



**5th Annual Conference**  
**05 March 2020**



# BIOSPOT 2020 PROGRAM

09:30 - 10:00

## Registration

10:00 – 10:10

Opening speech - Martin Fusek (IOCB TECH, CZ)

10:10 – 11:20

## BEST PRACTICES IN BIOTECH START-UP INVESTMENTS: GLOBAL PERSPECTIVE

10:10 – 10:30

**Drug repurposing of fenretinide from academia to clinics: Canadian experience**

Radu Pislariu (Laurent Pharmaceuticals, Canada)

10:30 – 10:50

**Life sciences investments in Western Europe: Opportunities and challenges in Central Europe**

Marc Lohrmann (Vesalius Biocapital, Germany)

10:50 – 11:10

**Bridging the gap: Introducing European biotech to the US investors**

Marc Pentopoulos (Vista Point Capital LLC, USA)

11:10 – 12:05

## ORAL PRESENTATIONS - SECTION I

*Chair: Julie Proft (IOCB TECH, CZ)*

11:10 – 11:25

BIOREACTOR (TU Košice, SK)

11:25 – 11:40

Radiolabelled siderophores for infection imaging (IMTM, CZ)

11:40 – 11:55

Nano-particles comprising dithiocarbamate-metal complex and a polymeric ligand for medical applications (IMTM, CZ)

11:55 – 12:10

Tacrine derivatives as a potent and selective GLU2b antagonist for treatment of neuropsychiatric diseases II (FNHK, NUDZ, CZ)

12:10 – 12:25

Small proteins mimicking epitope of HIV-1 virus neutralizing antibody for induction of virus-neutralizing antibodies (UPOL, IBT, CZ)

12:30 – 13:30

## Networking lunch and poster presentations

13:30 – 14:45

## ORAL PRESENTATIONS – SECTION II

*Chair: Michal Votruba (RSJ, CZ/USA)*

13:30 – 13:45

MEPIOR: Module for electrophysiology processing in online regime (ICRC, FNUSA, CZ)

13:45 – 14:00

SilverBeats by ArgeCure (RCPTM, CZ)

14:00 – 14:15

PickMol technology (SaftraPhotonics, SK)

14:15 – 14:30

ClinData for data stewardship (IMTM, CZ)

14:30 – 14:45

Novel purine nucleoside phosphorylase inhibitors for treatment of T-cell leukemias (IOCB, CEITEC, CZ)

14:45 – 15:45

## OPPORTUNITIES AND CHALLENGES IN BIOTECH START-UPS: PANEL DISCUSSION

*Chair: Marian Hajduch (IMTM, CZ)*

Radu Pislariu (Laurent Pharmaceuticals, Canada)

Marc Lohrmann (Vesalius Biocapital, Germany)

Marc Pentopoulos (Vista Point Capital LLC, USA)

Michal Votruba (RSJ, CZ/USA)

Martin Fusek (IOCB TTO, CZ)

Martin Bunčák (TAČR, CZ)

15:45 – 16:00

## DISCUSSION, SLI.DO POLLING & CLOSING REMARKS

*Marian Hajduch (IMTM, CZ)*

16:00 – 17:00

## Banquet, networking, B2B meetings

## POSTER SECTION

- EpilIntestinal – a reconstructed human tissue model for simulating drug kinetics and toxicity in small intestine (MatTek IVLSL, SK)
- Complex technology for testing selectivity of new potential drugs against individual isoforms of human adenylyl cyclases (ICRC, FNUSA, CZ)
- High voltage AC power supply for electroporation purposes in treatment of cardiac arrhythmia (ICRC, FNUSA, CZ)
- Telemetric system for pathophysiological stress evaluation (UPOL, CZ)
- MARESUS – negative per-oral contrast agent for magnetic resonance imaging (RCPTM, CZ)
- Portable ultrasonic device with integrated expert functions (TTO Up to Future, UA)
- UVA/UVB radiation and oxidative stress protective cytokinin derivatives for cosmetics (CRH, CZ)
- Inhibitors of anopheles gambiae acetylcholinesterase as insecticides (FNHK, CZ)
- Adaptation of implant's surface to recipients's body (MABELA Ltd., UA)
- Entrant (MU Brno, CZ)
- Microblot-Array (TestLine Clinical Diagnostics, CZ)
- Novel hybrid lincosamide antibiotics (BIOMED.CAS, CZ)



## SPEAKERS AND PANELISTS



### Radu Pislariu

Radu is an experienced healthcare entrepreneur and investor, with extensive medical and drug development expertise. Previously with iNovia Capital and MSBi Valorisation, he was involved in creating and structuring several university spin-offs, as well as leveraging pre-seed, seed and early stage financing rounds, which collectively raised more than \$150 million from private and public sources.

Radu received his M.D. from „Gr.T.Popa“ University of Medicine and Pharmacy (Iasi, Romania), and also holds a graduate diploma in Drug Development from the University of Montreal and a graduate diploma in Management from Hautes Etudes Commerciales (HEC) in Montreal.



### Marc Pentopoulos

Marc has over 20 years of experience investing in health care companies as well as working with small life sciences companies to help them develop their products, create pharmaceutical development and licensing partnerships, and finance their businesses.

Currently, he works as a managing partner at Vista Point Capital, an investment firm with strategy and business development consulting capabilities, focused on the healthcare sector. In this role he has success as an investor and has helped to secure investment capital, licenses, and partnerships for small life science companies – also those with European ancestry.



### Marc Lohrmann

Having close to 15 years of experience in the life sciences sector, Marc himself has cofounded several medtech/biotech companies, gaining ample experience in work with venture capital.

As of 2012, he started to work as a venture partner with Vesalius Biocapital - a VC firm currently investing in later-stage European life sciences companies across drug development, medtech, diagnostics and digital health, providing capital to support their development.



### Martin Fusek

Martin works as a Vice-director for Strategic Development at IOCB Prague and a CEO of its subsidiary company for tech transfer, IOCB Tech. His experience is a combination of basic research work both in the Czech Republic and abroad, long-term commercial activities for global companies, and first-hand experience in establishing spin-off companies, intellectual property protection and organization of the technology transfer process on specific projects.

In 2017, he co-founded a company i&i Prague with the aim of representing the institute in all spin-offs arising from IOCB but also to scout for projects with innovative potential outside IOCB.



### Marian Hajduch

Scientist and medical professional mainly involved in molecular and translational medicine (disease area oncology and infectious diseases); long-term experience in project management; R&D and technology transfer activities, including the construction and management of large research infrastructures. Founding director of the Institute of Molecular and Translational Medicine, Palacky University in Olomouc, CZ.

He has been involved as principal investigator, investigator or clinical site manager in 19 clinical trials; actively participated in the research and/or management of >50 national and international projects; established Cancer Research Czech Republic as a major charity to support cancer research in CZ; spin-off companies focused on manufacturing of molecular diagnostics, bioinformatics and drug development; leader/co-leader drug development initiatives with one registered drug on market, several products in clinical trials, >30 in vitro diagnostic products on market, several CE IVD certified. Former Chair of the Boards of National Director and current Czech National Director for European Translational Medicine Infrastructure (EATRIS-ERIC); participated in creation of national network for personalized medicine and cancer management policies. Published more than >350 papers, 17 books/chapters, >40 patents, >4900 SCI citations, H-index 36.



### Martin Bunčák

Born April 7th, 1975 in Rakovník. Graduated from University of Pardubice, Faculty of Chemical Technology. Completed postgraduate studies at the Pharmaceutical Faculty of Charles University in Hradec Králové and work stay at IMM in Oxford and TUE in Eindhoven. He worked for GENERI BIOTECH s.r.o. almost since its foundation, gradually went through all the positions and participated in the conception of the company as a whole, especially in research and development. He held the managerial position of R&D Director at GENERI BIOTECH Ltd. And ISO 9001:2008 quality manager. Principal investigator or co-worker of national and international (FP6, FP7 EU) projects. He is dealing with external teaching: till 02/2014 as an assistant professor at the University of Pardubice, Faculty of Chemical Technology, lectures molecular biology and genetics and molecular biological methods, at Charles University, Faculty of Pharmacy in Hradec Králové in the gene therapy. Gained experience not only in the protection of R&D results (patents, etc.), application of R&D results in practice, but also purchasing and use of know-how, including the due-diligence.

In GENERI BIOTECH Ltd. successfully led negotiations on the purchase of a license from the Masaryk University in Brno, under which a unique diagnostic kit for determining the prognosis of chronic lymphocytic leukemia was developed and is marketed. He actively participated in the initiation and initial development of the association of Czech biotech companies CzechBio. He is the author or co-author of scientific publication and patents. At this time, he is an independent expert in Eurostars! programme and provides lectures. He has worked for Technology Agency of Czech republic since its foundation in 2009 as a member of the board and vice-chairman. Since 2018 he has been managing director of Technology Agency of Czech republic.



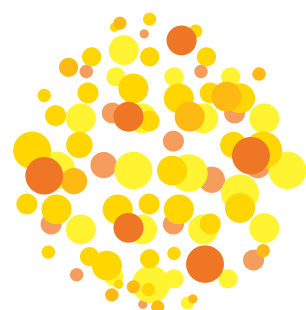
### Michal Votruba

Michal is the director of RSJ Gradus, which is RSJ Investments' fund that focuses on healthcare and medicine in the US and Europe. Its investments target research and development into medicines for serious illnesses as well as the effective production of new drugs or the operation of healthcare systems.

Michal studied medicine at Charles University, specializing psychiatry and worked as a consultant in the pharmaceutical industry for over 10 years.



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TRANSLATIONAL MEDICINE



IOCB Tech



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and Innovations for Competitiveness

UNDER THE AUSPICES OF THE TECHNOLOGY AGENCY OF THE CZECH REPUBLIC



# ORAL PRESENTATIONS SECTION I

*Chair: Julie Proft (IOCB TECH, CZ)*





# THE TECHNOLOGY OF TOMORROW

## THE MEDCHEMBIO PROVIDES

- validation of analytical method by HPLC
- forced degradation study of sample/solution of analyte
- analysis on IR spektrofotometer
- potentiometric titration
- measuring of pH/conductivity
- other common laboratory tests



**MedChemBio**

Cluster of Medicinal Chemistry and Chemical Biology

**MedChemBio**  
Science and Technology Park  
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## BIOREACTOR

### INTRODUCTION:

Stem cell proliferation and 3D scaffold production is currently a trend in tissue engineering, regenerative medicine and bioadditive applications. As cell cultivation is a very complex and specific process, equally great attention should be paid to careful analysis and new design of systems that offer a compatible platform for cell growth and create 3D tissues by providing conditions that mimic their natural microenvironment. Bioreactor development process with an emphasis on human medicine will help accelerate the entrance of bioreactor technology at clinics and manufacturing hospitals of the future. Depending on the applications and specific requirements, the bioreactor system must be designed to produce differentiated cells with uniform properties required for individual tissue structure.

### TECHNOLOGY (INVENTION) DESCRIPTION:

Using the predictive software methods, sensorics, material research and diagnostic imaging equipment, the concept will be able to design a complex feedback bioreactor system that will be capable of repetitive tissue culture in vitro under in vivo similar conditions using scaffolds made by additive manufacturing and bioprinting. Experts involved in the concept evolution are from Technical University of Košice, Associated Tissue Bank in Košice, Department of Material Sciences of Slovak Academy of Sciences and experts from clinical and industrial sector.

### ADVANTAGES OVER EXISTING SOLUTIONS:

The advantages of the concept are in innovative solutions of modularity and movement of the bioreactor units using current progressive technologies and materials for bioreactor production. The modularity of the bioreactor system is associated with biocompatibility, transparency and the possibility of recycling individual components of the bioreactor system. Based on predictive software methods and using deep learning and machine learning mechanisms, the bioreactor system will be able to optimize parameter settings based on the analysis of collected data from integrated sensors.

### DEVELOPMENT STATUS (STAGE):

At present, a digital model is prepared, which is the result of a national grant. Numerical simulations of bioreactor sy.

### PUBLICATIONS:

As part of the project, review articles were published in anthologies at Slovak and international conferences.

### IP PROTECTION STATUS:

As part of the development of the concept, it is planned to submit several utility models and patents that will be linked.

### TECHNOLOGY / IP OWNERS:

We will use commercially available systems for certain parts of a bioreactor system. Technical University, Košice.





## Radiolabelled siderophores for infection imaging

### INTRODUCTION:

Invasive fungal and bacterial infections are major causes of morbidity and mortality in immunocompromised patients. In recent years, a dramatic increase in the incidence of infections caused by opportunistic pathogens has been observed. Early diagnosis of infection and capacity to distinguish between microbial and sterile inflammation is very important to efficiently treat patients and prevent the complications of pathology. Currently a number of tests and methods are used in clinical practice. However, most of these techniques lack sufficient specificity and/or sensitivity for early and accurate detection of the pathogen. The availability of rapid and reliable diagnostic tool for infectious diseases represents a major unmet need in managing critically ill patients.

