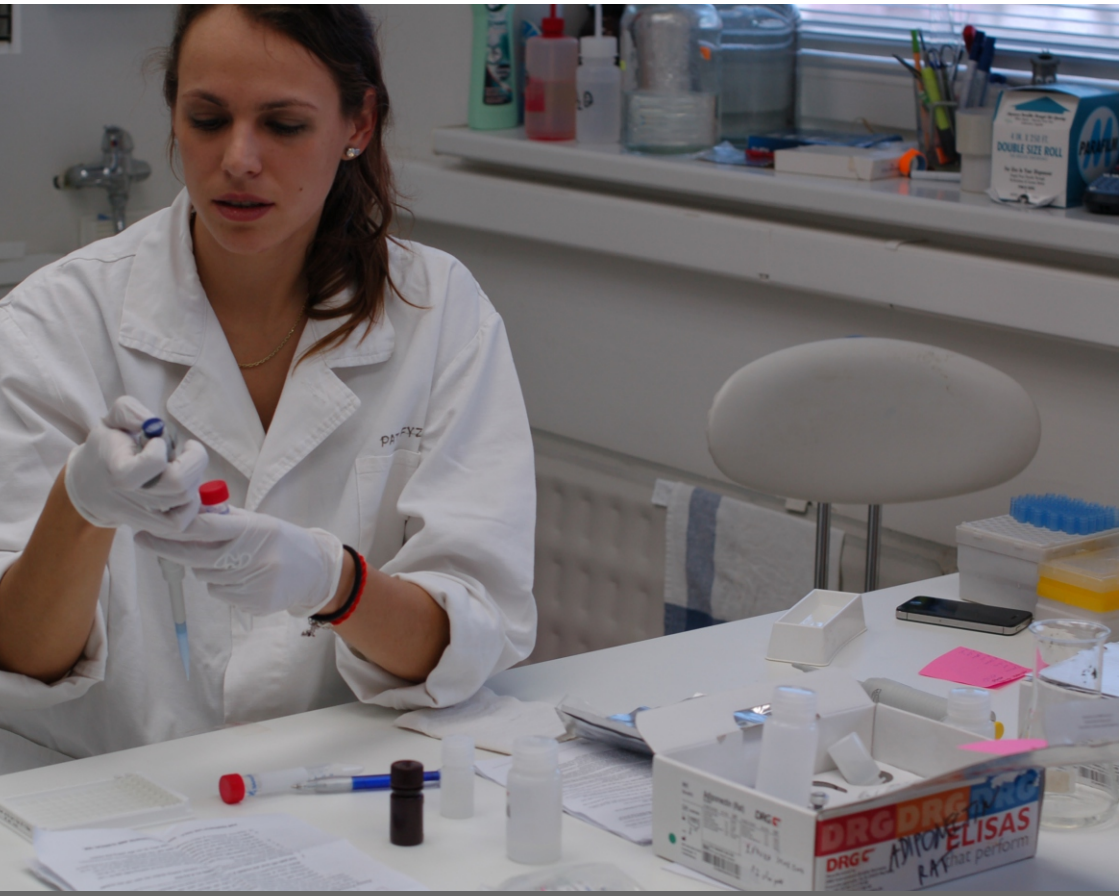
32. **Celec P, Tothova L, Sebekova K**, Podracka L, **Boor P**: Salivary markers of kidney function - Potentials and limitations. Clinica Chimica Acta, 453:28-37, 2015 (IF=2,824)

33. **Tothova L, Kamodyova N**, Cervenka T, **Celec P**: Salivary markers of oxidative stress in oral diseases. Frontiers in Cellular and Infection Microbiology, 5:73, 2015 (IF=3,719)

34. **Minarik G, Repiska G**, Hyblova M, Nagyova E, Soltys K, Budis J, Duris F, Sysak R, Gerykova Bujalkova M, **Vlkova-Izrael B**, Biro O, Nagy B, Szemes T: Utilization of Benchtop Next Generation Sequencing Platforms Ion Torrent PGM and MiSeq in Noninvasive Prenatal Testing for Chromosome 21 Trisomy and Testing of Impact of In Silico and Physical Size Selection on Its Analytical Performance. PLoS One, 10(12):e0144811, 2015 (IF=3,234)

35. Mego M, Cierna Z, Janega P, Karaba M, **Minarik G**, Benca J, **Sedlackova T**, Sieberova G, Gronesova P, Manasova D, Pindak D, Sufliarsky J, Danihel L, Reuben JM, Mardiak J: Relationship between circulating tumor cells and epithelial to mesenchymal transition in early breast cancer. BMC Cancer, 15:533, 2015 (IF=3,362)

36. **Babickova J, Gardlik R**: Pathological and therapeutic interactions between bacteriophages, microbes and the host in inflammatory bowel disease. World Journal of Gastroenterology, 21(40):11321-30, 2015 (IF=2,369)



Grant projects of IMBM in 2015

Structural funds of the EU

A competence center for research and development in the field of molecular medicine
ITMS 26240220071

