

Affiliated with:



Department of Molecular
Neurooncology

Head of Department:
Prof. Katarzyna Rolle



Laboratory of Mammalian Model Organisms

Established in January 2020

Presentation of Laboratory service offer
Poznań, 26.03.2026



Laboratory of
Mammalian Model Organisms

Łukasz Przybył, PhD
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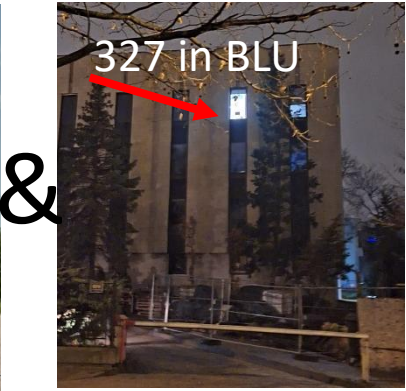
web site <https://portal.ichb.pl/laboratory-of-mammalian-model-organisms/>

Laboratory of Mammalian Model Organisms (LOMMO)

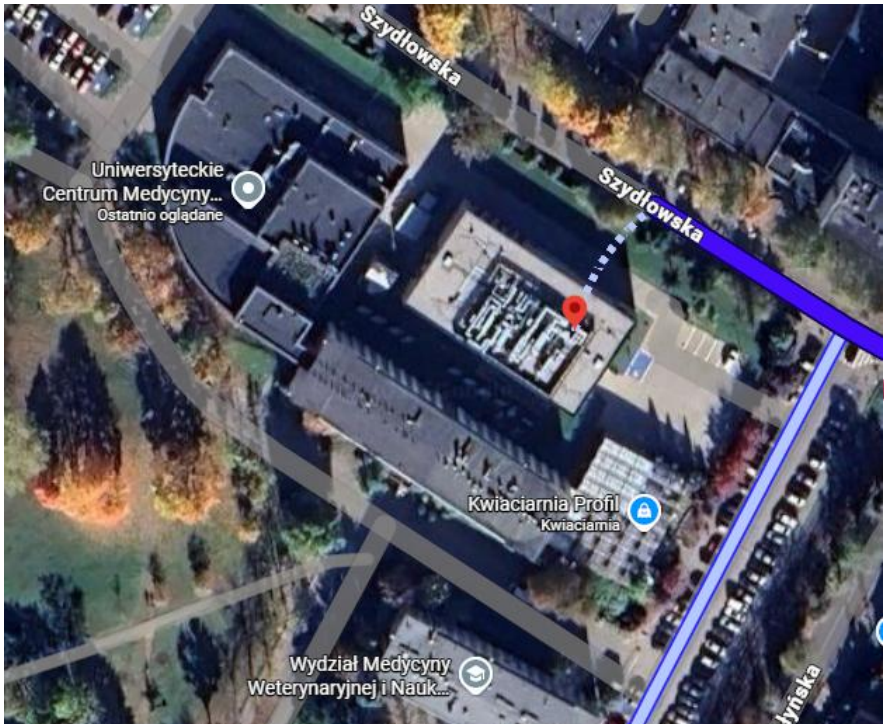
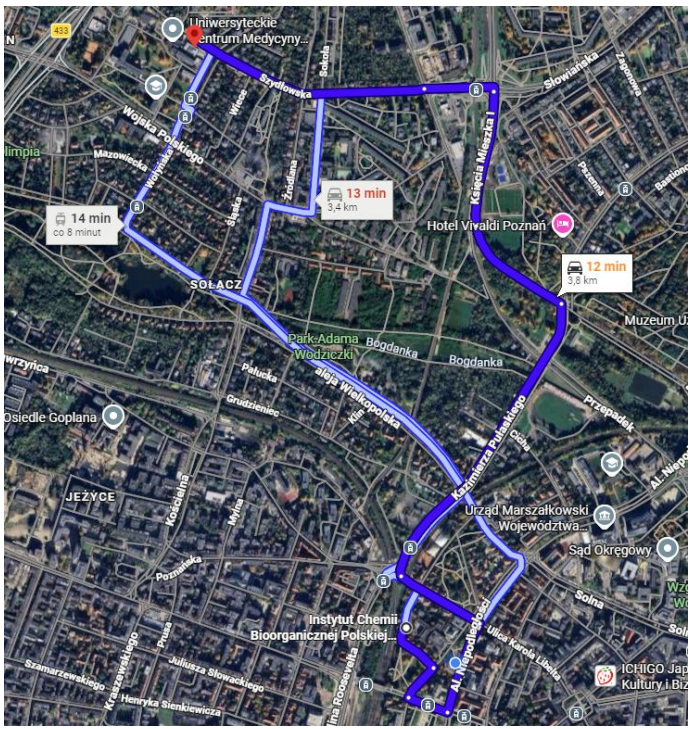