### TECHNOLOGY (INVENTION) DESCRIPTION:

Siderophores are low molecular weight iron chelators produced by bacteria, fungi and some plants. They are excreted to bind essential iron making it available for the microorganism. Iron-siderophore complexes are then recognized by highly specific receptors. Remarkably, numerous microbes possess specific uptake systems not only for native siderophores, but also for siderophores synthesized exclusively by other microorganisms. Gallium-68 is a positron emitter that has recently gained great interest for molecular imaging applications using positron emission tomography (PET). It is readily available from a 68Ge/68Ga generator and has a suitably short half-life of 68 min. In addition, Ga (III) has comparable complex chemistry to Fe (III), and binds with high affinity to siderophores.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Currently the diagnosis of infection with radiopharmaceuticals is mainly performed with 99mTc- or 111In-labelled leukocytes, 67Ga/68Ga-citrate, 99mTc-diphosphonates and 18F-FDG. However, all of these compounds lack the specificity to discriminate among different infectious pathogens and even between infectious and non-infectious inflammation. Based on our preclinical results, we believe that the detection of microbial infections with radiolabelled siderophores using PET is non-invasive, rapid, sensitive, specific, quantifiable, allows to localize the site of infection and monitor the disease progression as well as therapy response, and as such has a great potential for translation to clinic.

### DEVELOPMENT STATUS (STAGE):

Preclinical in vitro and in vivo data of various 68Ga-siderophores. Clinical trial of 68Ga-desferal in preparation.

### PUBLICATIONS:

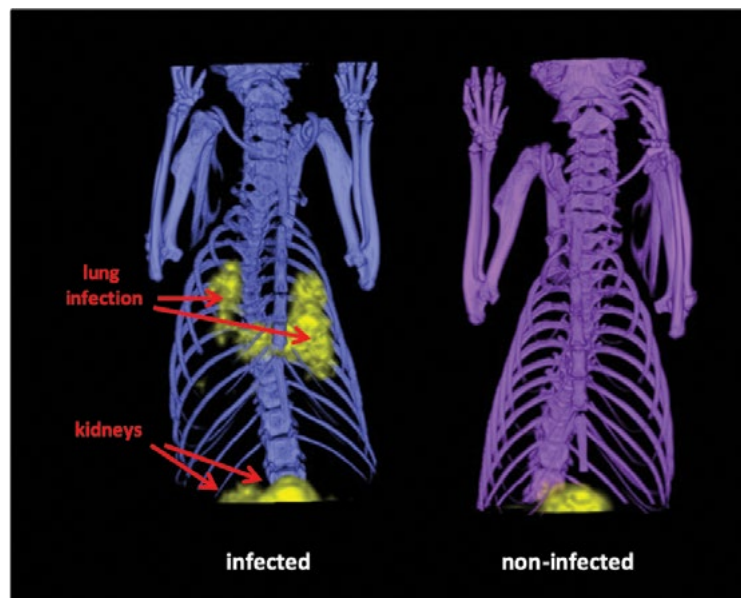
Petrik M. et al.: 68Ga-Siderophores for PET imaging of Invasive Pulmonary Aspergillosis: Proof of Principle. J. Nucl. Med. 51, 639-645 (2010) Petrik M. et al.: Preclinical evaluation of two 68Ga-siderophores as potential radiopharmaceuticals for Aspergillus fumigatus infection imaging. Eur. J. Nucl. Med. Mol. Imaging. 39, 1175-1183 (2012) Petrik M. et al.: Siderophores for molecular imaging applications. Clin. Transl. Imaging 5, 15-27 (2017) Petrik M. et al.: Imaging of Pseudomonas aeruginosa infection with Ga-68 labelled pyoverdine for positron emission tomography Sci. Rep. 8, 15698 (2018).

### IP PROTECTION STATUS:

None.

### TECHNOLOGY / IP OWNERS:

Palacky University Olomouc  
Medical University Innsbruck



## Nano-particles comprising dithiocarbamate-metal complex and a polymeric ligand for medical applications

### INTRODUCTION:

Dithiocarbamates, particularly copper complexes, display anticancer activity in cellular systems and also in-vivo. However, the complexes are not water-soluble, which makes difficult to administer them to patients. The presented technology overcome this major limitation and even provide improvement in tumor targeting and PET/SPECT tumor imaging.

### TECHNOLOGY (INVENTION) DESCRIPTION:

The presented technology brings together dithiocarbamate-metal complexes with specific ligands in the form of nano-particles. The ligands are typically water-soluble polymers used as pharmaceutical excipients. Such ligands have a low or no toxicity and are tested and registered for use in pharmaceutical formulations, such as therapeutical or diagnostic preparations and are available on an industrial scale. The nano-particles have a unique form of molecular assembly and key features, making them suitable for use as anticancer drugs or as diagnostic agents. That includes well-defined size within the nanometer scale and good stability in physiological solutions. They can also be easily sterilized and lyophilized. Importantly, the manufacturing procedure is very simple and reproducible.

### ADVANTAGES OVER EXISTING SOLUTIONS:

There is an existing technology of formulation of the dithiocarbamate metal complexes in the form of protein-based nano-particles. However, the use of proteins in the formulation involves several disadvantages, technical, hygienic, toxicology, and ethical issues as well. Immunoreactivity issues may occur, and during tests in animal models, different types of proteins need to be used. The protein ligands are prone to denaturation due to low or high pH values or due to higher temperatures, or prone to decomposition by the action of proteases. Only a few proteins are authorized for pharmaceutical use and commercial availability is rather limited by the amount and cost.

### DEVELOPMENT STATUS (STAGE):

Mastered production scalable for large-scale. Stability data. In vitro/vivo data (antitumor, pharmacokinetics, toxicity).

### PUBLICATIONS:

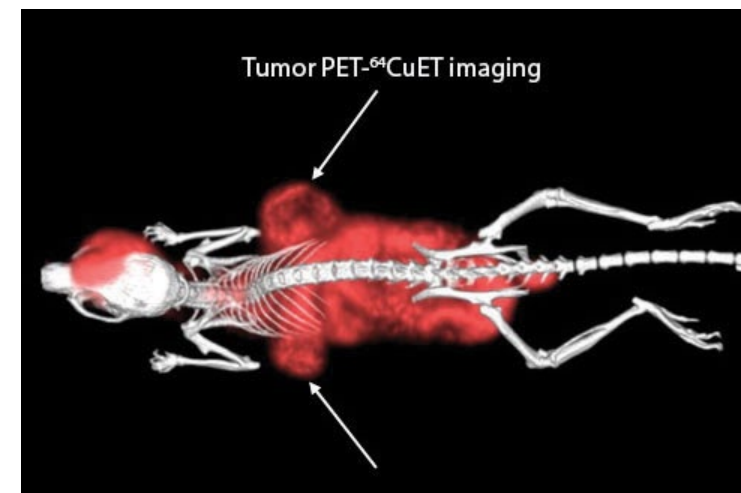
Nature. 2017 Dec 14;552(7684):194-199. doi: 10.1038/nature25016. Epub 2017 Dec 6.

### IP PROTECTION STATUS:

PCT/EP2019/077222 PCT/EP2018/076098

### TECHNOLOGY / IP OWNERS:

Palacky University, Olomouc.





## Tacrine derivatives as a potent and selective GLU2b antagonist for treatment of neuropsychiatric diseases II

### INTRODUCTION:

The continuous research in the field of Alzheimer's disease (AD) has contributed to delineate this disease as a multifactorial syndrome with several biological targets involved in its etiology. Thus the curative paradigm of one-compound one-target that has been followed so far has not reached the desired expectations.

### TECHNOLOGY (INVENTION) DESCRIPTION:

Our goal was to develop a multi-target-directed ligand (MTDL) combining the support for the cholinergic system by inhibition of acetylcholinesterase (AChE) and at the same time ameliorating the burden caused by glutamate excitotoxicity mediated by the NMDA receptors. We have developed a derivative based on tacrine scaffold, which is a potent inhibitor of acetylcholinesterase and a selective and potent inhibitor of the GluN1/GLuN2B receptors. The mechanism of binding to the GluN1/GLuN2B receptors has showed that it binds to the ifenprodil – binding site, in addition to the pore region of the GluN1/GLuN2B receptors. Together, our data shows that tacrine derivative inhibits the GluN1/ GluN2B receptors by a voltage-independent manner.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Our structures are multi-targeted hybrids based on tacrine structure scaffold. While currently used treatment consists of memantine (NMDA blocker) and AChE inhibitors, we combined both approaches in the single molecules. Our data suggests efficacy on both targets, with favourable drug-like properties (solubility, absorption, BBB permeability). The neuroprotective ability of the compounds to prevent or treat neuronal damage caused by the NMDA overstimulation was confirmed by the permanent lesion of hippocampus induced by a microinjection of NMDA. We also confirmed that the compound crosses the blood-brain barrier with the plasma brain ratio approx. 1/3.

### DEVELOPMENT STATUS (STAGE):

Preclinical, animal models.

### PUBLICATIONS:

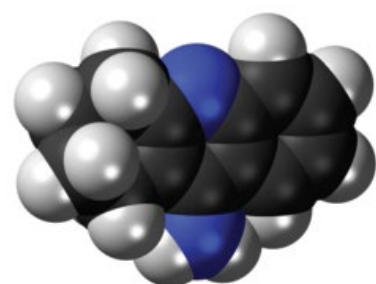
We published only previously synthesised compounds e.g.: doi: 10.1016/j.ejmech.2018.02.083 doi: 10.2174/1567205015666180711110750 doi: 10.3390/molecules22061006 doi: 10.1016/j.ejmech.2016.12.048 doi: 10.1016/j.jinorgbio.2016.05.001.

### IP PROTECTION STATUS:

No patent applications, new structures were not published.

### TECHNOLOGY / IP OWNERS :

National Institute of Mental Health, University Hospital Hradec Kralove



## Small proteins mimicking epitope of HIV-1 virus neutralizing antibody for induction of virus-neutralizing antibodies

### INTRODUCTION:

The development of an effective vaccine preventing Human Immunodeficiency Virus (HIV)-1 infection is hindered by the enormous antigenic variability and unique biochemical and immunological properties of HIV-1 Env glycoprotein, the most promising target for HIV-1 neutralizing antibody. Functional studies of rare elite neutralizers led to the discovery of broadly neutralizing antibodies which are one of crucial protecting factors preventing virus spreading.

### TECHNOLOGY (INVENTION) DESCRIPTION:

Highly complex combinatorial protein libraries were used to identify small protein binders specifically recognizing the paratope of HIV-1 broadly neutralizing antibodies identified in HIV-1 infected subjects neutralizing most of present HIV-1 virion variants. The most specific binders are applicable as immunogens eliciting Env-specific serum antibodies which neutralize various HIV-1 variants.

### ADVANTAGES OVER EXISTING SOLUTIONS:

This strategy based on the identification of protein replicas of broadly neutralizing antibody paratope represents a novel approach in HIV-1 vaccine development. This approach is not affected by low immunogenicity of neutralization-sensitive epitopes, variability, and unique biochemical properties of HIV-1 Env used as a crucial antigen in the majority of contemporary tested vaccines.

### DEVELOPMENT STATUS (STAGE):

Binders were identified and successfully tested in experimental animals.

### PUBLICATIONS:

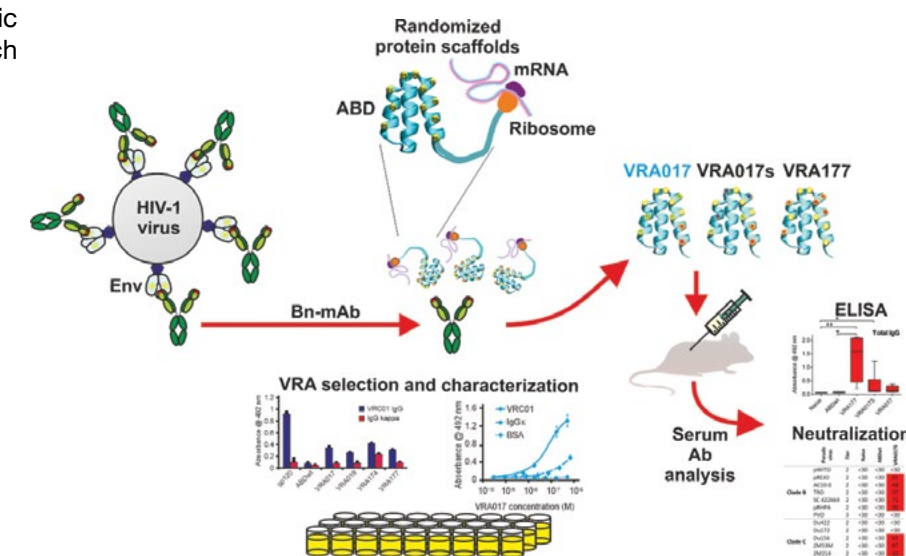
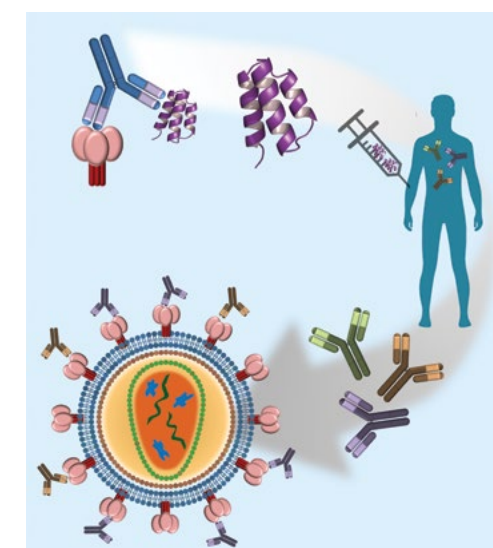
Proteins mimicking epitope of HIV-1 virus neutralizing antibody induce virus-neutralizing sera in mice. Kosztyu P, Kuchar M, Cerny J, Barkocziova L, Maly M, Petrokova H, Czernekova L, Liskova V, Raskova Kafkova L, Knotigova P, Masek J, Turanek J, Maly P, Raska M. EBioMedicine. 2019 Sep;47:247-256. doi:10.1016/j.ebiom.2019.07.015. PMID:31544770.

