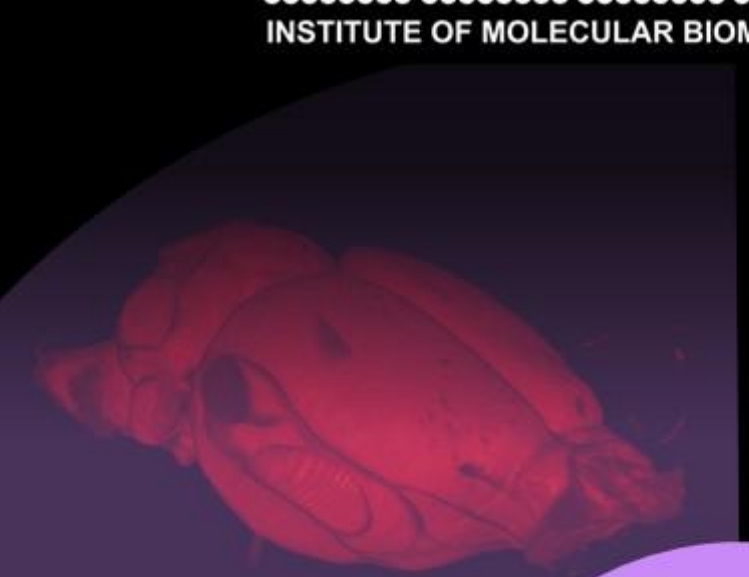
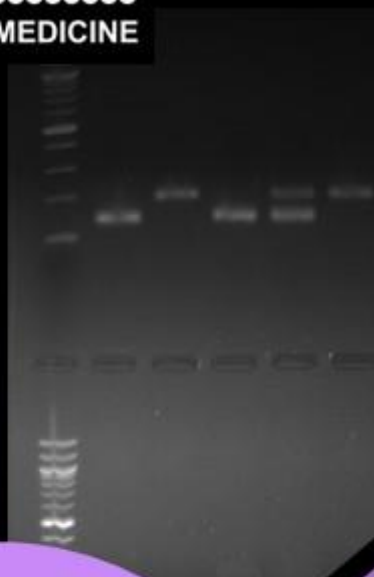
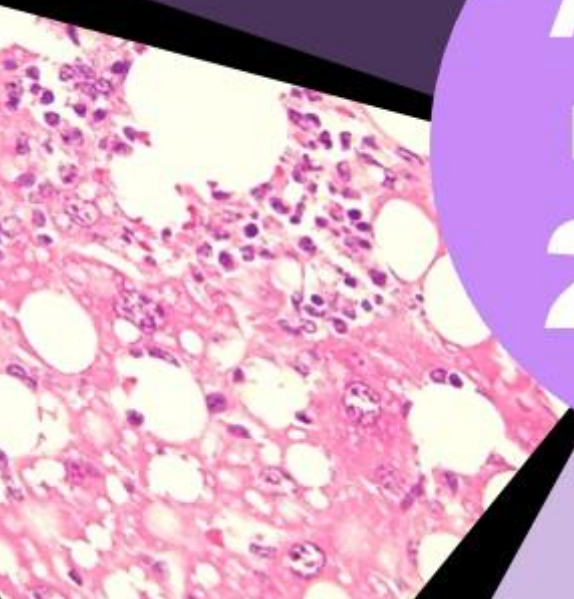
INSTITUTE OF MOLECULAR BIOMEDICINE





Annual report 2024



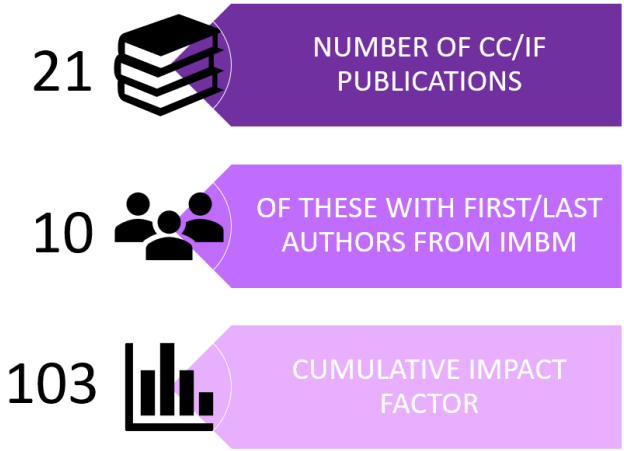
IMBM 2024

1 research institute
15 years
2 professors
6 associate professors
7 postdocs
19 PhD students
18 diploma thesis students
12 bachelor students
1 HORIZON EUROPE grant
5 APVV grants
4 VEGA grants
9 UK grants
21 CC/IF publications

INSTITUTE OF MOLECULAR BIOMEDICINE

SCIENTOMETRIC DATA, YEAR 2024

NUMBER OF CC/IF PUBLICATIONS: 21
OF THESE WITH FIRST/LAST AUTHORS FROM IMBM: 10
CUMULATIVE IF: 103.3



INSTITUTE OF MOLECULAR BIOMEDICINE

THE YEAR 2024 AT IMBM

THE VIEW OF THE HEAD OF THE INSTITUTE

The year 2024 was once again eventful. Our achievements include four defended dissertations, 18 successfully defended diploma theses, one newly habilitated associate professor, participation in 21 conferences, four international research stays, and numerous outreach activities and media contributions. A significant milestone was the inauguration of our first head as a professor - congratulations to **Professor Peter Celec!**

We also welcomed new colleagues to our team. Three researchers who recently completed their doctoral studies seamlessly transitioned into postdoctoral positions, while five new doctoral students embarked on their Ph.D. journey with us. I am confident that their determination and diligence will drive the institute forward.

During the summer, we hosted the traditional **Summer School of Biomedicine**, welcoming students from universities across Slovakia and beyond. We believe that our efforts contribute not only to enhancing the reputation of the Faculty of Medicine but also to strengthening the standing of **Comenius University** as a whole.

Our **mission** remains unchanged: to serve as a leading scientific center within the faculty and university, with an international reach. Achieving this goal would not be possible without the support of our partners from Slovakia and abroad. At the same time, we are dedicated to educating professionals—individuals who are not only highly skilled but also personally and professionally mature, with a strong sense of social responsibility, strategic thinking, and, above all, a compassionate heart.

Roman Gardlík

RESEARCHERS AT IMBM

PROFESSORS:

PETER BOOR, prof., MD, PhD
CC/IF publications - 425, SCI citations - 10883, h-index -61
renal fibrosis, nephropathology, immunopathomechanisms, models of renal diseases, imaging
boor.peter@gmail.com
pboor@ukaachen.de



PETER CELEC, prof., MD, MSc, Ing, DrSc, MPH
CC/IF publications - 352, SCI citations - 5295, h-index - 38
extracellular DNA, testosterone, salivary biomarkers, sepsis
peter.celec@imbm.sk



ROMAN GARDLÍK, assoc.prof., MD, MSc, PhD
CC/IF publications - 87, SCI citations - 1377, h-index - 21
inflammatory bowel disease, acute and chronic liver disease, animal models, extracellular DNA, microbiome
roman.gardlik@imbm.sk



JÚLIUS HODOSY, assoc. prof., MD, MSc, PhD, MPH
CC/IF publications - 107, SCI citations - 1943, h-index - 25
sex steroids, oxidative stress, sepsis, sleep apnea syndrome, traumatic brain injury
julius.hodosy@imbm.sk