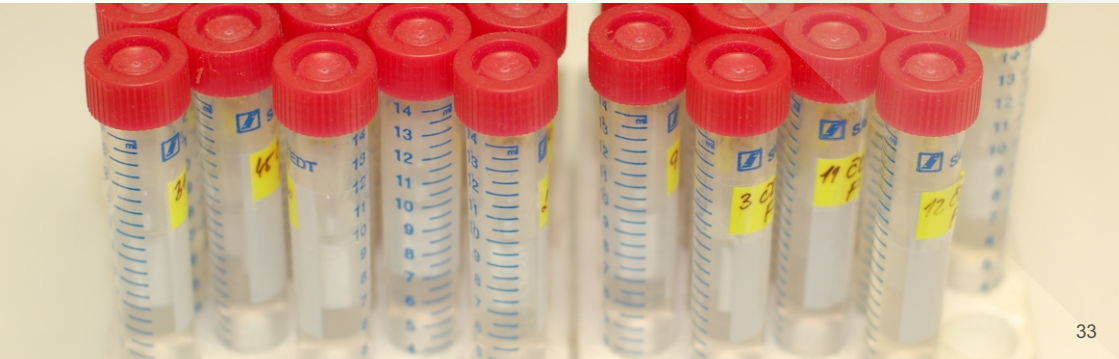
University Science Park at Comenius University in Bratislava
ITMS 26240220086

University science park for biomedicine Bratislava
ITMS 26240220087

APVV grants

APVV-0539-12
Salivary steroids and their effect on the spatial orientation, depending on prenatal testosterone
Július Hodosy, MD., MSc., PhD., MPH.
128 430 €
2013-2016

APVV-0447-12
The metabolic syndrome in adolescents
Assoc. Prof. Katarína Šebeková, MD., DrSc.
194 497 €
2013-2016



VEGA grants

VEGA 1/0048/14

Research inherited forms of hearing impairment using new-generation sequencing (NGS)

Gabriel Minárik, MSc., PhD.

46 110 €

2014-2016

VEGA1/0222/14

The effect of testosterone and estradiol in the development and progress of renal fibrosis in a model of recurrent urinary tract infections

Ľubomíra Tóthová, MSc., PhD.

17 583 €

2014-2016

VEGA2/0080/13

The effect of the genetic control of nitric oxide and dopamine re-uptake in the sensorimotor gating in man

Gabriel Minárik, MSc., PhD.

34 119 €

2013-2015

VEGA1/0406/13

Non-genomic effects of testosterone on behavior

Assoc. Prof. Peter Celec, MD., Ing., MSc., DrSc., MPH.

30 750 €

2013-2015

VEGA1/0637/13

The metabolic syndrome in adolescents

Assoc. Prof. Katarína Šebeková, MD., DrSc.

17 877 €

2013-2015

Grants of the Comenius University

UK/315/2015
The role of estradiol and estrogen receptors in the colitis
MSc. Bábíčková Janka, PhD.
1000 €

UK/21/2015
Non-genomic effects of testosterone on the cognitive functions of rats
MSc. Domonkos Emese
1000€

UK/127/2015
The relationship EN-RAGE-ER to insulin resistance and central obesity in adolescents
MSc. Gurecká Radana
1000 €

UK/388/2015
Monitoring glomerular damage in mice with nephrotoxic serum nephritis
MSc. Gyurászová Marianna
1000 €

UK/13/2015
The effect of E. coli Nissle 1917 to the level of IL-10 and TNF in mice
MSc. Hlinková Jana
1000 €

UK/147/2015
The effect of nucleic acids for the development of preeclampsia symptoms in animal model
MSc. Konečná Barbora
1000€

UK/369/2015

Identification, characterization and genetic modification of bacteria derived from the body surface of mouse (Mus musculus) and their potential applications in molecular medicine

MSc. Pálková Lenka

1000 €

UK/102/2015

Detection of fetal DNA in exosomes isolated from the maternal body fluids

MSc. Repiská Gabriela

1000 €

Where to find us?

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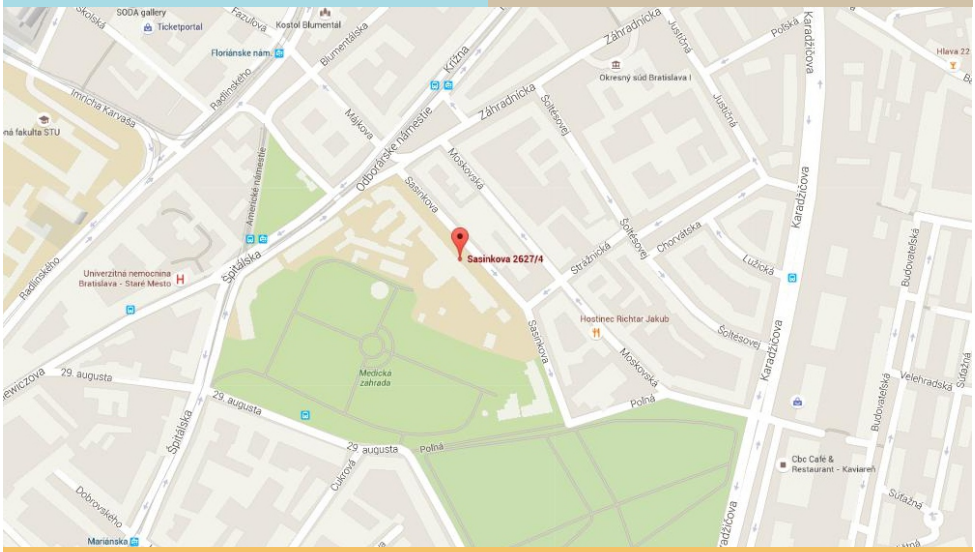

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