### IP PROTECTION STATUS:

Czech Patent application #: PV 2019-585. Submitted Sep 13th 2019.

### TECHNOLOGY / IP OWNERS :

Institute of Biotechnology, Czech Academy of Sciences, Czech Republic  
Palacky University Olomouc, Czech Republic





**Thank you  
for your  
inventions!**

# ORAL PRESENTATIONS SECTION II

*Chair: Michal Votruba (RSJ, CZ/USA)*



**CANCER RESEARCH  
CZECH REPUBLIC**

[www.vyzkumrakoviny.cz](http://www.vyzkumrakoviny.cz)





## MEPIOR: Module for Electrophysiology Processing In Online Regime

### INTRODUCTION:

Complex software for acquisition, processing and visualisation of data from intracranial EEG (electroencephalography) in real time for the purpose of precise localisation of epileptic tissue in the brain. Electroencephalography (EEG) is a method to record electrical activity of the brain. It measures voltage fluctuations resulting from ionic current within the neurons of the brain. EEG is used to diagnose epilepsy, disease which affects nearly 50 million people worldwide. It is also used to diagnose brain tumors, stroke, sleep disorders, brain damage, brain dysfunctions, inflammation of the brain, and depth of anesthesia, coma, or brain death. The software allows for more precise localisation of affected tissue in the brain and thus more effective treatment than any other method.

### TECHNOLOGY (INVENTION) DESCRIPTION:

MEPIOR is the only software in the world that allows complex processing of high-frequency intracranial EEG to identify various modern biomarkers of epileptogenic tissue in the iEEG signal (interictal discharges, high-frequency oscillations, connectivity changes, etc.). The detection of these biomarkers allows rapid localization of seizure-generating tissue and can provide physicians with information and the current state of the patient's brain. The software also allows connection to any acquisition hardware that supports sending iEEG data over a data network. Due to the modular nature of the software, it can be easily extended with new algorithms for EEG processing. In principle, the software can also be used to process other electrophysiological signals, such as ECG or EMG.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Several companies have an online interictal discharge detector. However, the developed software is the only one in the world that allows complex processing of high-frequency intracranial EEG to identify various modern biomarkers of epileptogenic tissue in the iEEG signal (interictal discharges, high-frequency oscillations, connectivity changes, etc.). The software also allows connection to any acquisition hardware that supports sending iEEG data over a data network. Due to the modular nature of the software, it can be easily extended with new algorithms for EEG processing. In principle, the software can also be used to process other electrophysiological signals, such as ECG or EMG.

### DEVELOPMENT STATUS (STAGE):

Fully developed, tested at 1st Neurillogical Department of St-. Anne's University Hospital and at Mayo Clinic in the USA.

### PUBLICATIONS:

NREM sleep is the state of vigilance that best identifies the epileptogenic zone in the interictal electroencephalogram. Klimes P, Cimbalnik J, Brazdil M, Hall J, Dubeau F, Gotman J, Frauscher B. Epilepsia. 2019 Dec; Multi-feature localization of epileptic foci from interictal, intracranial EEG. Cimbalnik J, Klimes P, Sladky V, Nejedly P, Jurak P, Pail M, Roman R, Daniel P, Guragain H, Brinkmann B, Brazdil M, Worrell G. Clin Neurophysiol. 2019 Oct; Hippocampal high frequency oscillations in unilateral and bilateral mesial temporal lobe epilepsy. Řehulka P, Cimbalník J, Pail M, Chrástina J, Hermanová M, Brázdil M. Clin Neurophysiol. 2019 Jul.

### IP PROTECTION STATUS:

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### TECHNOLOGY / IP OWNERS :

St. Anne's University Hospital in Brno.



## SilverBeats by ArgeCure

### INTRODUCTION:

Antimicrobial properties of silver have been known for centuries. It has been proved that silver is effective against various bacteria and fungi and in its insoluble zero-valent form it naturally occurs in our environment. Moreover, the bacterial resistance has not been proved yet. Silver is commonly used in jewellery industry and even in long-term contact with skin poses minimal risk for majority of population. The need for antibacterial features, natural origin, rare allergies, wide scale effects and possibly no bacteria resistance favours its use in many fields. In the field of cosmetics, this can be used for prolonging expiration of cosmetic products, saving preservatives and having positive effect in final formulation against large variety of dermatitis caused by bacteria and fungi.

### TECHNOLOGY (INVENTION) DESCRIPTION:

The invention enables a preparation of composite materials conveying positive effects of zero-valent silver with enormous surface area but not using potentially dangerous nanoparticles. Therefore, minimal amounts are needed, which results in material savings and therefore reduction of the costs although the desired effect is guaranteed. The silver, in a form of nanoparticles, is covalently bonded to micro particles, which prevents nanoparticles release to the site of application or to the environment. The invention protects the method of preparing/manufacturing the material with covalently bonded silver.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Antibacterial effects of silver can be achieved using either large quantities of metal form of silver in its macroscopic state or using relatively small amount of dangerous nanoparticles/ionic silver. Silver ions or nanoparticles pass through skin/membranes and can be accumulated in inner organs, especially in liver. The technology offers preparation and usage of a composite material, where silver nanoparticles are bonded to large and inert carrier particles and this way to profit from the safety of large and inert carrier particles, which cannot penetrate a skin barrier. It can be used as a preservative in the cosmetics or have a positive dermatic effect.

### DEVELOPMENT STATUS (STAGE):

Three-step manufacturing process; completed toxicological test (SZÚ/NHI approved).

### PUBLICATIONS:

1. Paril, P et al. Antifungal effects of copper and silver nanoparticles against white and brown-rot fungi. Journal of Material Science. 52 (2017) 2720-2729. 2. Veverkova L. et al. Accurate determination of silver nanoparticles in animal tissues by inductively coupled plasma mass spectrometry. SPECTROCHIMICA ACTA PART B-ATOMIC SPECTROSCOPY. 102 (2014) 7-11. 3. Sitt, A et al. Microscale Rockets and Picoliter Containers Engineered from Electrospun Polymeric Microtubes. SMALL. 12 (2016) 1432-1439. - technology completely described in granted patents.

### IP PROTECTION STATUS:

Granted patent CZ303502 + EP + US; Granted patent CZ201638 + EP; Future patent for the manufacturing process.

### TECHNOLOGY / IP OWNERS :

All patents are owned by Palacky University Olomouc. Licence negotiation for the composite particles commercialization started by a start-up company.

### ArgeCure® Microparticles - ACM

Antimicrobial Composite Microparticles (ACM) manufactured by using of unique approach for immobilization of silver nanoparticles onto microparticle substrates, such as natural mineral montmorillonite or synthetic polyurethane, are presented. Composite materials with silver on the surface are highly suitable as antimicrobial agents in cosmetic or veterinary products, such as eye drops, ointments or creams.

"ArgeCure® products have significant antimicrobial effect, are stable and safe since they do not penetrate cell membranes thanks to their microsize dimensions." Jana Soukupová, inventor

#### Main Benefits

- safe antimicrobial agent
- does not penetrate cell membranes
- high antimicrobial effect
- does not induce resistance of microorganism
- local, targeted effect
- strong fixation of silver on the surface
- easy to incorporate the microsize particles into a chosen ointment/cream/gel/drops
- patented technology

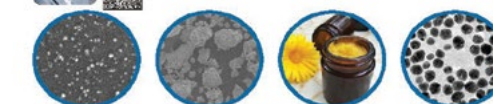
#### Technical specification

material: composite with silver nanoparticles  
substrate: montmorillonite or polyurethane  
size: from tens to hundreds of micrometers  
amount of silver: 10-70 mg / 1 g composite

#### Contact us:

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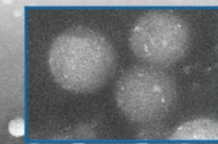


### Why to use ArgeCure®

Bulk silver has been used as an antimicrobial agent since Ancient times. Its antimicrobial activity was significantly increased with a change of its dimension from macroscopic to nanoscopic. Nevertheless, the diameter in nanometers allows these highly active particles to penetrate through different membranes/tissues and as such became potentially dangerous.

Acceptable solution to the addressed issue is patented technology ArgeCure® - composite materials on the bases of the macroscopic core with covalently immobilized active nanoparticles. Due to the nature of strong interaction between the matrix and silver, the release of the nanoparticles is prevented. ArgeCure® technology can be used for manufacturing of products with various dimensions, from microparticles and particles over microfibres and fibres up to large surfaces. The final products reveal high antimicrobial activity, strong fixation of silver nanoparticles and high durability.

ArgeCure® technology profits from typical characteristic features of both composite counterparts. The micro- or macro- sized matrices are safe not to penetrate the membranes and migrate in organisms, and the immobilized silver nanoparticles provide premium antimicrobial properties.





## PickMol technology

### INTRODUCTION:

New screening method for organic compounds based on Plasmonic Enhanced Raman scattering for application in the field of Environmental, Food, Pharma & Chem industrial analyses etc. Standardization protocol of PickMol technology is based on the verification by LCMSQTRAP & GCMS as standard validated method for PoPs analyses in water. PickMolTM technology represents a nano-optical chip (PickMol Sensing Chip), detection system (PickMol RAMASCOPE), measurement and evaluation software (PickMol sw/app) and database of pure forms of detected molecules (PickMol database).

### TECHNOLOGY (INVENTION) DESCRIPTION:

The PickMol technology is based on plasmonic-enhanced Raman scattering (PERS) and is represented by an invention/ construction of nano-optical chip. Its function is built on the principle of plasmons generation on the tailored plasmonic nano-surface for the selective capture and detection of organic molecules.

### ADVANTAGES OVER EXISTING SOLUTIONS:

The PickMol technology is screening method with sub-nanomolar (ppb) sensitivity, full green technology without sample pretreatment and use of any chemicals for detection of organic contaminants in liquids, portable system-detection on spot with instant results within 10 min, extremely cheap monitoring: the price of analysis is the price of nano-chip.

### DEVELOPMENT STATUS (STAGE):

PickMolTM technology is market ready and offers complete solution.

### PUBLICATIONS:

### IP PROTECTION STATUS:

Slovak Patent number SK127-2017, PCT patent number PCT/IB2018/060065.

### TECHNOLOGY / IP OWNERS :

prof.Pavol Miškovský, Saftra photonics s.r.o.

**PROBLEM SOLVING**

**SAFTRA Photonics Ltd.**

brings an original solution to the market



**PickMol Technology**

Is a patented (PCT/IB2018/060065) and validated solution that brings a new quality of pollution monitoring.

Targeted Analysis Technology

PickMol Selective Sensing CHIP

PickMol RAMASCOPE

PickMol Analysis APP/SW

PickMol DATABASES

## ClinData for data stewardship

### INTRODUCTION:

ClinData is a software solution for collecting of clinical and lab data on patients included in various research projects and clinical studies. ClinData features exceptional flexibility in the design of research and clinical projects, the ability to store data from several different unrelated projects in parallel and secure access.

### TECHNOLOGY (INVENTION) DESCRIPTION:

ClinData is based on client/server architecture, the application runs on a server, a user is connected through a web browser. All communication between a client and a server is secured by SSL encryption, which is currently an industry standard. The Java 8 programming language is used for the server part of the application, which allows sustainability and long-term development. The client interface uses open source technologies – HTML, Java Script, jQuery, Angular, Bootstrap.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Flexibility – ClinData can contain data from narrowly specialized scientific databases and/or from wide multi-centric clinical studies. Ease of use – definition of new projects is done via designer with wide portfolio of capabilities, no programmer support needed for standard tasks. Unique data model – data is stored in a universal data storage providing wide flexibility. Security - every user has accurately defined privileges what data he/she can see and what he/she can do with. Data can be anonymized to ensure better protection.

### DEVELOPMENT STATUS (STAGE):

Used in many clinical studies and scientific projects.