KATARÍNA ŠEBEKOVÁ, assoc. prof., MD, DrSc
CC/IF publications - 193, SCI citations - 3813, h-index - 35
metabolic syndrome, diabetes mellitus,
advanced glycation end products, clinical biochemistry, pathogenesis of renal diseases
katarina.sebekova@imbm.sk





ĽUBOMÍRA TÓTHOVÁ, assoc.prof., PhD
CC/IF publications - 105, SCI citations - 1838, h-index - 23
salivary markers, oxidative stress, urinary tract infections, experimental nephrology, bacteriophages
lubomira.tothova@imbm.sk



BARBORA VLKOVÁ, assoc. prof., MSc, PhD
CC/IF publications - 84, SCI citations - 1257, h-index - 16
extracellular DNA, non-invasive prenatal diagnostics, neutrophils, pneumonia, sepsis, molecular pathology
barbora.vlkova@imbm.sk



MICHAL PASTOREK, assoc. prof., MSc, PhD
CC/IF publications - 47, SCI citations - 489, h-index - 14
Sepsis, neutrophil biology, sterile inflammation, autoimmune diseases
michal.pastorek@imbm.sk

POSTDOCS:



JANKA BÁBÍČKOVÁ, MSc, PhD
CC/IF publications - 53, SCI citations - 1182, h-index - 17
phage display, sex steroids, inflammatory bowel disease, extracellular DNA, experimental nephrology
jana.babickova@gmail.com



VERONIKA BORBÉLYOVÁ, MSc, PhD
CC/IF publications - 42, SCI citations - 324, h-index - 10
animal models, autism spectrum disorder, obesity, metabolic syndrome, sex hormones
veronika.borbelyova@imbm.sk

BARBORA TAMÁŠOVÁ, MSc, PhD
CC/IF publications - 43, SCI citations - 572, h-index - 13
extracellular DNA, extracellular vesicles,
pregnancy complications, quantitative real-time PCR
barbora.konecna@imbm.sk



EMESE RENCZÉS, MSc, PhD
CC/IF publications - 32, SCI citations - 326, h-index - 10
sex hormones, behavioral phenotyping in rats and mice,
mental disorders, autism
emese.domonkos@imbm.sk



ĽUBICA JANOVIČOVÁ, MSc, PhD
CC/IF publications - 18, SCI citations - 158, h-index - 6
extracellular DNA, DNase activity, sepsis, anemia, animal models
lubica.janovicova@imbm.sk



BARBORA GROMOVÁ, MSc, PhD
CC/IF publications - 22, SCI citations - 137, h-index - 7
DNase activity, extracellular DNA, purinergic signalling pathway, inflammatory bowel disease and liver disease
barbora.gromova@imbm.sk



KRISTÍNA MACÁKOVÁ, MSc, PhD
CC/IF publications - 9, SCI citations - 15, h-index - 2
rheumatoid arthritis, extracellular DNA, neutrophils
kristina.macakova@imbm.sk



Students at IMBM

PHD STUDENTS AT IMBM IN 2024:
Katarína Kmeťová, MSc.
Alena Potočárová, DVM
Kristína Macáková, MSc.
Jakub Szabó, MA.
Monika Janíková, MSc.
Barbora Gromová, MSc.
Kristína Lichá, MSc.
Paulína Belvončíková, MSc.
Emil Bečka, MSc.
Petronela Sušienková, M.A.
Andrej Feješ, MSc.
Tomáš Strečanský MSc.
Nikola Tóthová MSc.
Letícia Hudecová MSc.
Emma Skybová, M.A.
Karolína Bíla, Ing.
Patrik Bertovič, MSc.
Filip Baran, MSc.
Peter Bielik, MSc.



MASTER STUDENTS AT IMBM IN 2024:
Anna Farkašová
Monika Maxianová
Nikola Dudová
Zuzana Matulová
Ján Pivko
Tetiana Pidlypska, BSc.
Alexandra Hladíková BSc.
Gabriela Forraiová BSc.
Jana Grambličková BSc.
Dominika Daňová BSc.
Karolína Gubišová BSc.
Bernhard Maximilian Schuh
Marwin Jamal Shir
Tim Groß
Evangelos Zgempas
Alexander Florian Faber
Jázmin Orsolya Takácsová BSc.
Miriam Antlová BSc.

BACHELOR STUDENTS AT IMBM IN 2024:
Natália Krajčovičová
Nelia Korotushak
Stela Stankovičová
Marek Oslacký
Miriam Antlová
Janka Klimová
Adela Miklovičová
Rebeka Roninová
Annamária Sekeráková
Emma Zemanová
Samuel Vakrčka

PhD STUDENTS WHO SUCCESSFULLY DEFENDED THEIR THESIS IN 2024:
Katarína Kmeťová, MSc.
Kristína Macáková, MSc.
Jakub Szabó, MA.
Barbora Gromová, MSc.



MASTER STUDENTS WHO SUCCESSFULLY DEFENDED THEIR THESES IN 2024:
Anna Farkašová
Monika Maxianová
Nikola Dudová
Zuzana Matulová
Ján Pivko
Alexandra Hladíková BSc.
Gabriela Forraiová BSc.
Jana Grambličková BSc.
Dominika Daňová BSc.
Karolína Gubišová BSc.
Bernhard Maximilian Schuh
Marwin Jamal Shir
Tim Groß
Petra Papšová, BSc.

Tereza Mrázová, BSc.
Dominika Stolláriková
Matúš Šadibol
Natália Krajčovičová, BSc.



BACHELOR STUDENTS WHO SUCCESSFULLY DEFENDED THEIR THESES IN 2024:
Natália Krajčovičová BSc.
Nelia Korotushak BSc.
Stela Stankovičová BSc.
Marek Oslacký BSc.
Miriam Antlová BSc.

OTHER COLLEAGUES:
Secretary: Henrieta Vontorčíková
Lab manager: Jakub Janko, MSc., PhD
Laboratory technicians: Ingrid Simonová, Stanislava Sochová, MSc., Hanna Fedorets, Bibiana Bujačková, MSc., Emma Skybová, M.A., Regina Varga, BSc., Jakub Urban BSc.
Animal technicians: Mária Turoňová, Barnabáš Borbély
Cleaner: Kristína Michalovičová

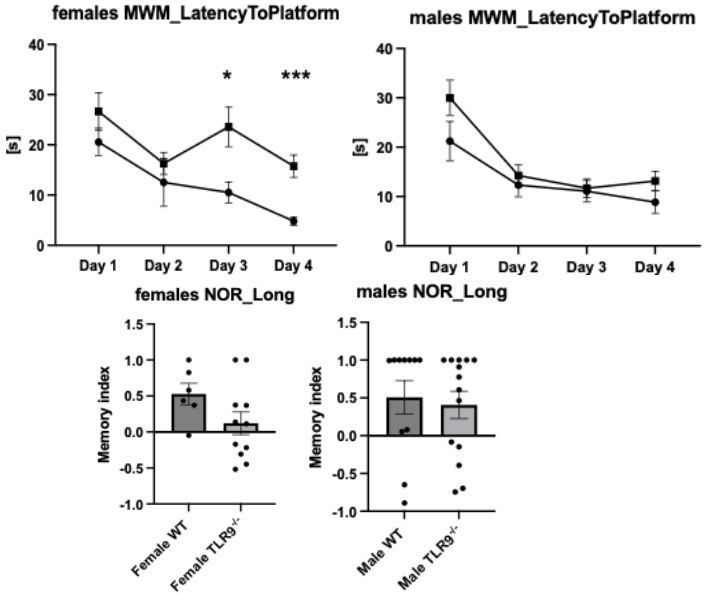
THE ROLE OF TOLL-LIKE RECEPTOR 9 IN COGNITIVE PROCESSES

What is known?