Laboratory of Mammalian Model Organisms (LOMMO)

University Center for Advanced Technologies and Health, Adam Mickiewicz University



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History of LOMMO

January 2020

June 2022

April 2024

November 2025

Monika Przybył, PhD
Senior biologist
Research Support Unit



Łukasz Przybył, PhD
Head of Laboratory



Dorota Wronka, MSc eng.
Biologist



Anna Karlik, MSc
Product developer



Magdalena Surdyka, PhD
adiunkt



Konrad Kuczyński, PhD
Chief Specialist for Research
Equipment

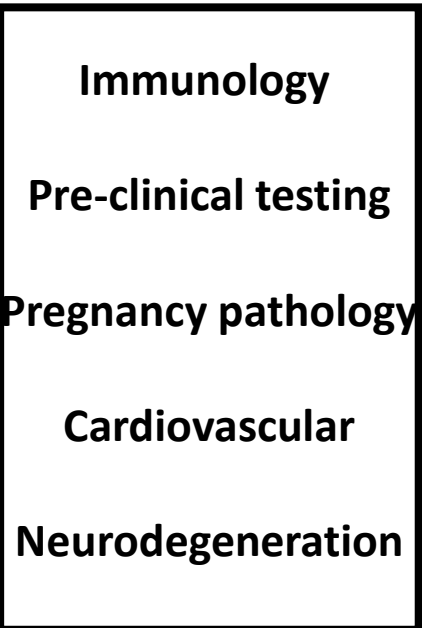


Marcin Cholewiński, PhD
Chief Specialist for Research
Equipment

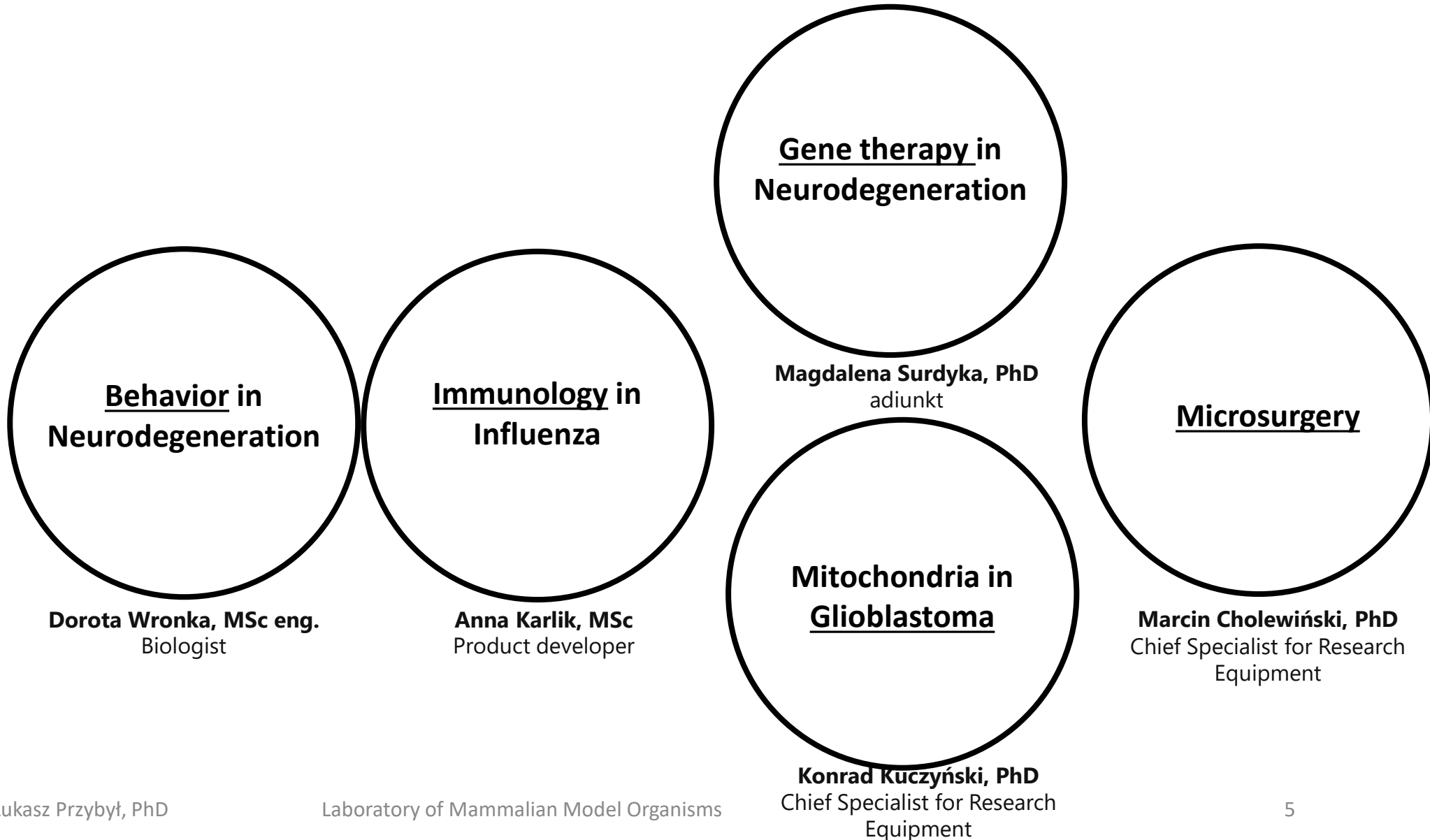


Monika Przybył, PhD
Senior biologist
Research Support Unit

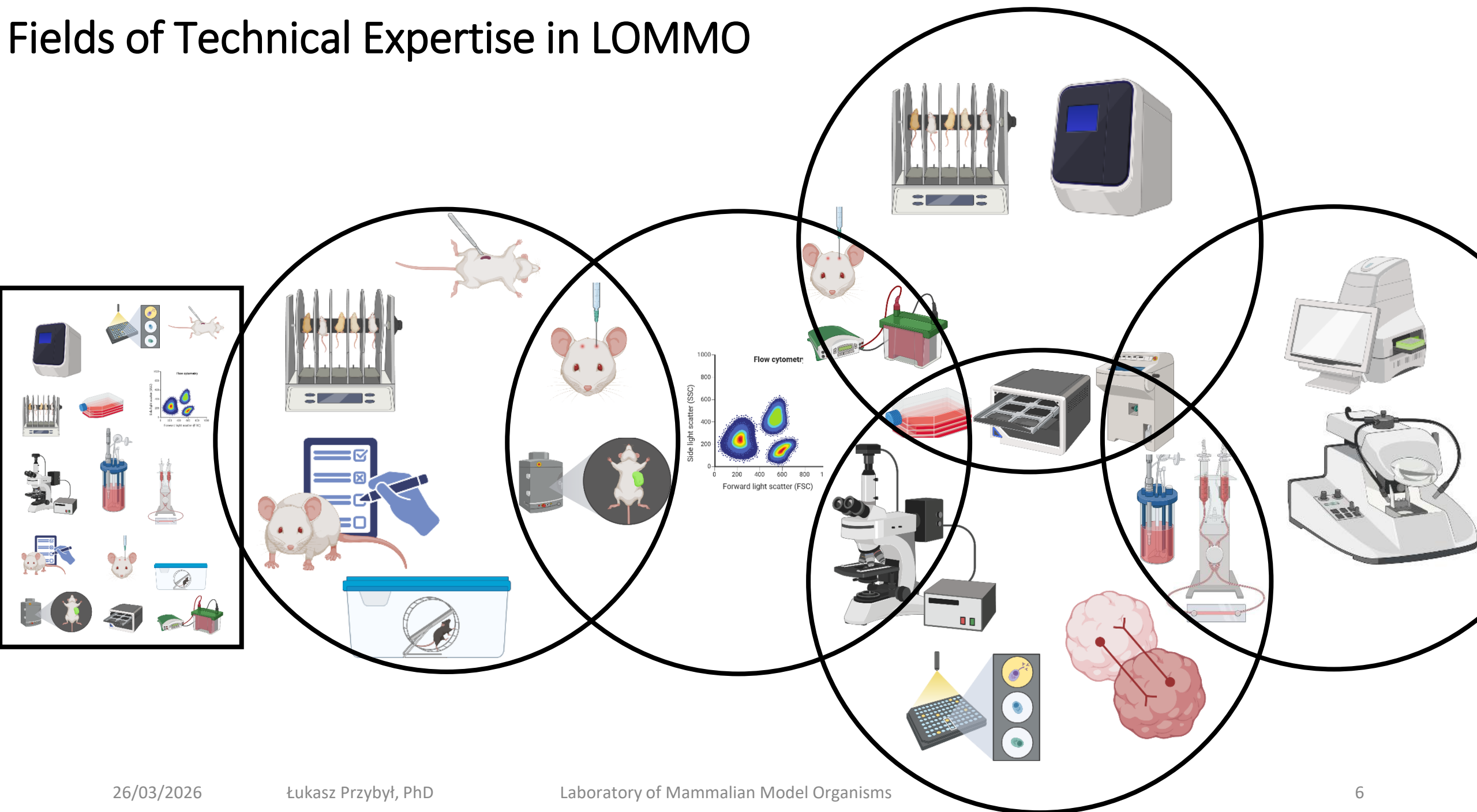
Fields of Research Experience in LOMMO