### PUBLICATIONS:

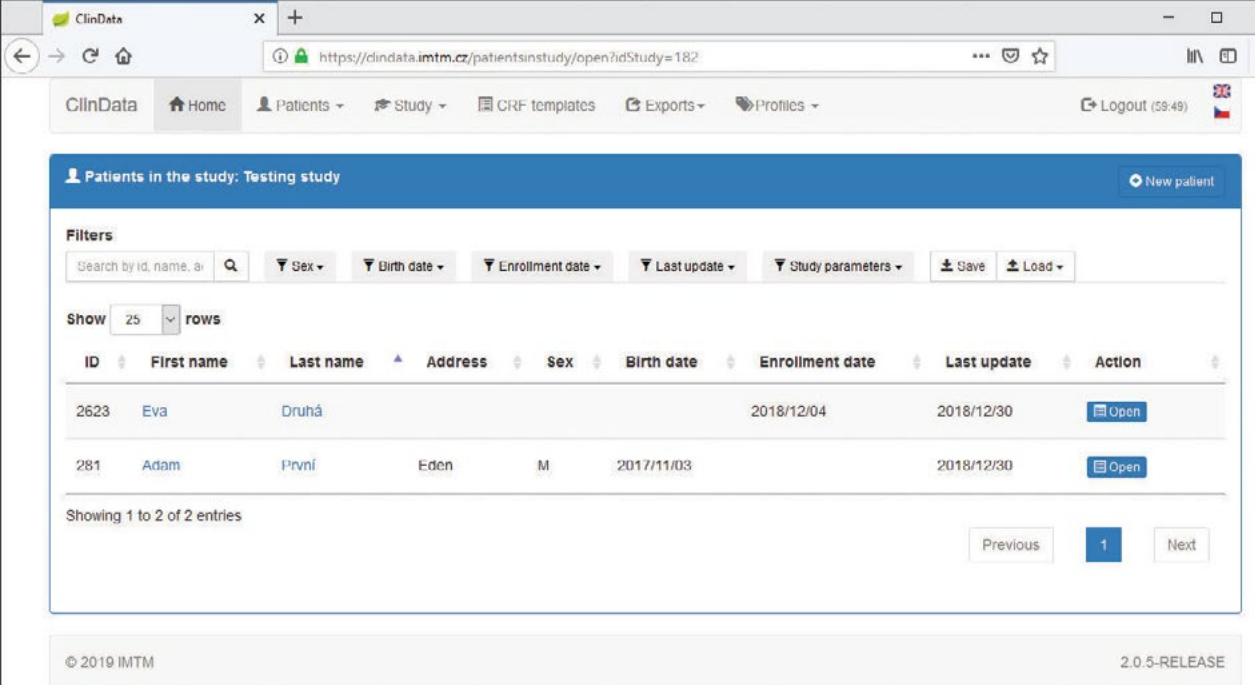
Nature. 2017 Dec 14;552(7684):194-199. doi: 10.1038/nature25016. Epub 2017 Dec 6.

### IP PROTECTION STATUS:

Protected as a know-how.

### TECHNOLOGY / IP OWNERS:

Palacky University Olomouc.



The screenshot shows the ClinData web application interface. At the top, there's a navigation bar with links for Home, Patients, Study, CRF templates, Exports, Profiles, and a Logout button. Below this, a section titled "Patients in the study: Testing study" contains a "New patient" button and a "Filters" section. The filters include search by ID, name, and sex, and dropdowns for Birth date, Enrollment date, Last update, and Study parameters. There are also "Save" and "Load" buttons. Below the filters, a table displays patient data with columns for ID, First name, Last name, Address, Sex, Birth date, Enrollment date, Last update, and Action. Two patients are listed: Eva Druhá (ID 2623) and Adam První (ID 281). Each row has an "Open" button. At the bottom, there's a pagination control showing "Showing 1 to 2 of 2 entries" and buttons for "Previous", "1", and "Next". The footer includes "© 2019 IMTM" and "2.0.5-RELEASE".



## Novel purine nucleoside phosphorylase inhibitors for treatment of T-cell leukemias

### INTRODUCTION:

Purine nucleoside phosphorylase (PNP) is the key enzyme of the purine salvage pathway. The approval (Japan in 2017) of forodesine (ImmH), a transition-state analogue inhibitor of human PNP for treatment of peripheral T-cell lymphoma, validated PNP as druggable target with potential clinical applications, namely for treatment of T-cell leukemias.

### TECHNOLOGY (INVENTION) DESCRIPTION:

We designed and synthesized novel PNP inhibitors based on acyclic nucleoside phosphonates, where the most potent compounds exhibited good potency in enzymatic assay (hPNP) but also significant cytotoxic effects in several leukemia cell lines (CCRF-CEM, MOLT-4, Jurkat). From the original SAR study, compounds JS-196 (phosphonate analogue), JS-458 (prodrug of JS-196), and JS-303 (sulfonate analogue) were selected for advanced biological evaluation. Scale up synthesis of selected candidates was developed and optimized. The tested compounds proved to be non-toxic in any of the cell lines tested under standard assay conditions, however, co-incubation of the cells with the inhibitors and 10  $\mu$ M deoxyguanosine greatly enhanced cytotoxicity of many compounds. X-ray of hPNP with inhibitor obtained.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Several potent PNP inhibitors as well as back up compounds are available in our study. The preclinical candidates are being evaluated side by side with approved forodesine. Forodesine seems to be strongly cardiotoxic, our candidates seem to be devoid of such side effects. No genotoxicity was observed. In comparison to forodesine, our compounds have better or comparable microsomal and plasma stability. Solubility is improved when compared to some previously reported PNP inhibitors. Synthesis is straightforward and has been optimized for large scale preparations.

### DEVELOPMENT STATUS (STAGE):

Preclinical studies, in vitro ADME data available, ongoing PK studies in mice, PD studies in xenograft mice in progress.

### PUBLICATIONS:

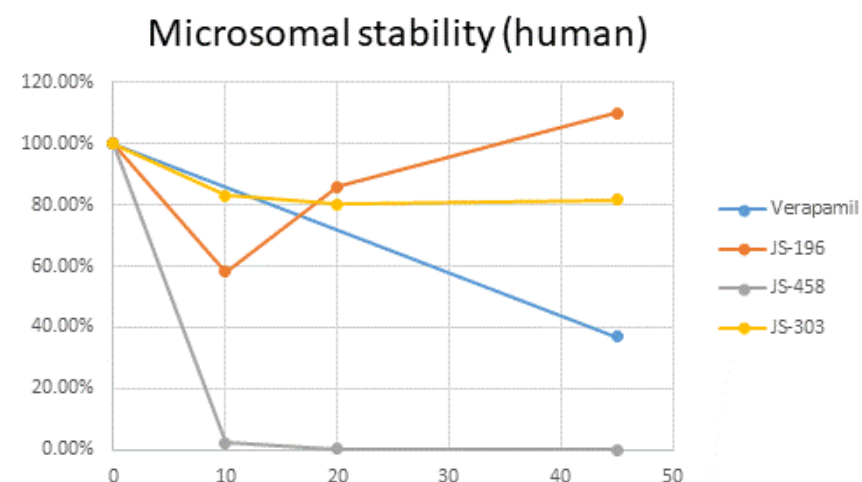
No publication at the moment. Publications are in preparation. Patent was the priority.

### IP PROTECTION STATUS:

Patent application has been submitted.

### TECHNOLOGY / IP OWNERS :

Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences



# eatris - cz

European infrastructure  
for translational medicine  
Czech Republic



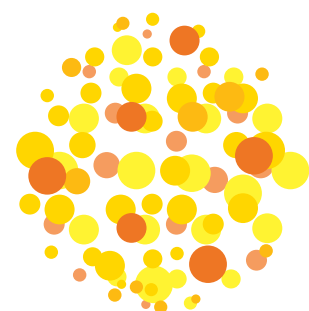
## FAST TRACK TO CLINICAL PROOF OF CONCEPT

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biospot  
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PRESENTATIONS



## EpilIntestinal – a reconstructed human tissue model for simulating drug kinetics and toxicity in small intestine

### INTRODUCTION:

Drug development is a complex process that depends on reliable and reproducible preclinical tests as new drugs often fail due to the inaccurate predictions in preclinical stage. Currently used in vitro models of gastrointestinal tract (GIT) often lack many properties of normal human intestinal barrier. We have recently developed a 3D reconstructed model of human small intestine consisting of primary human cells. This tissue closely resembles a morphology and physiology of human small intestine. It mimics the barrier properties and expression levels of key genes involved in drug metabolism and transport of its in vivo counterpart. The experiments aimed at modeling of drug absorption revealed that it outperforms older models. It is also capable to predict toxicity of certain drugs with better accuracy than animal models. In conclusion, these microtissues are a promising tool for predicting drug safety and bioavailability.

### TECHNOLOGY (INVENTION) DESCRIPTION:

We have years of experience with bioengineering various models of human epithelia to morphologically and physiologically resemble the normal human tissues. Once established, the reconstructed tissues can be produced with very high consistency, allowing reproducibility of the results obtained over a long time. The tissues are used in various areas, such as toxicology (risk assessment), cosmetics, medical device testing, studying the inflammatory response, etc. Some of these methods are accepted by OECD. The model presented here was designed to model complex processes occurring in gastrointestinal tract. It provides morphology resembling the structure of normal small intestine epithelium with villi-like structures, brush border and presence of various functional types of cells that are normally present in vivo and can be used to model complex processes occurring in the gastrointestinal tract.

### ADVANTAGES OVER EXISTING SOLUTIONS:

There are multiple in vitro models of small intestine available at the moment, including immortalized cells monolayers, artificial membranes, primary cell-based organoids and intestinal explant. All of them are capable to model certain processes, but there are known limitations in each of these, such as unphysiological barrier function or improper gene expression. Spherically shaped organoids do not provide proper access to luminal and basolateral surface, donor explants are short lived. In contrast, EpilIntestinal has normal levels of gene expression and morphology that not only mimics intestinal epithelium structure, but also allows proper observation of substance transport from both luminal and basolateral surface. The longevity of this model (~1 month) allows observing processes over time.

### DEVELOPMENT STATUS (STAGE):

Fully validated, partners to perform validation studies to establish protocols accepted by regulatory bodies needed.

### PUBLICATIONS:

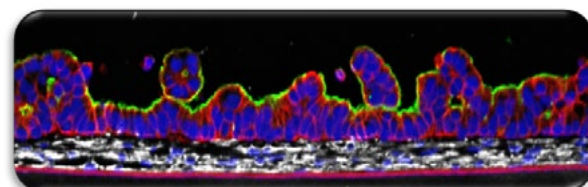
1. Ayehunie S et al., Human Primary Cell-Based Organotypic Microtissues for Modeling Small... Pharm Res. 2018 Feb 23;35(4):72. 2. Peters MF et al., Human 3D Gastrointestinal Microtissue Barrier Function As a Predictor... Toxicol Sci. 2019 Mar 1;168(1):3-17. 3. Maldonado-Contreras A et al., Shigella depends on SepA to destabilize the intestinal epithelial integrity... Gut Microbes. 2017 Nov 2;8(6):544-560. 4. Anselmo AC et al., A heat-stable microparticle platform for... Sci Transl Med. 2019 Nov 13;11(518). 5. Royston L et al., Viral chimeras decrypt the role of enterovirus .... PLoS Pathog. 2018 Apr 9;14(4):e1006962.

### IP PROTECTION STATUS:

Developed and owned by MatTek Corporation, Ashland, MA

### TECHNOLOGY / IP OWNERS :

Developed and owned by MatTek Corporation, Ashland, MA



## Complex technology for testing selectivity of new potential drugs against individual isoforms of human adenylyl cyclases

### INTRODUCTION:

A testing kit which enables determination of effect of various compounds, for example pharmaceuticals, on the activity of adenylyl cyclase isoforms. The activity of adenylyl cyclase isoforms affects cell processes, and through cyclic adenosine monophosphate (cAMP) systems, it affects many signaling functions in human cells and thus affects, for example, glucose metabolism, learning, memory and cell growth. Thus, by increasing the activity of the adenylyl cyclase isoforms, it is possible to stimulate, for example, cell growth, glucose metabolism, and processes in the brain such as memory or learning. The technology is useful to companies/institutions developing novel pharmaceuticals for a range of diseases/disorders of the brain, potentially oncological diseases or metabolic disorders.

### TECHNOLOGY (INVENTION) DESCRIPTION:

The kit for determining the specific effect on the activity of human membrane-bound forskolin-sensitive adenylyl cyclase (AC1-8) isoforms (FSK) or other chemical compounds. Membrane fractions isolated from unique HEK293 cell clones are utilized. Analysis of affecting the activity of the individual membrane bound AC isoforms is detected by measuring cAMP production by the homogeneous fluorescence time resolution (TR FRET) method. The kit contains at least one HEK293 cell clone that selectively expresses at least one AC1-8 isoform. The kit further separately comprises a lysis buffer containing hydroxyethyl piperazineethanesulfonic acid (HEPES), ethylenediaminetetraacetic acid (EDTA), MgCl<sub>2</sub> · 6H<sub>2</sub>O, dithiothreitol (DTT), sucrose, and a mixture of protease inhibitors.

### ADVANTAGES OVER EXISTING SOLUTIONS:

This is a brand new unique technology that will allow testing of substances that have not been commercially available. According to available information, this methodology is not available in the proposed scope and quality anywhere else, which can be considered as a competitive advantage for this type of testing over all existing methods of testing.