- Hippocampal memory formation might depend on Toll-like receptor 9 (TLR9) signaling, which could link DNA damage to inflammatory and DNA damage repair pathways.

What is new?

- Tlr9-/- mice exhibit slower learning during initial training but achieve comparable spatial memory performance after repeated training.
- TLR9 deficiency minimally affects short- and long-term memory in tasks without prior training.
- These results highlight a selective role for TLR9 in cognitive processes, with limited influence on sex and general memory abilities in mice.



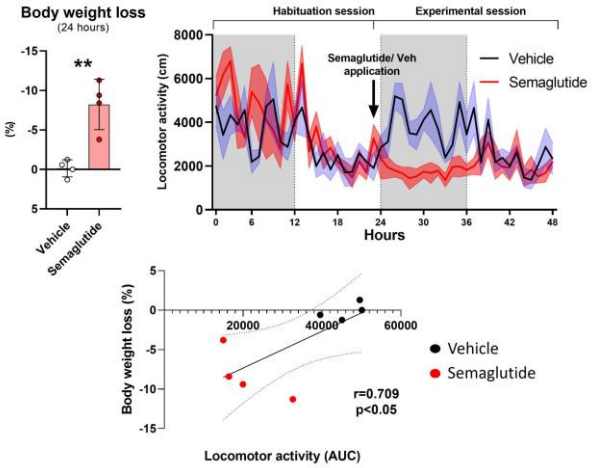
NOVEL HOME-CAGE MONITORING SYSTEM FOR ASSESSING SIDE EFFECTS OF SEMAGLUTIDE, A NEW ANTI-OBESITY DRUG

What is known?

- Patients with obesity are currently using semaglutide, a Glucagon-like peptide-1 analog, to reduce their body weight. The semaglutide treatment induces side effects such as nausea, vomiting, or diarrhea that may lead to secondary consequences such as reduced movement and food intake.

What is new?

- The home-cage monitoring system allows stress-free observation of animals in a controlled, naturalistic environment, ensuring accurate behavioral and physiological data.
- Using a home-cage monitoring system, we observed 12 hours of reduced locomotor activity following semaglutide treatment, which was strongly associated with reduced body weight.
- These results highlight the potential of using home-cage monitoring systems to evaluate the side effects of semaglutide in experimental studies.



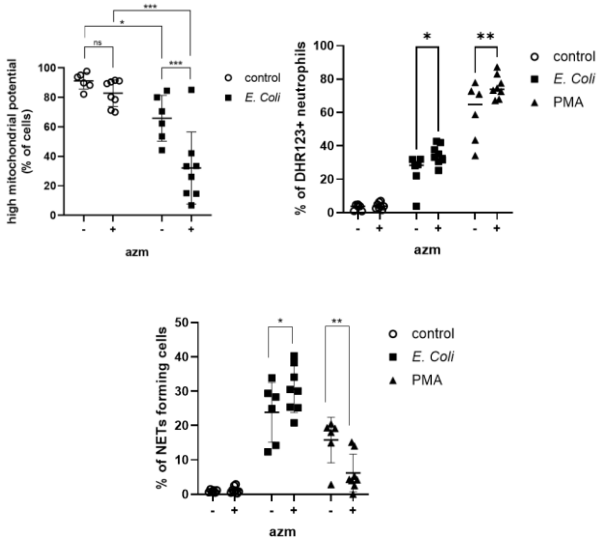
THE EFFECT OF ANTIBIOTICS ON THE FUNCTION OF THE INNATE IMMUNE RESPONSE

What is known?

- Azithromycin affects mitochondrial health and subsequent neutrophil defense mechanisms.

What is new?

- Chronic azithromycin administration led to decreased mitochondrial potential but paradoxically increased reactive oxygen species production and propensity for neutrophil extracellular traps (NETs) formation, indicating a potential pathological consequence.
- Additionally azithromycin led to a decrease in the total antioxidant capacity in the blood, which, in turn resulted in oxidative damage to the lipid and protein compartments of neutrophils.
- Future research will focus on the clinical implications of our findings, including optimal antibiotic treatment strategies in the context of infectious diseases and to minimize the risk of adverse outcomes associated with prolonged antibiotic exposure.



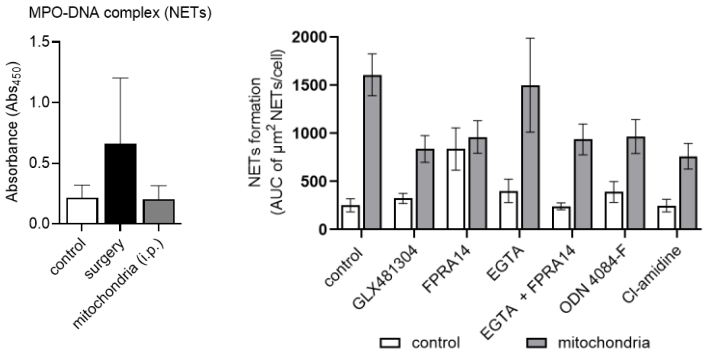
SURGERY-INDUCED TRAUMATIC INJURY AS A NOVEL ANIMAL MODEL FOR STERILE INFLAMMATION MEDIATED BY MITOCHONDRIA

What is known?

- A murine model of traumatic injury caused by surgical intervention in the peritoneal cavity shows mitochondrial release into the extracellular space.
- Neutrophils swiftly respond to these mitochondrial components, mimicking their innate immune reaction to bacterial pathogens, with swarming behavior at the injury site similar to microbial infections.
- While neutrophil swarming after surgical trauma is comparable to that induced by intraperitoneal administration of isolated mitochondria, the latter alone is relatively ineffective at inducing neutrophil extracellular trap (NET) formation in vivo.

What is new?

- NET formation via NETosis involves molecular checkpoints. While checkpoint inhibition reduces NET formation induced by mitochondria, Toll-like receptor 9 inhibition completely blocks, and formyl peptide receptor 1 blockade delays NETs formation.



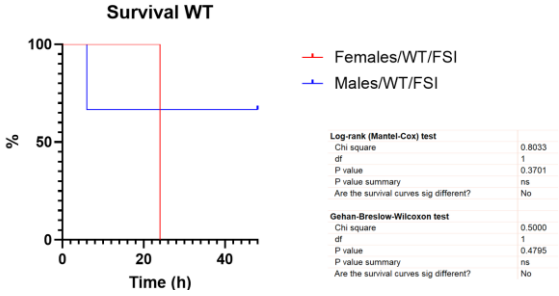
THE EFFECT OF SEX AND TOLL-LIKE RECEPTOR 9 DEFICIENCY ON THE PATHOGENESIS AND SURVIVAL OF ABDOMINAL SEPSIS IN ADULT C57BL/6

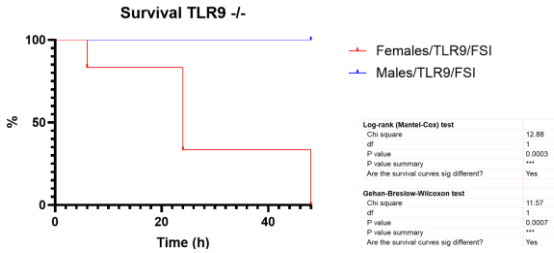
What is known?

- Sepsis is a life threatening condition that results in multiple organ failure.
- There are several determinants that could influence the overall pathogenesis and mortality of sepsis, such as sex or body weight.

What is new?

- Our data shows that mortality of female wild type (WT) mice and toll-like receptor 9 (TLR9) deficient mice reached 100% during the 48h sepsis model, with significant differences compared to male survival in case of TLR9 deficient mice.