Łukasz Przybył, PhD
Head of Laboratory



Fields of Technical Expertise in LOMMO



IDEA FOR IN VIVO EXPERIMENT

PLAN

PERMISSIONS

PREPARATION

PERFORMANCE

ANALYSIS

**MATERIAL READY
FOR ANALYSIS**

**FIGURES READY
FOR PUBLISHING**

WHAT DO WE OFFER?

experimental design
planning a budget

PLAN

Local Ethics Committee or Ministry of Environment or Pharmaceutical Inspectorate
organisation of animal transport
documentation to work with laboratory animals

PERMISSIONS

training in basic techniques used in animal research
mouse colonies (transgenic or wild-type) and databases
keeping experimental records

PREPARATION

PERFORMANCE

injections: intramuscular, intraperitoneal, subcutaneous, intracranial
intra-stomach administration (oral gavage)
implantation of osmotic pumps
behavioral testing and phenotypic observations
transcardial perfusion, organ weighing and sampling, blood withdrawal
en face preparation of whole aorta
brain dissection into structures
acute kidney injury and uninephrectomy
xenograft inoculation
immunization
bronchoalveolar lavage

In vivo

In vitro

immunophenotyping using flow cytometry
primary cell cultures
hybridoma generation
genotyping
qPCRs, Western blot, ELISA, immunostainings
iPSCs and organoid cultures

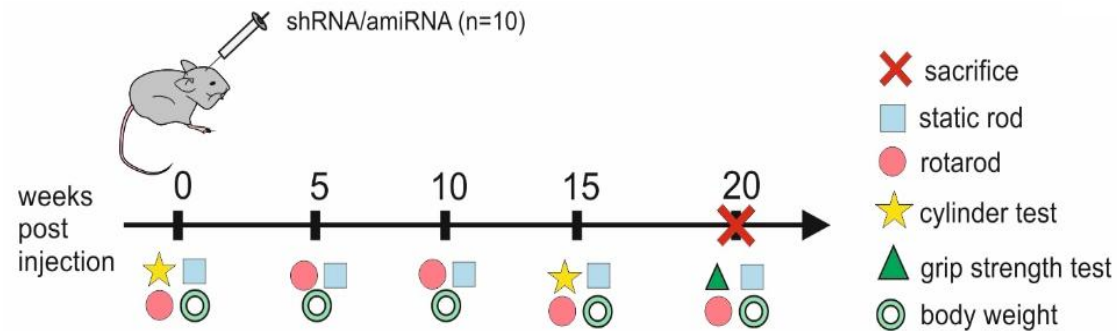
ANALYSIS

digitalization of data acquired during animal experiment
statistical analysis and figure preparation

PLANNING AND PREPARATION

Experimental design

- Selection of appropriate models and methodology
- Timeline
- Budget



Database and colony management

- generate experimental groups
- sustain the mouse lines
- track generations and in-bred factor