### DEVELOPMENT STATUS (STAGE):

The technologies has been significantly elaborated, optimized, tested in-vitro and characterized.

### PUBLICATIONS:

Elucidating cyclic AMP signaling in subcellular domains with optogenetic tools and fluorescent biosensors. Klausen C, Kaiser F, Stüven B, Hansen JN, Wachten D. Biochem Soc Trans. 2019 Dec 20 Regulation of adenylyl cyclase 5 in striatal neurons confers the ability to detect coincident neuromodulatory signals. Bruce NJ, Narzi D, Trpevski D, van Keulen SC, Nair AG, Röthlisberger U, Wade RC, Carloni P, Hellgren Kotaleski J. PLoS Comput Biol. 2019 Oct 30.

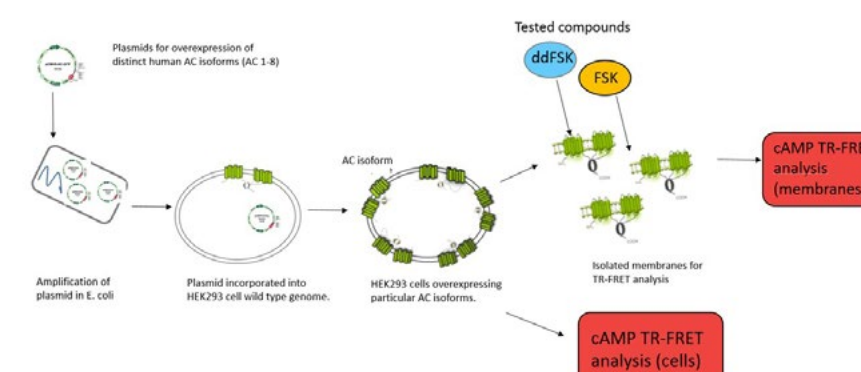
### IP PROTECTION STATUS:

2 utility models registered by the Office for Industrial Property of the Czech Republic: PUV 33151 and PUV 33391.

### TECHNOLOGY / IP OWNERS :

St. Anne's University Hospital in Brno.

### Assay for AC isoforms testing





## High voltage AC power supply for electroporation purposes in treatment of cardiac arrhythmia

### INTRODUCTION:

The electroporation generator of high voltage pulses has been the first and so far the only electroporation generator prepared for clinical interventional electrophysiology. Clinically relevant settings including ECG synchronization have been prepared in detail for preclinical and clinical use. At the same time, connection to standard catheters, electrophysiological analytical systems and oscilloscopes was prepared. It is the first alternative to current thermal technology enabling ablation of cardiac tissue. The device is used to treat cardiac arrhythmia which affects millions of people worldwide and is one of leading causes of death among cardiovascular diseases.

### TECHNOLOGY (INVENTION) DESCRIPTION:

The generator is a programmable stand-alone device using DC power as single pulses, or a set of pulses representing AC. The devices meet the safety and technical criteria for biomedical devices of the corresponding category and have been tested on an animal model to demonstrate the device's effectiveness and safety against the current radiofrequency ablation standard. The electroporation system consists of: 1.) The ECG synchronization module has the task of identifying the QRS complex sufficiently reliably by software analysis of the ECG signal and then triggering the electroporation pulse at the right time via the AC or DC power module. 2.) AC power module providing 1500V voltage and 12A current at 70-450kHz, the purpose of which was only to verify the usability of the topology.

### ADVANTAGES OVER EXISTING SOLUTIONS:

There are currently no irreversible electroporation generators available for use in interventional cardiology. In the literature it is possible to trace a number of partially modified devices originally intended for oncological and molecular biological applications, but these are sub-optimal and non-commercializable from the cardiology point of view. In the field of cancer mass reduction, the Angiodynamics Nanoknife is a commercially available device which, however, is not usable in cardiology without further technical modifications and the safety of use in the heart remains a question.

### DEVELOPMENT STATUS (STAGE):

Fully developed and tested on animal models.

### PUBLICATIONS:

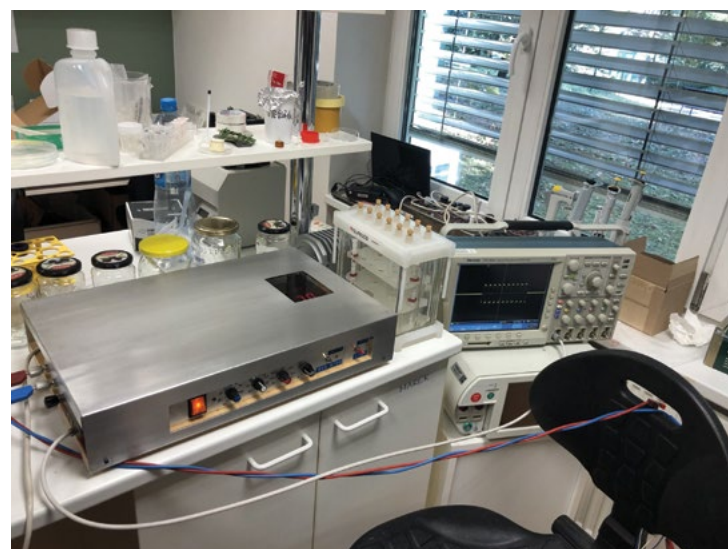
Feasibility of directional percutaneous epicardial ablation with a partially insulated catheter. Killu AM, Naksuk N, Syed FF, DeSimone CV, Gaba P, Witt C, Ladewig DJ, Suddendorf SH, Powers JM, Satam G, Stárek Z, Kara T, Wolf J, Leinveber P, Crha M, Novák M, Bruce CJ, Friedman PA, Asirvatham SJ. J Interv Card Electrophysiol. 2018 Oct;53(1):105-113. Use of Bipolar Radiofrequency Catheter Ablation in the Treatment of Cardiac Arrhythmias. Soucek F, Starek Z. Curr Cardiol Rev. 2018;14(3):185-191. Irreversible electroporation-Let's keep it cool. Caluori G, Wojtaszczyk A, Pešl M, Stárek Z. J Cardiovasc Electrophysiol. 2018 Jul;29(7):E12.

### IP PROTECTION STATUS:

Utility model registered by the Office for Industrial Property of the Czech Republic, no. PUV 33134 Patent application.

### TECHNOLOGY / IP OWNERS :

St. Anne's University Hospital in Brno.



## Telemetric system for pathophysiological stress evaluation

### INTRODUCTION:

Heart rate variability (HRV) is physiological fluctuations in heart rate that reflect activity of the autonomic nervous system. The HRV can be used as an objective indicator of the body's response to physical and mental stress and overwork. The idea of monitoring employees using HRV is to manage work packages to prevent risk of injury, burnout effect or errors due to inattentions or exhaustion.

### TECHNOLOGY (INVENTION) DESCRIPTION:

Currently, we have developed Android application for athletes. The app measures RR intervals, calculates HRV indexes and displays recommendations for further training. It is possible to modify the application for monitoring of employees which are exposed to physical or mental stress. The modification needs some minor changes in application and adding of new recommendations. The application communicates with Bluetooth Smart chest straps, which was tested with Polar H10 and Suunto Smart Sensor. HRV is evaluated in two body positions - standing for 1 minute and supine for 2 minutes. A questionnaire with subjective feelings is a part of the measurement. The measured data are sent to server where artifacts are filtered and HRV indexes are evaluated, then they are sent back to the application.

### ADVANTAGES OVER EXISTING SOLUTIONS:

HRV is already used for sport trainings and measurement of overtraining, but it is not routinely used for monitoring of employees. We know, that the old model is used at Třinecké železářny, where there is a high risk of serious injuries. The old model but requires measurement in the examination room, is not easily portable and the measurement itself takes 15 minutes. On the other hand our new system is portable, employees can measure themselves at home and the whole measurement takes just 3 minutes.

### DEVELOPMENT STATUS (STAGE):

The Android application was verified in collaboration with regional Czech First League football club.

### PUBLICATIONS:

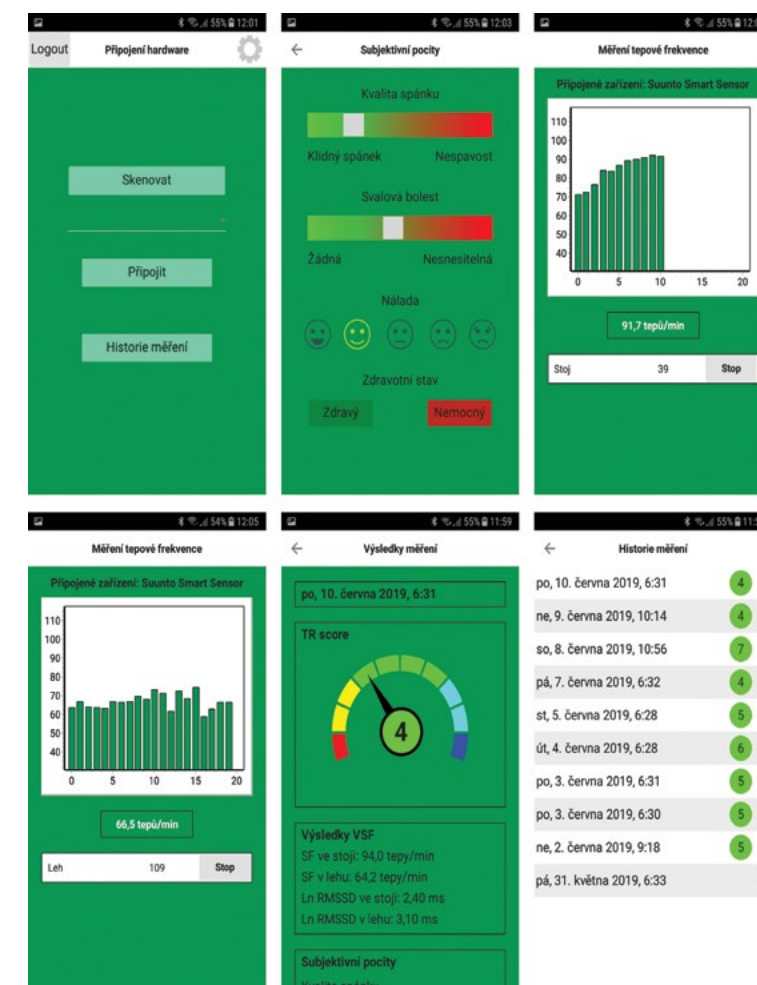
Krejčí, J., Botek, M., & McKune, A. J. (2018). Stabilization period before capturing an ultra-short vagal index can be shortened to 60 s in endurance athletes and to 90 s in university students. PLoS One, 13, 1-12. Botek, M., Krejčí, J., & McKune, A. J. (2017). Variabilita srdeční frekvence v tréninkovém procesu: historie, současnost a perspektiva. Olomouc: Univerzita Palackého.

### IP PROTECTION STATUS:

Protected as a know-how. Evaluation of measured data is performed on secured server managed by UPOL.

### TECHNOLOGY / IP OWNERS :

Palacký University Olomouc, Faculty of Physical Culture.





## MARESUS – negative per-oral contrast agent for magnetic resonance imaging

### INTRODUCTION:

Magnetic Resonance Imaging (MRI) is nowadays one of the most powerful diagnostic tools in medicine and medical science. Lack of ionizing radiation, multi-planar imaging, static and dynamic imaging capabilities and superior soft tissue contrast make MRI a potentially ideal technique for the initial evaluation and follow-up of several bowel diseases (tumors, inflammatory bowel diseases) and for improvement of the quality in diagnoses of bowel adjacent tissues and organs. However, a good distension of the intestine is crucial. Therefore, the use of oral contrast agent is mandatory. Nowadays several per-oral contrast agents are commercially available but still not used routinely.

### TECHNOLOGY (INVENTION) DESCRIPTION:

MARESUS, the technology developed by Palacký University in Olomouc, is composite consisting of 20 nm superparamagnetic iron oxide nanoparticles incorporated in bentonite matrix, which is covered by polyethylenglycol (PEG) and mixed with standardly used compounds such as salts, concentrates, aroma, preservatives etc. This makes MARESUS nontoxic and biocompatible agent with high effective negative contrast in T2-weighted images. MARESUS contrast agent is highly recommended for use in MREg (MR enterography) and primarily in MRCP (Magnetic resonance cholangiopancreatography), which is often used for imaging of biliary tree. MARESUS is helpful for patients with advanced liver cirrhosis where ascites present diagnostic problems for MRCP mainly before liver transplantation and post operation.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Synthesis of MARESUS is highly reproducible, cost effective, enabling large scale production. Compared contrast effect with commercial Lumirem, which has been recently taken of the market, we suggest much cheaper production of the contrast agent. Moreover, we show potential application of MARESUS for diagnosis of extrahepatic biliary duct and extraluminal pathologies in patients with Ascites which has never been observed before. We proved a new protocol for usage of our contrast agent in pre-operative and also post-transplantation diagnosis of liver.

### DEVELOPMENT STATUS (STAGE):

MARESUS technology was tested on 3 groups of patients. Ready to enter the registration phase.