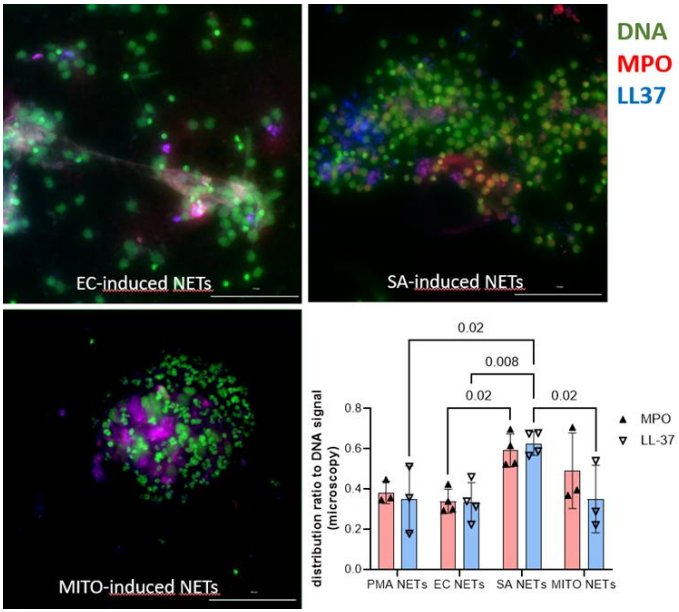
INFLUENCE OF COMPOSITION OF NEUTROPHIL EXTRACELLULAR TRAPS ON THEIR DEGRADATION

What is known?

- The type of stimulus of neutrophil extracellular traps (NETs) production affects their peptide content, which in turn affects their stability.
- The antimicrobial peptide cathelicidin, or its short form LL-37, occurs naturally on NETs and protects them from clearance.

What is new?

- NETs induced by *Staphylococcus aureus* contain a high concentration of LL-37, which causes their high resistance to degradation plasma nucleases, thus NETs remain in tissues and act cytotoxic.
- Non-degraded 100-200bp fragments are more easily recognized by the innate immunity receptor TLR9 due to the high concentration of LL-37, inducing further inflammatory processes.



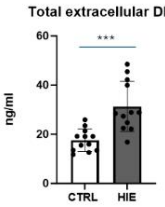
THE EFFECTS OF PHYSICAL ACTIVITY ON A MURINE MODEL OF BACTERIAL PNEUMONIA

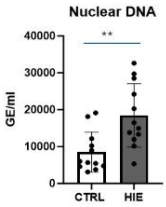
What is known?

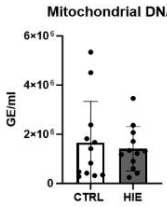
- Intense physical activity can induce a systemic inflammatory response, resembling trauma or infection, as a result of releasing DNA from dying cells.

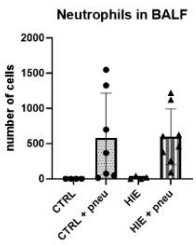
What is new?

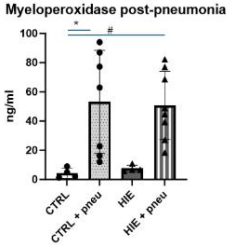
- High-intensity treadmill run led to higher plasma ecDNA concentration by 78% compared to control mice, mirrored by nuclear DNA.
- Neutrophils counts, as well as their enzymes (myeloperoxidase, neutrophil elastase) were higher in bronchoalveolar lavage fluid of both groups (control and exercise) with induced pneumonia.
- These results suggest that induced changes in extracellular DNA do not lead to an immunomodulatory effect on the progression of bacterial pneumonia in mice.

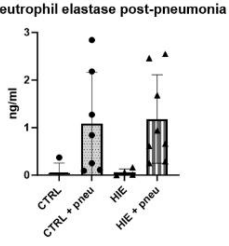












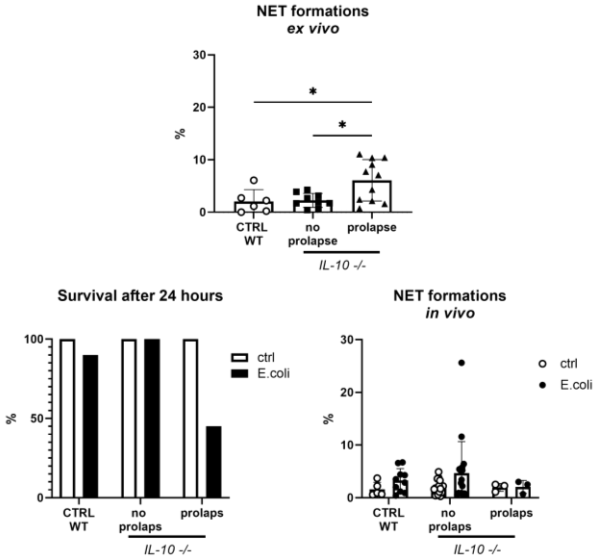
NEUTROPHIL EXTRACELLULAR TRAP FORMATION IN INTERLEUKIN-10 DEFICIENCY FOLLOWING BACTERIAL STIMULATION

What is known?

- In inflammatory bowel diseases (IBD), both the release of extracellular DNA (ecDNA) and the formation of neutrophil extracellular traps (NETs), can contribute to the progression of intestinal inflammation and increased intestinal permeability. One of the most widely used animal models for IBD are mice deficient in interleukin-10 (IL-10), that develop spontaneous colitis.

What is new?

- Neutrophils from IL-10-deficient mice with late-stage colitis (prolapse) demonstrate increased NETs formation in response to bacterial stimuli, like *Escherichia coli (E.coli)*, in *ex vivo* settings.
- When *E.coli* was administered *in vivo*, IL-10-deficient mice with prolapse showed a 50% survival rate, half that of those without prolapse.
- However, *E.coli* administration did not lead to systemic significant NET formations in all mice.



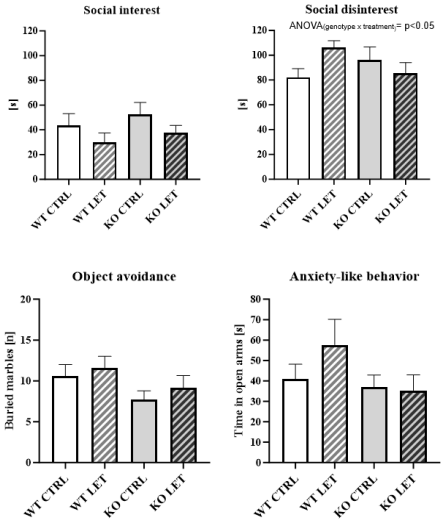
THE BEHAVIORAL EFFECT OF AROMATASE INHIBITION IN GENETIC ANIMAL MODEL OF AUTISM SPECTRUM DISORDERS

What is known?

- Estradiol is synthesized from testosterone by enzyme aromatase.
- While Extreme male brain theory described association between prenatal hyperandrogenism and autistic traits, theory about female protective factors illustrated protective role of estradiol in patients with autism spectrum disorders.

What is new?

- No effect of aromatase inhibition on social interest in Shank3$^{-/-}$ female mice was observed.
- Opposite effect of aromatase inhibition on social disinterest in wild-type (higher social disinterest) and Shank3$^{-/-}$ (lower social disinterest) female mice by trend.
- No effect of aromatase inhibition on anxiety-like behavior in Shank3$^{-/-}$ female mice was shown.