### PUBLICATIONS:

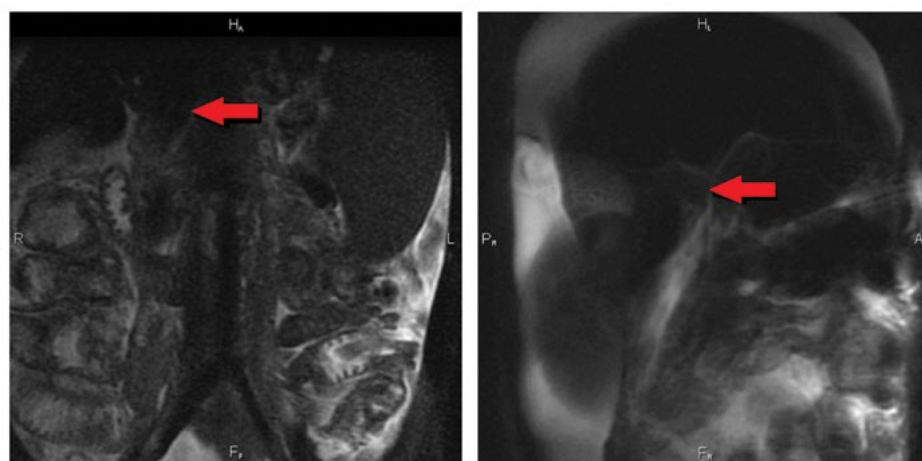
Polakova K, Mocikova I, Purova D, et al.; Magnetic resonance cholangiopancreatography (MRCP) using new negative per-oral contrast agent based on superparamagnetic iron oxide nanoparticles for extrahepatic biliary duct visualization in liver cirrhosis, Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. (2016), 160(4),512-517  
Kluchova K, Zboril R, Tucek J, Pecova M et al.: Superparamagnetic maghemite nanoparticles from solid-state synthesis as peroral MRI contrast agent and carrier for trypsin immobilization, Biomaterials 30 (2009) 2855-2863.

### IP PROTECTION STATUS:

Know-How.

### TECHNOLOGY / IP OWNERS :

Palacký University Olomouc.



MRCP without MARESUS: 52y woman before liver transplantation (OLTx) having liver cirrhosis, due to hepatitis C. Presence of advanced ascites and edema of bowel wall; arrow depicts a roughly delineation of extrahepatic biliary ducts.

MRCP with MARESUS contrast agent (same patient): in cirrhotic liver transformation there is visible improvement of extrahepatic biliary duct delineation after SPIO per-oral application.

## Portable ultrasonic device with integrated expert functions

### INTRODUCTION:

Today there is a problem of human liver dysfunction and exacerbation of a large number of diseases, the starting mechanism of which is fatty infiltration of the liver / hepatosis / steatohepatitis / fibrosis. They are usually diagnosed at the highly specialized level of care. The referrals to these links are made by family doctors in case of exacerbation of diseases that cannot be successfully detected by the means available to them. Ultrasound diagnostics is required in that case. The essence of the development lies in the first developed portable device for ultrasound diagnostics, which has integrated expert elastographic functions inherent in stationary complexes of ultrasound examination of premium level.

### TECHNOLOGY (INVENTION) DESCRIPTION:

Elastography as the main technology makes it possible to obtain images with two- and three-dimensional spatial distribution of color pixels in the region of interest, encoding the corresponding digital values of tissue stiffness on the Young's modulus in kilopascals (kPa) from the control volume. This provides a real-time black-and-white organ image in B-mode and a quantitative color map of the area of interest. The doctor can arbitrarily position the control volume in the area of interest in the most representative areas of the liver. Preliminary stiffness color map allows optimal navigation of the control volume, bypass artifacts and obtain reliable and reliably reproduced quantitative information on the stiffness of the organ area.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Guaranteed quality of the received diagnostic information through the system of ultrasound navigation in B-mode and profiles of attenuation of ultrasonic waves. Quantitative determination of liver fat for steatosis stage. Clear detection of the first stage of liver steatosis, which is reversible in active lifestyle modification - the level of competence of the family doctor. Ease of use allows active screening of steatosis in the population. Easy user training - 1-2 business days. Portability and mobility in use. Affordable cost.

### DEVELOPMENT STATUS (STAGE):

TRL 7 – System prototype demonstration in operational environment.

### PUBLICATIONS:

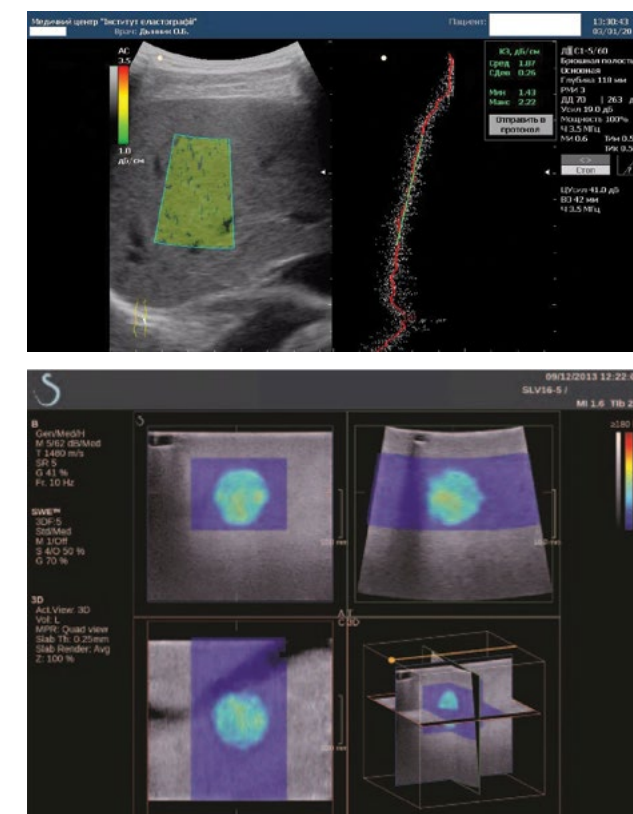
1. Dynnyk O., Kobyyiak N. Attenuation coefficient measurement (ACM) as a newest mode for ultrasound quantitative hepatic steatosis assessment // ECR 2017. Book of Abstracts.- Insights imaging (2017).- V.8 (Suppl 1.): S 451.B-1245. 2. N. Marunchyn, P. Bodnar, O. Dynnyk. Evaluation of multiparametric echography in diagnosis of nonalcoholic fatty liver disease in type 2 diabetes mellitus // Clinical endocrinology and endocrine surgery. – 2017. – T. 58, № 2. – P. 70–77. 3. Dynnyk O., Marunchyn N. ACM as novel real time ultrasound alternative to CAP (fibroscan) // Journal of Hepatology. The International liver congress-2017.-vol.66.- SAT-486.- S66.

### IP PROTECTION STATUS:

At the time of providing this information, the patent application process is underway.

### TECHNOLOGY / IP OWNERS :

Public Association „Technology Transfer Office „Up to Future“





## UVA/UVB radiation and oxidative stress protective cytokinin derivatives for cosmetics

### INTRODUCTION:

Cytokinins (CKs) are plant growth regulators (plant hormones) that play crucial role in plant development and act as signal molecules at very small concentrations. Naturally occurring CKs are based on purine moiety. First discovered CK was 6-furfurylaminopurine (Kinetin, Kin) with aromatic amine substitution at C6 atom of purine. Kin has been described as a multiactive molecule with various activities in animal and plant cells. Kin protects DNA against oxidative stress and inhibits oxidative and glycoxidative protein damage. Kin has been utilized in anti-ageing skin care so far due to its ability to delay age-related characteristics in human skin. Its 9-tetrahydropyran-2-yl derivative (Pyratine) was utilized in cosmetic due to antiaging effect on human skin as well.

### TECHNOLOGY (INVENTION) DESCRIPTION:

New kinetin derivatives possess anti-senescent, UVA/UVB radiation and oxidative stress protective activity. As the compounds are kinetin mimetics or derivatives, they were first screened in plant bioassays, especially in detached wheat leaf senescence bioassay (WLSA). Later on were selected compounds tested on human dermal fibroblasts (NHDF) and normal human epidermal keratinocytes (NHEK) as well as on HaCaT cells to exclude phototoxic effects. Besides, tests on skin cells revealed UVA and UVB photoprotective properties. New compounds suppressed induced oxidative stress in *Caenorhabditis elegans*. Stability of the most promising derivative HEO was studied in cream base. Toxicology and irritation study was performed and the leading compound was found non toxic and not irritable.

### ADVANTAGES OVER EXISTING SOLUTIONS:

New kinetin derivatives possess anti-senescent, UVA/UVB radiation and oxidative stress protective activity. As the compounds are kinetin mimetics or derivatives, they were first screened in plant bioassays, especially in detached wheat leaf senescence bioassay (WLSA). Later on were selected compounds tested on human dermal fibroblasts (NHDF) and normal human epidermal keratinocytes (NHEK) as well as on HaCaT cells to exclude phototoxic effects. Besides, tests on skin cells revealed UVA and UVB photoprotective properties. New compounds suppressed induced oxidative stress in *Caenorhabditis elegans*. Stability of the most promising derivative HEO was studied in cream base. Toxicology and irritation study was performed and the leading compound was found non toxic and not irritable.

### DEVELOPMENT STATUS (STAGE):

In vitro toxicity, senescence, photoprotection, in vivo oxidative stress, stability, irritation EpiDerm and EpiOcular.

### PUBLICATIONS:

Hönig, M.; Plíhalová, L.; Spíchal, L.; Grúz, J.; Kadlecová, A.; Voller, J.; Rajnochová Svobodová, A.; Vostálová, J.; Ulrichová, J.; Doležal, K.; Strnad, M. New cytokinin derivatives possess UVA and UVB photoprotective effect on human skin cells and prevent oxidative stress. *Eur. J. Med. Chem.* 2018, 150, 946–957, Hönig, M.; Plíhalová, L.; Doležal, K.; Voller, J.; Strnad, M.; Spíchal, L.; Vostálová, J.; Rajnochová Svobodová, A.; Ulrichová, J.; Kadlecová, A.; Plíhal, O. Adenine derivatives and their use as uv-photoprotective agents. PCT application WO2017036434A1, 2017, granted czech patent 307722 (2019).

### IP PROTECTION STATUS:

PCT application pending, Czech patent granted in 2019.

### TECHNOLOGY / IP OWNERS :

Palacký University Olomouc.



## Inhibitors of anopheles gambiae acetylcholinesterase as insecticides

### INTRODUCTION:

According to the World Malaria Report 2011, approximately 3.3 billion people are at risk for contracting malaria, and an estimated 216 million cases led to nearly 655,000 deaths in 2010. Insecticides are a proven approach to controlling the disease. However, current insecticides are hampered by their toxicity to humans and insecticide resistance.

### TECHNOLOGY (INVENTION) DESCRIPTION:

Current anticholinesterase insecticides work through covalent modification of serine, thus disabling its catalytic function and incapacitating insects. However, because this serine is also ubiquitous in the AChEs of mammals and other species, anticholinesterase insecticides are toxic to the mammals, fishes, and birds. We synthesized and evaluated the new AChE inhibitors based on phenoxyacetamide structure. Inhibition activity of these new compounds was tested on *Anopheles Gambiae* and human acetylcholinesterase. All new compounds were more potent the literature standard (2) and/or more selective inhibitors in comparison with the standard carbamate (carbofuran) or organophosphate inhibitors (paraoxon).

### ADVANTAGES OVER EXISTING SOLUTIONS:

A consequence of the limited number of insecticide classes and insecticide targets is the development of insecticide-related resistance, which highlights a vulnerability of current vector control strategies. Noncovalent inhibitors of AChE, such as the ones we have prepared and evaluated, provide valuable starting point towards novel class of insecticides and are complementary to existing covalent inhibitors. There is evidence that newly prepared phenoxyacetamides have markedly decreased in vivo toxicity to mice when compared to carbamate or organophosphate insecticides.

### DEVELOPMENT STATUS (STAGE):

In vivo tests.

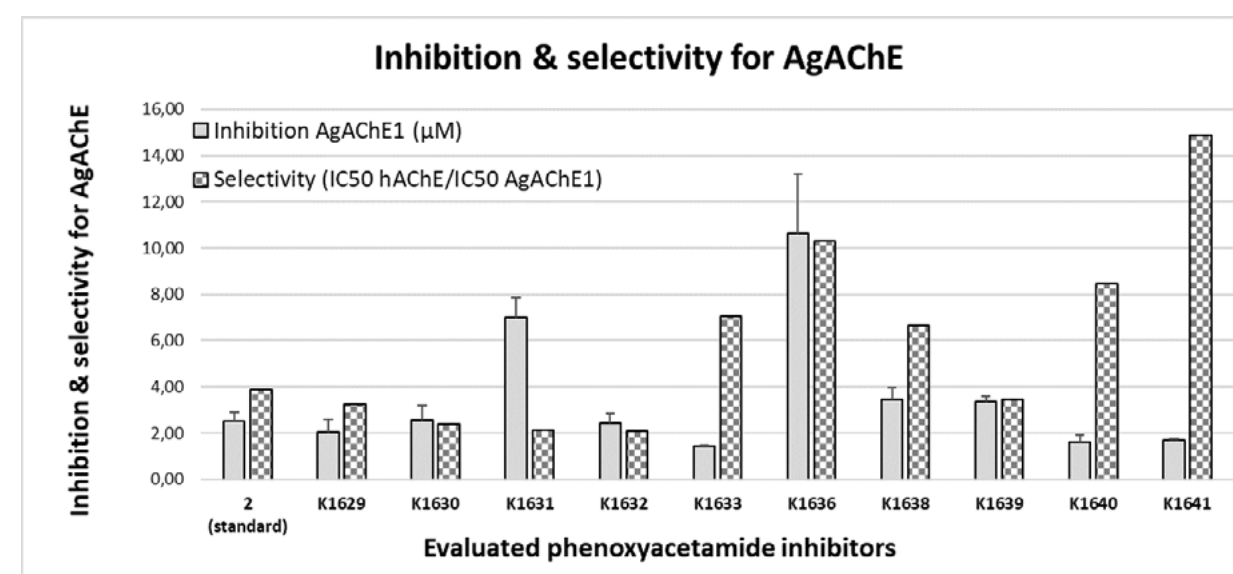
### PUBLICATIONS:

### IP PROTECTION STATUS:

Czech patent application PV 2019-660 (priority 25. 10. 2019).

### TECHNOLOGY / IP OWNERS :

University Hospital Hradec Kralove.





## Entrant

### INTRODUCTION:

Biological stress is an influential concept, capable of permeating our daily lives. After all, we encounter and speak of stressful situations on a daily basis. The concept of biological stress has also garnered considerable scientific attention in many fields of study. However, despite a vast amount of scientific literature showing that stress can affect almost every aspect of our lives, including health, work performance and general well-being, no commercially available method is currently capable of directly and objectively measuring stress levels. We at ENTRANT believe it is time to change this. Our core scientific team has developed a novel, non-invasive and objective stress measurement method which we at ENTRANT aim to put into practice.

### TECHNOLOGY (INVENTION) DESCRIPTION:

Our approach is based on measuring a novel variable: Stress Entropic Load – or SEL in short. Unlike conventional approaches based on self-reported questionnaires or physiological and biochemical stress correlates, SEL provides us with the bigger picture. Because every adaptation comes at an energy cost to the organism, monitoring that energy cost at any given moment reveals the level of stress present. SEL, which may be calculated using a set of standard physiological parameters, provides us with the required information by allowing us to calculate the entropy production of the human body, which is linked to energy flows. We thus believe that SEL works as a general marker of stress and facilitates its cumulative measurement in a wide range of fixed and mobile scenarios.

### ADVANTAGES OVER EXISTING SOLUTIONS:

Classical approaches to stress measurements are inherently unable to quantify and objectively compare stress between individuals and are unable to measure stress cumulatively. The unique approach of ENTRANT by measuring SEL allows us to overcome all these problems. Entropy production is objectively quantifiable and thus allows a comparison of stress levels between people. Furthermore, in principle, SEL may be measured for long periods of time allowing quantification of cumulative stress and applications aiming to monitor chronic stress exposure.

### DEVELOPMENT STATUS (STAGE):

We have tested our measurumest with our first prototype, supported our hyphoteses with anonymous data. And much more...

### PUBLICATIONS:

1. Bienertová-Vašků, J., Zlámal, F., Nečasánek, I., Konečný, D. & Vasku, A. Calculating Stress: From Entropy to a Thermodynamic Concept of Health and Disease. PLoS One 11, (2016). 2. Zlámal, F. et al. Stress entropic load: New stress measurement method? PLoS One 13, (2018). 3. Lenart, P. & Bienertová-Vašků, J. Double strand breaks may be a missing link between entropy and aging. Mechanisms of Ageing and Development 157, 1–6 (2016).

### IP PROTECTION STATUS:

This mathematical approach is patent pending by Masaryk University at Brno.

### TECHNOLOGY / IP OWNERS :

The one and only owner of this technology is Masaryk Univesity with closed deal on exclusive licesing to Entrant.



## Microblot—Array

### INTRODUCTION:

Microblot-Array is an immunoblot array in microtiter plate format designed for efficient multiplex diagnostics. The complex evaluation of test is ensured by using the Microblot-Array Software in combination with the Microblot-Array Reader. The clinical areas covered by this platform are infectious serology and autoimmunity diseases.

### TECHNOLOGY (INVENTION) DESCRIPTION:

The technology is based on the same principles as immunoblot, but microplate is used. Recombinant antigens are spotted on nitrocellulose membrane that is fixed at plastic pad and forms bottom of each well. During the test specific antibodies from a sample bind with recombinant antigen in a well. The wells are then washed and incubated with conjugate. During this incubation the bound antibodies react with the alkaline phosphatase labelled antibody. Visualization of this reaction is done by incubation with substrate solution. Reaction is stopped by distilled water. Intensity of the reaction of antigen spots is measured by the Reader and results are evaluated with the Software.

### ADVANTAGES OVER EXISTING SOLUTIONS:

The technology eliminates the bottleneck of traditional BLOT processing and capacity and opens the way to high throughput testing and automation. Each well contains control and calibration spots for verification of presence of conjugate and control spots that guarantee the functionality and sensitivity of the kit. Wells contains also calibration spots that are necessary for quantitative evaluation. Antigens are spotted in triplicate which minimizes statistical variation. Complex antigen composition allows to distinguish between bacterial species and autoimmunity diseases. The test requires only 10µl of sample which is beneficial especially in case of CSF samples and kid patients.

### DEVELOPMENT STATUS (STAGE):

The platform is available on the market (for Borrelia, Chlamydia and ANA). New parameters are being developed.

### PUBLICATIONS:

Not published yet.

### IP PROTECTION STATUS:

n/a

### TECHNOLOGY / IP OWNERS :

TestLine Clinical Diagnostics s.r.o.





## Novel hybrid lincosamide antibiotics

### INTRODUCTION:

Lincosamides are ribosome-targeting antibiotics of high clinical importance. The most efficient lincosamide, clindamycin, is listed by WHO as one of the key antibiotics. It is used against infections caused by G+ staphylococci and streptococci, including methicillin-resistant *Staphylococcus aureus* (MRSA). Owing to the excellent tissue penetration, clindamycin is the first choice drug to treat bone and teeth infections, deep abdominal infections and some anaerobic infections (G+ or G-). Moreover, clindamycin is used to treat malaria in combination with quinine. However, increasing incidence of MRSA strains with associated macrolide-lincosamide-streptogramin (MLS) cross-resistance becomes a limiting factor for clindamycin application against these multi-resistant strains. Further, inefficacy of clindamycin (and also most other antibiotics) against *Clostridium difficile* can result in pseudomembranous colitis, a complication with serious consequences.

### TECHNOLOGY (INVENTION) DESCRIPTION:

We developed a set of new hybrid lincosamides with a potential to become superior drugs compared to industrially produced and clinically used lincosamides, clindamycin and less efficient lincomycin. Market significance: The product could reach the market size in human medicine ~150 mil. USD/year just in USA (600 mil. USD yearly in total considering that USA covers 25% of the world market). Veterinary medicine additionally represents the same size of market (estimated based on current market size for clindamycin and less efficient lincomycin). The potential of the market of antimalarials: 219 million malaria cases, 435 000 deaths worldwide.

### ADVANTAGES OVER EXISTING SOLUTIONS:

At least one of the new hybrid lincosamides (1) is significantly more efficient (1-2 orders of magnitude) against *S. aureus*\* including MRSA resistant strains, *Staphylococcus epidermidis*\*\*, *Staphylococcus haemolyticus*\*\*, *Enterococcus faecium*\*, and *Streptococcus pneumoniae* compared to clindamycin; (2) has its activity more than 10x improved compared to clindamycin against strains with *ermC* resistance determinant, which confers macrolide-lincosamide-streptogramin (MLS) resistance; (3) is effective against seven out of eight tested *Clostridium difficile*\*\*\* strains resistant to clindamycin; \*On the ESKAPE list of pathogens against which new antibiotics are urgently needed according to WHO \*\*These strains account for 30-50% of all bacteraemia (bacteria presence in blood) episodes among very preterm infants and children with cancer; reservoirs of resistance genes for more virulent strains; \*\*\*453 000 cases, 29 000 deaths in the USA.

### DEVELOPMENT STATUS (STAGE):

TRL3-4; chemical synthesis in 100mg-10g scale from industrially produced lincomycin available.

### PUBLICATIONS:

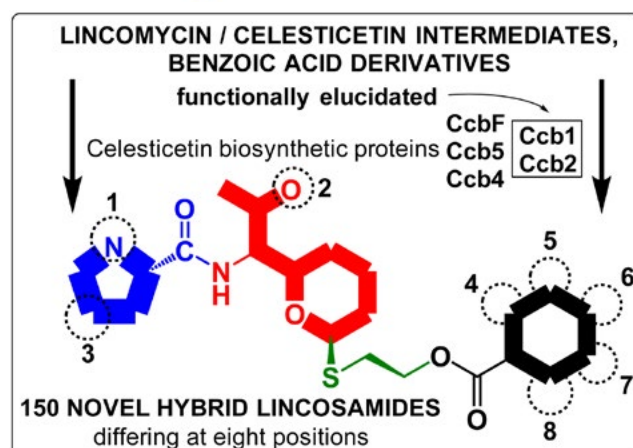
Elucidation of salicylate attachment in celesticetin biosynthesis opens the door to create a library of more efficient hybrid lincosamide antibiotics. Kadlcik S, Kamenik Z, Vasek D, Nedved M, Janata J. Chem Sci. 2017 May 1;8(5):3349-3355.

### IP PROTECTION STATUS:

Protected by WO2018161979 (A1) (EU and US); CZ307305 (B6), granted 11.04.2018; priority 10.03.2017.

### TECHNOLOGY / IP OWNERS:

Institute of Microbiology of the Czech Academy of Sciences.



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- Large and diverse patient groups complemented with unique tissue biobanking
- Proof-of-concept clinical trials
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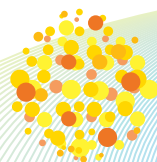
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779 00 Olomouc  
Czech Republic





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Patent and Trade Mark Attorneys

Cleveland Scott York is a dynamic, client-focused firm of patent and trade mark attorneys with offices in the City of London, Hertfordshire, the Thames Valley and Brussels. The firm provides comprehensive intellectual property services to a wide range of clients both in Europe and further afield, from SMEs to multi-nationals. The firm's dedicated patent and trade mark teams provide tailored, commercially-relevant advice to clients in all sectors.

The firm's patent team advises on all aspects of patent protection and has a wealth of expertise drafting and prosecuting patent applications in all jurisdictions, as well as advising clients on infringement and validity issues.

The team also has experience of handling disputes, representing clients in patent oppositions and conducting appeals before the Boards of Appeal of the European Patent Office. A significant volume of the department's work comes from direct clients, and as a result, Cleveland Scott York IP's patent attorneys have expertise in drafting originating applications and advising on strategy.

The firm has considerable experience in working with the technology transfer arms of academic institutions, having worked with, amongst others Reading, Swansea and Bath universities for many years.

Partner Adrian Bradley works with several academic institutions in Prague and has been appointed to the Business Advisory Board of the Institute of Organic Chemistry and Biochemistry (IOCB), part of the Czech Academy of Sciences. Sophie Maughan, Partner, is the IP adviser on the Pharmaceutical Industry Networking Group (PING).

The firm is also actively involved with IP professional institutions and has active committee members for FICPI, Marques and CIPA. Three of the patent Partners are also visiting IP lecturers, lecturing at the universities of Reading, Kingston and Hertfordshire. Firm professionals are regular contributors of articles relating to intellectual property for a number of industry sector publications.

The firm looks to help companies understand all of their options so that they protect their intellectual property through an ongoing programme of webinars.

The 2017 merger between the two well-respected IP firms, Cleveland IP and Scott & York IP means that the new organisation is able to provide wider coverage and possesses deeper technical experience.

The firm continues to work with clients to ensure they are informed of the implications of issues such as Brexit and how this affects their IP.

Cleveland Scott York attorneys:

## **Nick Bennett**

Nick Bennett is a Partner in Cleveland Scott York's chemical patent practice. His work spans the fields of pharmaceuticals, medical devices, industrial chemistry and mechanics. The core of Nick's practice is patent drafting and prosecution before the European and UK Patent Offices. However, a substantial portion of his work involves advocacy in Oppositions and Appeals before the European Patent Office. He frequently works on due diligence exercises, provides infringement opinions, and prepares client's portfolios for litigation in the UK courts.

He has worked on many medical technologies such as drug delivery, small molecule pharmaceuticals, skincare devices, spinal surgery apparatus, bone cement compositions and diagnostic testing.

Nick lectures on intellectual property at Kingston Business School and at one of London's leading start-up incubators. He spent time based with a firm in Los Angeles during 2016/2017, which gave him some valuable insights into US practice.