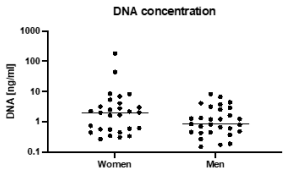
VARIABILITY OF EXTRACELLULAR DNA IN URINE AND THE ROLE OF SEX

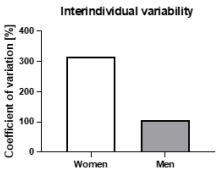
What is known?

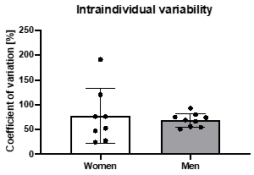
- Urinary extracellular DNA (ecDNA) seems to be a promising biomarker, for detecting various diseases like urinary tract infections, kidney injury and oncological diseases. The physiologic concentration of ecDNA in urine is not characterized.

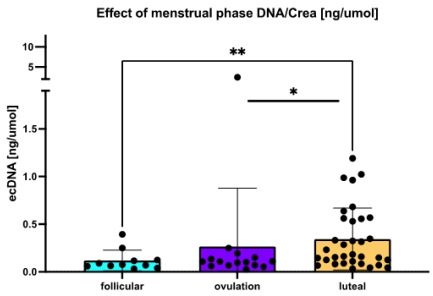
What is new?

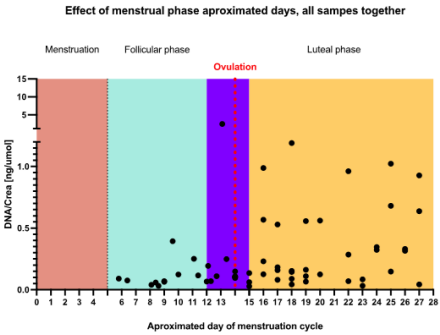
- Women have higher concentrations of urinary ecDNA and higher variability intra- and interindividual. The variability partially correlates with the menstruation cycle and is highest during the luteal phase.
- The concentration of urinary ecDNA correlates with the osmolality and DNase activity but not with the creatinine.











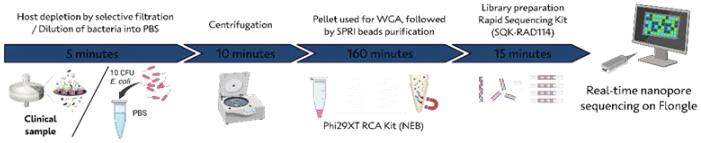
SELECTIVE CENTRIFUGATION FOLLOWED BY 16S SEQUENCING CAN IDENTIFY LOW CONCENTRATIONS OF BACTERIA IN THE BLOOD

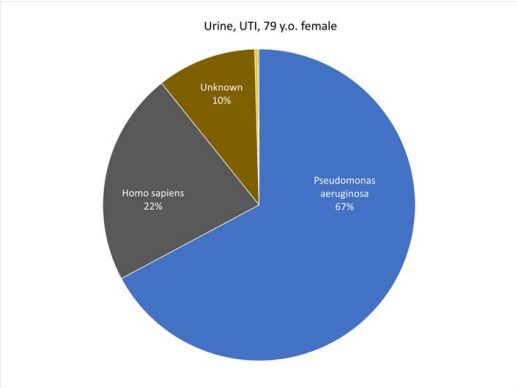
What is known?

- Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection. Of all global deaths, 20% are related to sepsis. Nowadays, the gold standard diagnostic method is haemocultivation followed by antibiotic susceptibility testing.

What is new?

- In our research, we have been developing a rapid and cost-effective method for isolating bacteria directly from artificially spiked blood samples (in vitro model of sepsis) for further use with nanopore sequencing.
- Developed a direct-from-sample method for identification of etiological agents using selective host depletion, whole genome amplification, and shotgun nanopore sequencing to identify pathogens in clinical samples from as low as 10 CFU.
- Analyzed a dozen clinical samples (urine, sputum, cerebrospinal fluid) and compared results to standard cultivation methods.





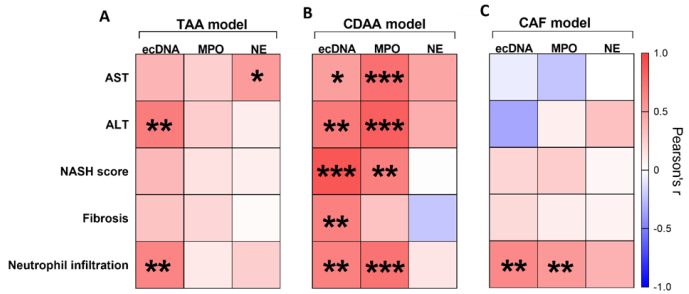
THE ROLE OF NEUTROPHIL EXTRACELLULAR TRAPS IN ANIMAL MODELS OF LIVER INJURY

What is known?

- Metabolic dysfunction-associated steatotic liver disease (MASLD) is the most common chronic liver condition worldwide. It may progress into metabolic dysfunction-associated steatohepatitis (MASH), and fibrosis.
- There is limited understanding of the pathogenesis and no established treatment therapies for MASH. Increased neutrophil extracellular trap (NETs) formation and immunogenic properties of extracellular DNA (ecDNA) could play a role.
- The main aim of this study was to investigate the dynamics of circulating ecDNA and peripheral NETs formation as potential predictors of liver injury and possible therapeutic targets. Three different animal models were used: hepatotoxic substance thioacetamide (TAA) i.p., choline-deficient L-amino acid-defined (CDAA) diet, and cafeteria model (CAF).

What is new?

- Despite no changes in the peripheral NETs formation over time, we observed an increase in ecDNA concentrations in the TAA and CDAA models and the correlation of ecDNA with at least one marker of liver damage in all three models. The marker of the NETs formation, namely MPO, highly correlated with the markers of liver damage in the CDAA model, while not in the TAA and CAF models. Based on the results, we hypothesize that the formation of NETs could be involved in CDAA-induced liver pathology.



IMBM Summer School of Biomedicine

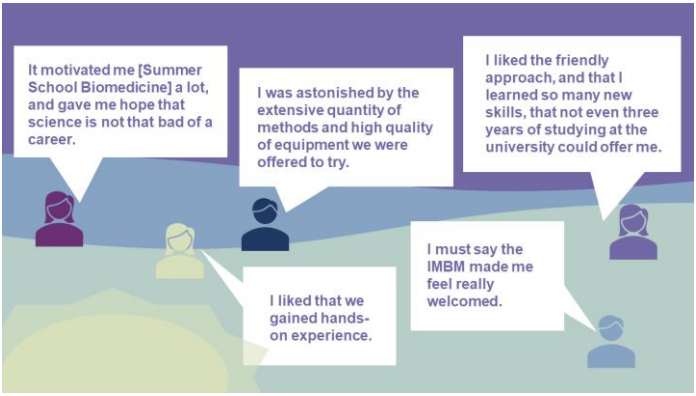
In 2024, within the IMBM Summer School of Biomedicine, 14 students obtained the opportunity to learn basic laboratory methods necessary for their future scientific careers in laboratories of IMBM at the Faculty of Medicine and Slovak Academy of Sciences in Bratislava. As students have less opportunity to learn methods of biomedical research through practical courses during their university or high school studies, the importance of summer schools has grown throughout the years.

By participating in our ongoing projects, students mastered both theoretical and practical skills of biomedical research. They learned how to search and read scientific publications in databases, work with citation managers, plan and execute experiments, perform statistical analyses, and interpret data obtained during the IMBM Summer School of Biomedicine. On the last day of the summer school, students presented their results at an internal meeting of IMBM, followed by discussions on the given topic, further improving their presentation skills.