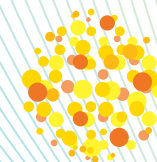
## **Dr Adrian Bradley**

Dr Adrian Bradley is a Partner at Cleveland Scott York. His practice is devoted to helping clients achieve their strategic goals by devising and implementing intellectual property strategies to support them.

His practice focusses on healthcare, with specialisms in medical devices and pharmaceuticals. Having trained as a patent attorney in the pharmaceutical industry with Wyeth (now Pfizer), Dr Bradley has a detailed knowledge of product lifecycle management in the sector. He has worked extensively on Supplementary Protection Certificates and advises on regulatory data exclusivity.

He has a particular interest in technology transfer, regularly advising academic institutions around the world on obtaining effective protection for their innovations through patents. His enthusiasm for technology transfer stems from a belief that pioneering medical innovations made in university research laboratories deserve to be in the hands of doctors and saving the lives of patients. He undertakes a significant amount of pro bono work in areas of unmet clinical need in developing countries, such as tuberculosis in India.

Dr Bradley has acted as lead IP counsel for many university spin-out companies, in areas as diverse as neurodegeneration (Cholesteryl), anti-infectives (Lucilia), peptide synthesis, and image-guided medical procedures. He also acts as European counsel for a number of university research foundations in the United States, notably the University of Utah Research Foundation.



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In addition to his technology transfer practice, Dr Bradley acts as European representative for a multinational medical device company. He has handled numerous matters of commercial significance, including oppositions and appeals at the European Patent Office, particularly in the field of minimally invasive surgical methods.

He is a member of the Business Advisory Board of the Institute of Organic Chemistry and Biochemistry (IOCB) in the Czech Republic, a visiting lecturer at the University of Reading, and has delivered many seminars and lectures on technology transfer (and other IP related subjects) in the UK, Europe, Asia and the United States. He is a member of the continuing professional development committee of the Chartered Institute of Patent Attorneys.

## **Andrew Mackenzie**

Andrew helps businesses register Intellectual Property Rights throughout the world and advises on commercial exploitation, enforcement and defence of those rights. He also carries out due diligence and advises on IP portfolio management.

He is a Legal 500 "Recommended Lawyer" over multiple years and has recently been described by The Legal 500 as "personable, articulate and a good listener". He is listed as one of the World's Leading Patent Practitioners in the Intellectual Asset Management Patent 1000, 2014-2017 and is recommended there for his "outstanding prosecution practice" and also as "a go-to guy for ... companies that require close attention". He has been recognised also as a "Recommended Prosecution Practitioner", by IAM 2015-2017.

## **Fraser Brown**

Fraser Brown is a Chartered UK and European Patent Attorney with over 20 years' experience in private practice. Fraser regularly represents clients in oppositions and appeals at the European Patent Office and has experience of patent litigation in the UK courts.

His practice includes freedom to operate exercises, patent infringement and validity opinions, advising on patent portfolio strategy, in addition to the core tasks of patent drafting and prosecution. Fraser's background in materials science and engineering is valued by clients operating in various fields including metallurgy, automotive and industrial bearings, polymer processing and forming, dental compositions, nanotechnology, medical devices, electronic materials and mechanical engineering.

Fraser is particularly interested in the commercial implications and possibilities of patents and intellectual property and has advised on IP licensing, dispute resolution,

and due diligence in business transfers.

## **Jonathan Midgley**

Jonathan advises companies on a broad range of subject areas from simple mechanical devices to complex communication network technology.

Jonathan looks after the needs of UK based clients, from a large analogue and digital integrated circuit manufacturer to small start-up companies. Jonathan is also responsible for assisting multinational corporations with their patent portfolios. His principal specialisations are in the field of telecommunications, signal processing, analogue/digital circuit design and general electronics.

## **Michael Williams**

Michael's work mainly involves representing clients before the European Patent Office and the UK Intellectual Property Office.

Michael has many years' experience in drafting and prosecuting patent applications and has particular experience in oral proceedings, oppositions and appeals at the European Patent Office. He also advises on infringement and validity of third-party patents. Before entering the patent profession Michael was an examiner at the European Patent Office.

## **Sophie Maughan**

Sophie has over fifteen years' experience advising clients on Intellectual Property matters. She is qualified as both a Patent Attorney and a Trade Mark Attorney and advises clients on all aspects of IP protection and enforcement relating to patents, trade marks and designs. She is described by The Legal 500 2013 as "proactive and professional".

In relation to patents, Sophie works with clients in the chemical and life sciences fields. She has particular experience in working with clients in the medical field, in areas such as orthopaedic implants, medical devices, pharmaceuticals and laboratory research equipment. Sophie has gained extensive experience dealing with issues relating to methods of treatment and diagnosis before the European Patent Office. Sophie works with multinational companies, SMEs and universities, on matters such as patent drafting, prosecution, and infringement.

## **Tom Faulkner**

Tom has particular experience in assisting businesses to obtain patent protection in the UK, Europe and elsewhere for products with a mix of Mechanical, Electrical and



Software elements.

He has worked mainly for applicant companies and thus has significant experience in writing patent specifications. He has worked across a range of technical areas over the past 20 years, from mechanical configurations to complex new software. Tom is noted for his sharp understanding, and his clients value the speed with which he can understand their complex new products. Particular areas of expertise include analytical, medical and laboratory equipment, and data telemetry systems.



#### HARBER IP s.r.o.

Your safe harbour in the IP world by Kateřina Hartvichová & Ingrid Beránková Ambrozová

HARBER IP is a Prague-based IP boutique firm focused on attorney and advisory services related to registration, prosecution, management, enforcement, monitoring, transfer and commercialization of intellectual property rights, in particular patents, trademarks, utility models and designs. In addition to that, HARBER IP offers services of valuation of intellectual property assets, patent searches and freedom-to-operate evaluations of products and technologies.

From the moment of creation of the invention till the grant of a patent, and further throughout the life of the patent until its expiry, as well as in contentious proceedings related to invalidations, cancellations, or enforcement, HARBER IP remains a strong and reliable partner offering professional advice with a client-friendly approach.

HARBER IP and its team members are qualified to represent clients before the Industrial Property Office of the Czech Republic, European Patent Office, European Intellectual Property Office, and international authorities involved in proceedings relating to international patent applications and trademarks (such as PCT and WIPO). Through a worldwide network of cooperating IP specialists, HARBER IP coordinates IP matters of its clients around the globe.

HARBER IP is proud to represent and cooperate with prestigious Czech universities and research institutions of the Academy of Sciences of the Czech Republic, as well as numerous innovative industry companies.

HARBER IP's team is known for its remarkable expertise in patent matters, especially in the field of chemistry, life

sciences and pharmaceuticals, as well as in procedural matters related to patent proceedings on Czech, European and PCT levels. In matters related to technology transfer and commercialization of IP, the team's biggest strength and passion is representing and negotiating complex commercialization agreements on behalf of Czech inventor teams with global industry players. Transfer of knowledge and education in the field of intellectual property is also an important part of HARBER IP's professional mission – not only for the general public, but mostly for researchers, technology transfer specialists and professionals in the field.

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**CzechInvest**, the Investment and Business Development Agency of the Ministry of Industry and Trade, works with businesses based in the Czech Republic to support their development and encourages overseas companies to look at the Czech Republic as their partner of choice. Since its establishment in 1992 CzechInvest has successfully facilitated 2,010 projects, with an estimated investment of USD 45,900 million and which have created more than 300 thousands direct jobs.

CzechInvest focuses on supporting those sectors in which it sees significant potential for development. Apart from Life Sciences our target areas include Nanotechnology and Advanced Materials, Information & Communication Technologies, Engineering, Automotive & Green Mobility, Aerospace, Electrical Engineering & Electronics as well as Business Support Services to provide backup for the sectors mentioned above.

Our services include the provision of information and advice on doing business in the Czech Republic, sector specific market intelligence, access to a broad spectrum of financial support, identification of business properties, potential business partners, suppliers or acquisition prospects as well as organizing tailor made visits to the Czech Republic. All services we provide are free of charge as part of the government's business support measures.

We are proud to support BioSpot 2020 and we will be available to you during the whole event as well as anytime afterwards, should you consider to expand your business in the Czech Republic.



**MatTek** is at the forefront of tissue engineering and is a world leader in the production of in vitro 3D reconstructed human tissue models for the regulatory toxicology. Our skin, ocular, mucosal and respiratory tissue models address toxicology and efficacy concerns throughout the cosmetics, chemical, pharmaceutical, and household product industries.

The outstanding reproducibility and high relevance of MatTek's human cell-derived 3D tissue models provides impressive results in the number of international multi-laboratory validation studies. Our EpiDerm and EpiOcular models are validated by OECD as an alternative to animal testing.

In 2009, the subsidiary of MatTek Corporation, with the business name MatTek In Vitro Life Sciences Laboratories s.r.o. (IVLSL) was established in Slovakia, Bratislava. In 2012, the commercial production of EpiDerm tissue model in MatTek IVLSL has started, the production of EpiOcular tissue model followed in 2013. In 2017, the third model from MatTek Corporation portfolio, EpiIntestinal tissue model, the reconstructed model of the human small intestine was successfully implemented into the offer of MatTek IVLSL.

The extension of production capabilities in Europe enabled MatTek partners better accessibility to products in a shorter time and eliminating administrative processes related to customs clearance.

MatTek IVLSL is planning in 2020 implementation of next three reconstructed tissue models from the portfolio of MatTek Corporation, models of full-thickness reconstructed human epidermis, EpiDerm FT, pigmented epidermis tissue model, MelanoDerm and mucociliary tissue model consisting of tracheal/bronchial epithelial cells, EpiAirway.

The main task of our company is the research and developing of the new tissue models and methods, which allow to reduce or replace using of animals in the laboratory tests for chemicals, cosmetics, pharmaceuticals, household product, pesticides, medical devices, etc. MatTek IVLS is, therefore, a member of numbers of scientific societies, organizations as SETOX (Slovak Toxicology Society), ESTIV (European Society of Toxicology In Vitro), EUSAAT (European Society For Alternatives To Animal Testing), CELLTOX (Associazione Italiana Tossicologia In Vitro).

Scientists of MatTek IVLSL actively support and educate researchers over the world to spread alternative testing methods. We organize and participate in regular meetings with students, young researchers and toxicologists

worldwide and offer free of charge training for alternative testing methods with the use of MatTek In Vitro tissue models.

MatTek's 3D tissue models are used throughout the United States and Canada, Europe, Japan, and Asia by lead testing laboratories, educational institutions, and corporations. We invite you to use our products, services, and technical solutions, which brings your company new opportunities in obtaining faster, cost-effective, more reliable and relevant results compared to the traditional assays and 2D in vitro systems.



**The Cancer Research Foundation Czech Republic** (CR-Cz, [www.vyzkumrakoviny.cz](http://www.vyzkumrakoviny.cz)) was established in 1997 in accordance with Act No. 227/1997 Coll. as a charitable organization. Its founders, professors Vladimír Mihal, MD., PhD. and Marian Hajduch, MD., PhD. are internationally recognized experts in this field and founder of personalized medicine for cancer patients in the Czech Republic.

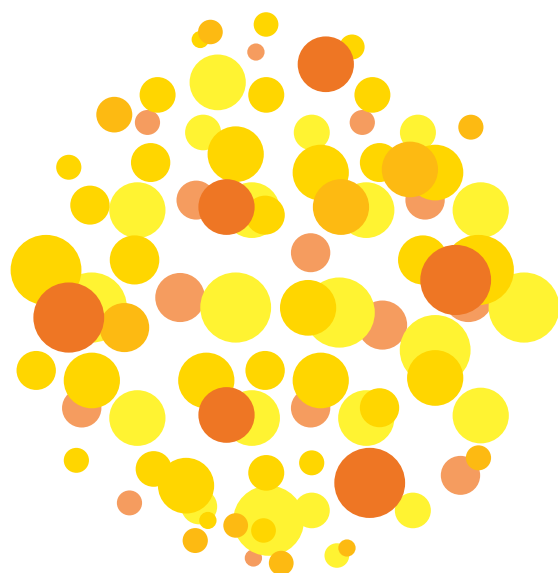
For over 23 years, the Foundation has systematically supported cancer research and public education relating to the prevention, early diagnosis, better treatments and, ultimately, a cure for cancer. CR-Cz promotes and facilitates collaboration among scientists to accelerate the pace of discovery from bench to bedside.

In order to conquer this devastating disease, we fund scientists and laboratories in the Czech Republic to study cancer at its most fundamental level. Currently, our projects include improving cancer prevention strategies, developing early-detection tools and advancing targeted cancer therapies.

Our work would not be possible without the support of individual donors across the Czech Republic and abroad. With continued support, we will continue to foster collaboration amongst scientists and across disciplines; provide seed funding and flexibility for innovative ideas and research; and maintain our long-term vision and commitment to cancer research.

As an example of our recent efforts, the CR-Cz initiated and funded innovative program of cervical cancer prevention for women not attending standard cytology-based screening, implementing self-sampling procedure and molecular detection of HPV infection ([www.vyzkumrakoviny.cz/samoodberovy-hpv-test](http://www.vyzkumrakoviny.cz/samoodberovy-hpv-test)).





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