We assume that participation in the IMBM Summer School of Biomedicine enhanced students' overall preparedness to successfully complete their high school and university studies, thereby enhancing their employability in biomedical research.

We gained the interest of Slovak students studying not only in Slovakia but also abroad in various natural sciences and medical fields of study, thus, we are working on the reintegration of Slovak students studying abroad into biomedical research at Slovak scientific institutions and, therefore, on the popularization of science and research in Slovakia as well.

Feedback from students
on IMBM Summer School of Biomedicine 2024



Tutors with students
of IMBM Summer School of Biomedicine 2024



We are happy about the student's interest in spending part of the summer with scientific research at IMBM!

Thank you, and we look forward to next year!

Conferences 2024

99th PHYSIOLOGICAL DAYS
7-8/2/2024, Bratislava, Slovak Republic
(Jakub Szabó, Katarína Šebeková, Letícia Hudecová, Michal Pastorek, Letícia Hudecová, Paulína Belvončíková, Nikola Tóthová, Petronela Sušienková, Kristína Macáková, Monika Janíková, Ľubica Janovičová, Barbora Gromová, Karolína Gubišová, Tomáš Strečanský)

12th INTERNATIONAL MEETING STEROIDS AND NERVOUS SYSTEM
24-27/2/2024, Torino, Italy
(Petronela Sušienková)

6th CENTRAL - EASTERN EUROPEAN CONGRESS ON CELL FREE DNA AND MEDICAL PRACTICE
7-8/2/2024, Olomouc, Czech Republic
(Michal Pastorek, Paulína Belvončíková, Kristína Macáková, Katarína Šebeková, Ľubica Janovičová)

GENETIC CONFERENCE IN MARTIN
14-15/3/2024, Martin, Slovakia
(Peter Celec)

EUROPEAN PHAGOCYTE WORKSHOP
20-23/3/2024, Visegrád, Hungary
(Letícia Hudecová)

19th RECOOP BRIDGES IN LIFE SCIENCES CONFERENCE
11-12/4/2024, Bratislava, Slovak Republic
(Jakub Szabó, Letícia Hudecová, Kristína Lichá, Gubišová Karolína)

62ND FACULTY CONFERENCE OF STUDENT SCIENTIFIC PROFESSIONAL ACTIVITIES
25/4/2024, Bratislava, Slovakia
(Anna Farkašová, Tetiana Pidlypska)

19TH SCIENTIFIC CONFERENCE OF PHD STUDENTS
25/4/2024, Bratislava, Slovakia
(Tomáš Strečanský, Letícia Hudecová,
Kristína Lichá, Kristína Macáková, Petronela Sušienková, Nikola Tóthová)

MEASURING BEHAVIOR 2024: 13TH INTERNATIONAL CONFERENCE ON METHODS AND TECHNIQUES IN BEHAVIOURAL RESEARCH
15-17/5/2024, Aberdeen, Scotland
(Veronika Borbélyová)

2nd BIOMEDICINE AND HEALTH PHD STUDENTS CONGRESS "SCIENCE AND US"
16-18/5/2024, Rijeka, Croatia
(Letícia Hudecová)

51th MAY HEPATOLOGICAL DAYS
22-24/5/2024, Strbske Pleso, Slovak Republic
(Jakub Szabó)

ANNUAL EUROPEAN CONGRESS OF RHEUMATOLOGY (EULAR)
12-15/6/2024, Vienna, Austria
(Kristína Macáková)

I. SLOVAK CONFERENCE ON MEDICAL EDUCATION AND SIMULATIONS (SIMEDICA)
5/9/2024, Bratislava, Slovakia
(Roman Gardlík)

15th INTERNATIONAL MAILLARD REACTION SOCIETY (IMARS)
16-19/9/2024, Maastricht, Holandsko
(Katarína Šebeková, Andrej Feješ)

INTERNATIONAL SYMPOSIUM NEUTROPHIL 2024
17-19/9/2024, Munich, Germany
(Letícia Hudecová, Emil Bečka)

XXVI. CONGRESS OF THE SLOVAK MEDICAL SOCIETY
23/9/2024, Bratislava, Slovak Republic
(Peter Celec)

COST ACTION TEATIME YOUNG RESEARCHERS WORKSHOP
23-24/9/2024, Tartu, Estonia
(Veronika Borbélyová, Jakub Szabó, Petronela Sušienková, Andrej Feješ)

XXXIV. IZAKOVIC MEMORIAL 2024
9-11/9/2024, Stara Lesna, Slovak Republic
(Barbora Vlková, Peter Celec)

WORKING CONFERENCE OF THE CHILDREN'S CLINIC OF THE FACULTY OF MEDICINE, COMENIUS UNIVERSITY AND THE NATIONAL INSTITUTE OF PEDIATRICS
10-11/9/2024, Tatranska Lomnica, Slovak Republic
(Michal Pastorek)

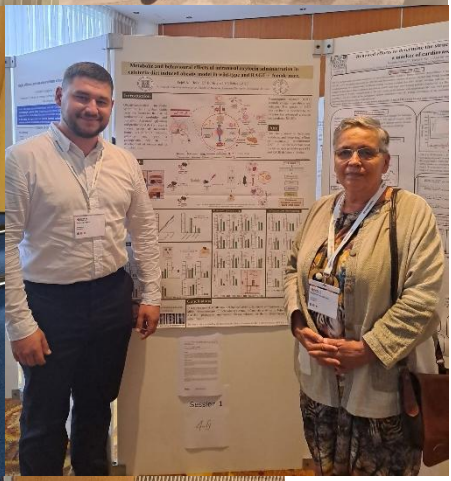
6th CONGRESS OF THE SLOVAK OBESITY ASSOCIATION AND 22nd OBESITY DAYS WITH INTERNATIONAL PARTICIPATION
25-26/10/2024, Trencin, Slovak Republic
(Andrej Feješ)

9th INTERNATIONAL CONFERENCE IN CLINICAL METAGENOMICS
7-8/11/2024, Geneva
(Tomáš Strečanský)


45. kongres Slovenskej
nefrologickej spoločnosti








7. – 8. FEBRUÁR 2024

Research stays abroad:

PAULÍNA BELVONČÍKOVÁ - Institute for Integrative Systems Biology (I2SysBio), University of Valencia, Valencia, Spain, March 2024 - June 2024, working on bioinformatic shotgun data analysis of fecal microbiota transplantation samples

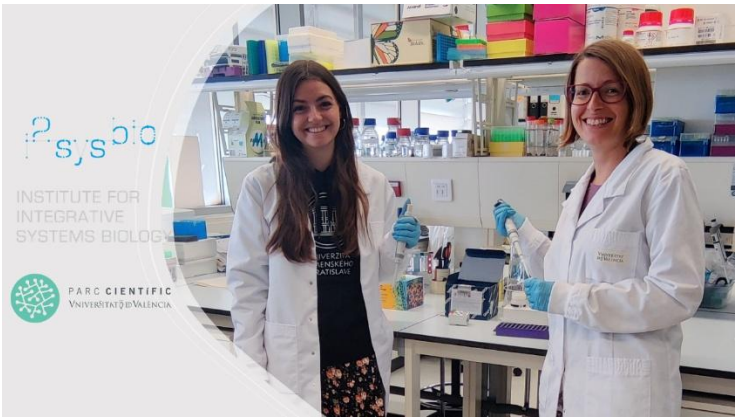
KRISTÍNA LICHÁ - Universitätsklinikum, Essen, Germany, Department of Pediatrics III, March 2023 - March 2024, working on the function of exosomes and extracellular vesicles within the diagnosis and therapy of cancer

EMIL BEČKA - Life Sciences Institute, University of Michigan, Ann Arbor, MI, USA, October 2023 - July 2024, working on specifying secreted exosome-associated DNA during neutrophil migration.

MICHAL PASTOREK- Beth Israel Deaconess Medical Center/ Harvard Medical School Boston, MA, USA, Department of Surgery, working in laboratory of Dr Barbrara Wegiel.

ANDREJ FEJEŠ - Institute of Neuroscience and Physiology, Gothenburg University, Gothenburg, Sweden, September 2023- June 2024, focusing on the neurons involved in the action of anti-obesity drug semaglutide in body weight reduction.


Beth Israel Deaconess
Medical Center
HARVARD
MEDICAL SCHOOL


INSTITUTE FOR
INTEGRATIVE
SYSTEMS BIOLOGY
PARC CIENTIFIC
UNIVERSITAT DE VALÈNCIA

Teaching at IMBM

IMBM is a research institute, but it is also important to participate in the educational process. Beyond institutional meetings, seminars and courses we prepared the lectures, seminars and practical courses at the Faculty of Medicine and Faculty of Natural Sciences, Comenius University in Bratislava:

FACULTY OF MEDICINE:

Physiology

Pathophysiology

Introduction to Science

FACULTY OF NATURAL SCIENCES:

Molecular Endocrinology

Basics of Theoretical and Experimental Medicine

Behavioral Genetics

Special Genetics

FACULTY OF MATHEMATICS AND PHYSICS

Laboratory Methods in Biomedicine

New associate professor and professor at IMBM

Assoc. prof. Michal Pastorek PhD.

We heartily congratulate our colleague doctor Michal Pastorek on the successful defence of his habilitation thesis and obtained the title of Associate Professor.

The topic of the habilitation lecture: “Neutrophil extracellular traps in the etiology of autoimmune diseases”.

The topic of the habilitation thesis: “Neutrophil extracellular traps in health and disease”.





Prof. Peter Celec MD, Dipl Ing., Dr. Rer. Nat., DSc., MPH

We heartily congratulate prof. Peter Celec who gave the inaugural lecture on “Pathophysiological aspects of extracellular DNA” at Charles University and obtained the title of Professor.





Prizes

BARBORA GROMOVÁ - 2nd place in the poster section at the 99th Physiological Days, Bratislava, Slovakia, February 7-8, 2024

ANNA FARKAŠOVÁ - 1st place in preclinical section at 62nd Faculty Conference of Student Scientific Professional Activities, Bratislava, Slovakia, April 25, 2024

TOMÁŠ STREČANSKÝ - 1st place in the preclinical section in clinical section at 19th Scientific Conference of PhD Students, Bratislava, Slovakia, April 25, 2024

NIKOLA TÓTHOVÁ - 1st place in the preclinical section in molecular-clinical section at 19th Scientific Conference of PhD Students, Bratislava, Slovakia, April 25, 2024

KRISTÍNA MACÁKOVÁ - 1st place in the preclinical section in molecular-experimental section at 19th Scientific Conference of PhD Students, Bratislava, Slovakia, April 25, 2024

LETÍCIA HUDECOVÁ - 2st place in the preclinical section in molecular-experimental section at 19th Scientific Conference of PhD Students, Bratislava, Slovakia, April 25, 2024

LETÍCIA HUDECOVÁ - award for the best oral presentation of scientific work at the 2nd Annual Doctoral Congress of Biomedicine and Health Sciences, Rijeka, Croatia, May 16-18, 2024

KAROLÍNA GUBIŠOVÁ - award for the best diploma in the academic year 2023/2024, Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava, May, 2024

KATARÍNA ŠEBEKOVÁ - prestigious award for the best publication of the past year, at the 45th Congress of the Slovak Nephrology Society with International Participation, Bratislava, Slovakia, November 6-8, 2024

PETER BIELIK - 2nd place at DREAM BIG: Power of XLEAP workshop, GeneTiCA Group, Bratislava, Slovakia, December 12, 2024

JAKUB SZABÓ - awarded the Doctor Ludmila Sedlárová-Rabanova Award for outstanding publication in biological sciences, Bratislava, Slovakia - (Intranasal oxytocin in a genetic animal model of autism)

LETÍCIA HUDECOVÁ - scholarship for a research stay for 9 months at University Hospital Bonn, Institute of Innate Immunity, Bonn, Germany (funded by the National Scholarship Programme of Slovak Republic)



Science popularization and invited lectures

NextStep Science Conference 2024 - career and networking event focussed on meeting potential employers or organization representatives from the field of natural sciences (20/03/2024)

Kristína Macáková - talked about her scientific work in a series of interviews with Slovak scientists during the NextStep Science Conference 2024

Veronika Borbélyová - talked about her scientific work in a series of interviews with Slovak scientists during the NextStep Science Conference 2024

European Science Night - lecture of associate professor **Michal Pastorek** – Caught in the Net: The Hidden Battle with Sepsis; workshop – Secrets of Scientific Research (27/9/2024)

Peter Boor – Rozhovory MD - an interesting interview about his career and the science in medicine (online podcast)

Peter Celec - among the 75 most important medical personalities in Slovakia according to Forbes magazine

Michal Pastorek - BEATsepis Consortium

Peter Celec - Radio Show – Nočná pyramída - an interview about his career and science

Michal Pastorek - lecture as part of the immunology series of seminars called Immunology Think Tank Beth Israel Deaconess Medical Center in Boston

Falling Walls Lab Slovakia 2024 - finalists **Alena Potočárová, Kristína Lichá, Emil Bečka**

Michal Pastorek - World Sepsis Day and a BEATSEPSIS working group meeting in Brno (13/9/2024)

Peter Celec - Aréna & Hoaxy, a Podvody - discussed misinformation and hoaxes in the healthcare sector and the people who spread them (online podcast)

Kristína Macáková - Challenger Science 2024 - the finalist who presented the concept of developing new biological markers for the early diagnosis of rheumatoid arthritis



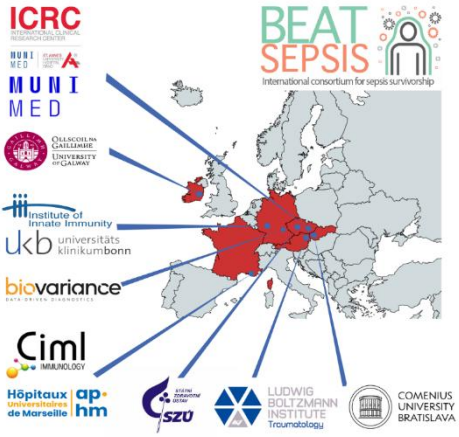


Grants

HORIZON EUROPE GRANT

HORIZON EUROPE FOR BEATSEP CONSORTIUM TO RESEARCH THE LONG-TERM CONSEQUENCES OF SEPSIS
Michal Pastorek
2023-2028

www.beatsepsis.eu



APVV GRANTS

APVV-21-0378
THE ROLE OF INFECTIOUS AND STERILE INDUCERS OF NEUTROPHIL EXTRACELLULAR TRAP FORMATION IN SEPSIS
Michal Pastorek
2022-2025

APVV-21-0370
THE ROLE OF EXTRACELLULAR DNA AND NEUTROPHIL EXTRACELLULAR TRAPS IN THE PATHOGENESIS OF CHRONIC LIVER DISEASES
Roman Gardlík
2022-2025

APVV-21-0355
CAFETERIA DIET-INDUCED OBESITY IN WILD-TYPE AND RECEPTOR FOR ADVANCED GLYCATION END PRODUCTS (RAGE-/-) KNOCKOUT MICE AND THE EFFECTS OF PERIPHERALLY ADMINISTERED OXYTOCIN
Katarína Šebeková
2022-2025

APVV-22-0554 DEOXYRIBONUCLEASE 1L3 IN THE BIOLOGY OF EXTRACELLULAR DNA
Peter Celec
2023-2027

APVV-20-0472 RAPID IDENTIFICATION OF PATHOGENS IN SEPSIS PATIENTS USING THIRD-GENERATION NANOPORE REAL-TIME SEQUENCING
Július Hodosy
2021-2024

VEGA GRANTS

VEGA 1/0212/22
THE ROLE OF EXTRACELLULAR DNA AND NEUTROPHIL TRACTS IN URINARY TRACT INFECTIONS
Ľubomíra Tóthová
2022-2024

VEGA 1/0341/23 THE ROLE OF NEUTROPHIL EXTRACELLULAR TRAPS IN THE PATHOGENESIS OF METABOLIC SYNDROME
Veronika Borbélyová
2023-2025

VEGA 1/0496/24 IMPACT OF ANTIBIOTICS ON MITOCHONDRIAL HEALTH AND NEUTROPHIL FUNCTION
Michal Pastorek
2024-2027

VEGA 1/0727/24 STERILE INFLAMMATION AT BIRTH, EXTRACELLULAR MITOCHONDRIA AND THE RISK OF POSTPARTUM INFECTION
Barbora Vlková
2024-2026

KEGA GRANTS

KEGA 071UK-4/2022
INNOVATION OF PRACTICAL BIOMEDICAL RESEARCH COURSES FOR DOCTORAL STUDENTS
Peter Celec
2022-2024

COMENIUS UNIVERSITY GRANTS

UK/1091/2024 THE INFLUENCE OF ENDOCRINE FACTORS ON THE BEHAVIOR OF FEMALE MICE WITH A GENETIC PREDISPOSITION TO AUTISM SPECTRUM DISORDERS
Petronela Sušienková
2024

UK/3253/2024 OPTIMIZATION OF PATHOGEN DNA ENRICHMENT FROM ARTIFICIALLY INFECTED BLOOD SAMPLES FOR RAPID PATHOGEN DIAGNOSIS USING WHOLE-GENOME NANOPORE SEQUENCING
Tomáš Strečanský
2024

UK/1112/2024 EXTRACELLULAR DNA IN THE PATHOGENESIS OF RHEUMATOID ARTHRITIS
Kristína Macáková
2024

UK/3263/2024 EXTRACELLULAR VESICLES AS A PROGNOSTIC MARKER OF SEPSIS
Kristína Lichá
2024

UK/1149/2024 THE ROLE OF TLR4 AND TLR9 RECEPTORS IN THE POLYMICROBIAL MODEL OF SEPSIS
Monika Janíková
2024

UK/3140/2024 INFLUENCE OF COMPOSITION OF NEUTROPHIL EXTRACELLULAR TRAPS ON THEIR REMOVAL AND IMMUNOGENICITY
Letícia Hudecová
2024

UK/1129/2024 MODULATION OF TH17 CELL IMMUNITY BY ARYL HYDROCARBON REPRESSOR SILENCING IN AUTOIMMUNE HEPATITIS
Barbora Gromová
2024

UK/1084/2024 EFFECT OF SEMAGLUTIDE AS A NEW POTENTIAL TREATMENT FOR OBESITY ON THE BEHAVIOR OF LABORATORY MICE
Andrej Feješ
2024

UK/3228/2024 THE ROLE OF NEUTROPHIL EXTRACELLULAR TRAPS IN ANIMAL MODELS OF LIVER INJURY
Paulína Belvončíková
2024

WHERE TO FIND US?

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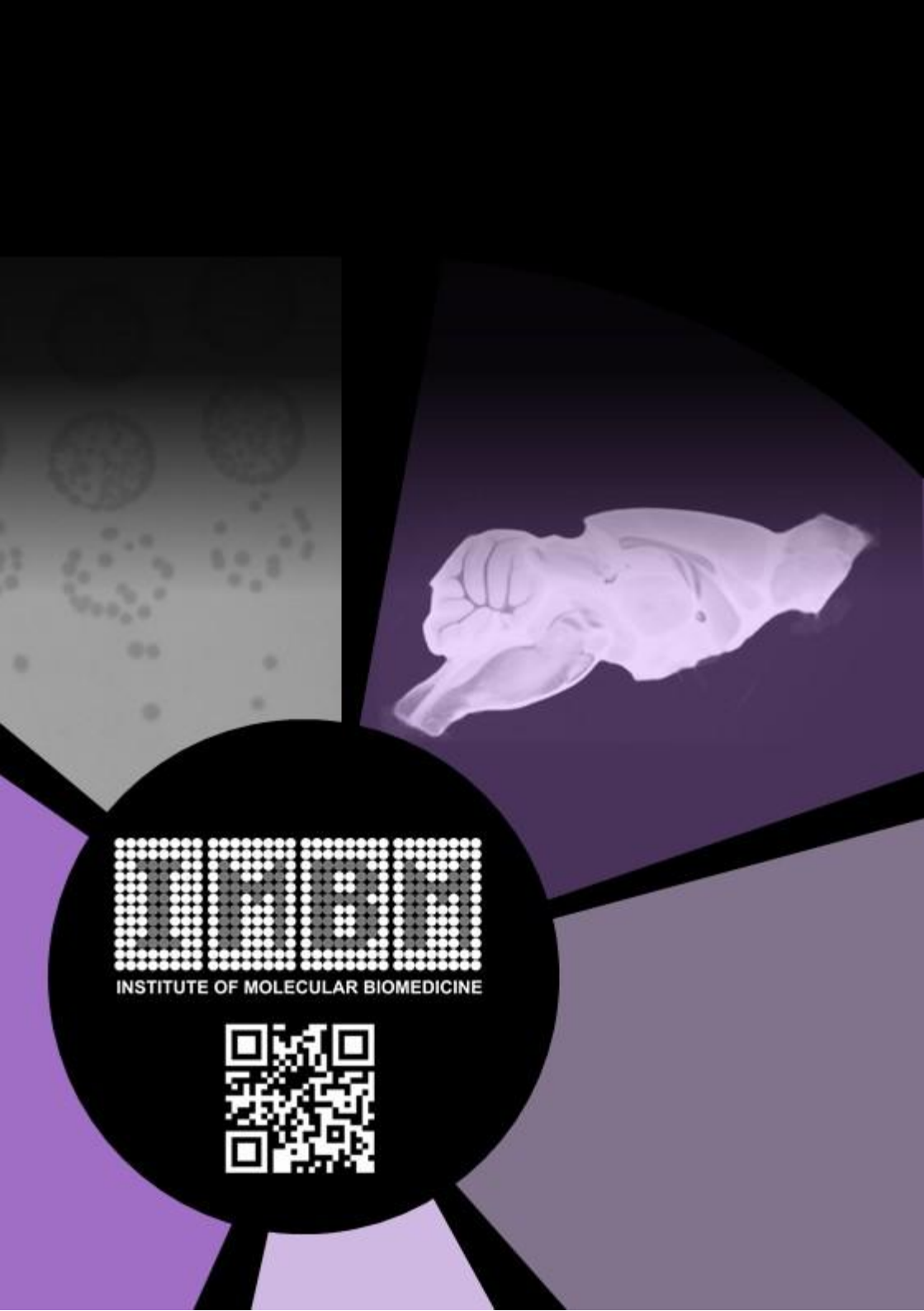
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INSTITUTE OF MOLECULAR BIOMEDICINE