Zlecono	Cage number	Animal ID	Genotype	Date of Birth	Sex	Generation	Parent male	Parent female	Experiments planned
Ayca's breeding cages NEW		3539	WT	2021-11-12	F		3365	416	new breeding cage on 16/02 - experimental zone
		2282	WT	2021-12-27	M		413	418	new breeding cage on 16/02 - experimental zone
		3538	WT	2021-11-12	F		3365	416	new breeding cage on 26/01 - experimental zone
		3540	WT	2021-11-12	M		3365	416	new breeding cage on 26/01 - experimental zone
		2217	WT	2021-11-30	F		413	418	new breeding cage on 31/01 - experimental zone
		2218	WT	2021-11-30	F		413	418	new breeding cage on 31/01 - experimental zone
		3541	WT	2021-11-12	M		3365	416	new breeding cage on 31/01 - experimental zone
		3542	WT	2021-11-12	M		3365	416	new breeding cage on 04/02 - experimental zone
		2219	WT	2021-11-30	F		413	418	new breeding cage on 04/02 - experimental zone
		3804	WT	2022-02-16	F		2221	2220	new breeding cage on 04/03 - experimental zone
	3806	WT	2022-02-16	M		2221	2220	new breeding cage on 04/03 - experimental zone	
Breeding zone BC's		416	WT	2021-04-10	F	F:1	1973	1970	w parze zarodowej
		418	WT	2021-04-10	F	F:1	1973	1970	w parze zarodowej
		2220	WT	2021-11-30	F		413	418	w parze zarodowej
		2279	WT	2021-12-22	F		3365	416	w parze zarodowej
		2280	WT	2021-12-22	F		3365	416	w parze zarodowej
		3365	WT	2021-03-02	M	F:1	1973	1970	w parze zarodowej
		413	WT	2021-04-10	M	F:1	1973	1970	w parze zarodowej
		2221	WT	2021-11-30	M		413	418	w parze zarodowej
		2281	WT	2021-12-22	M		3365	416	w parze zarodowej
1 sentinel									
2	3901	WT	2022-01-18	F			413	418	
	3902	WT	2022-01-18	F			413	418	
	3802	WT	2022-02-02	F			3365	416	
3	3807	WT	2022-02-16	M			2221	2220	
	3808	WT	2022-02-16	M			2221	2220	
	3818	WT	2022-03-14	F			2281	2280	
4	3819	WT	2022-03-14	F			2281	2280	
	3820	WT	2022-03-14	F			2281	2280	
	3821	WT	2022-03-14	F			2281	2280	
	3822	WT	2022-03-16	F			2281	2279	
5	3832	WT	2022-03-16	M			2281	2279	
	3833	WT	2022-03-16	M			2281	2279	

+

≡

BL6/N BCs ▾

BL6/N F:1 ▾

BL6/N x CDR1as M2 BCs ▾

BL6/N x CDR1 as M2 F:1 ▾

CDR1as M2 BCs ▾

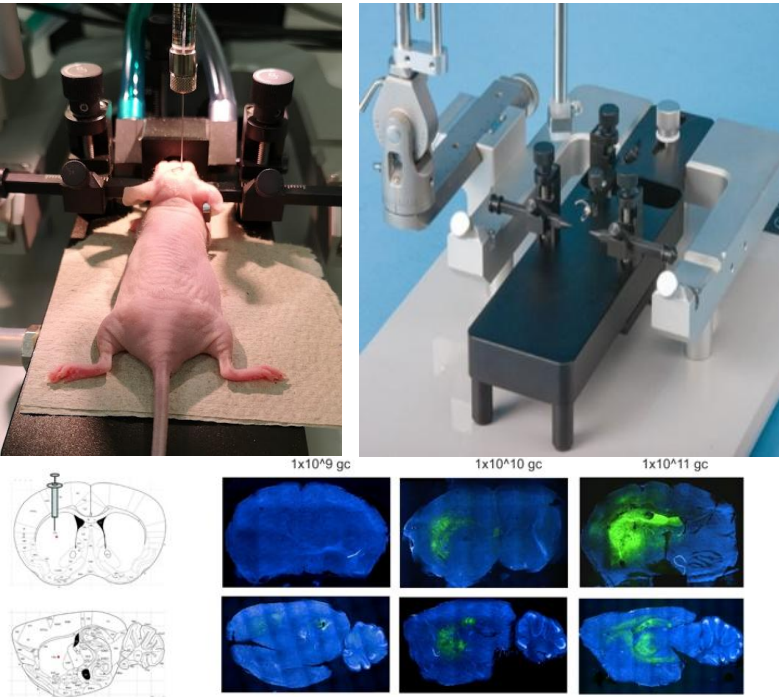
CDR1as M2 F:1/F:2 ▾

OLD BC ▾

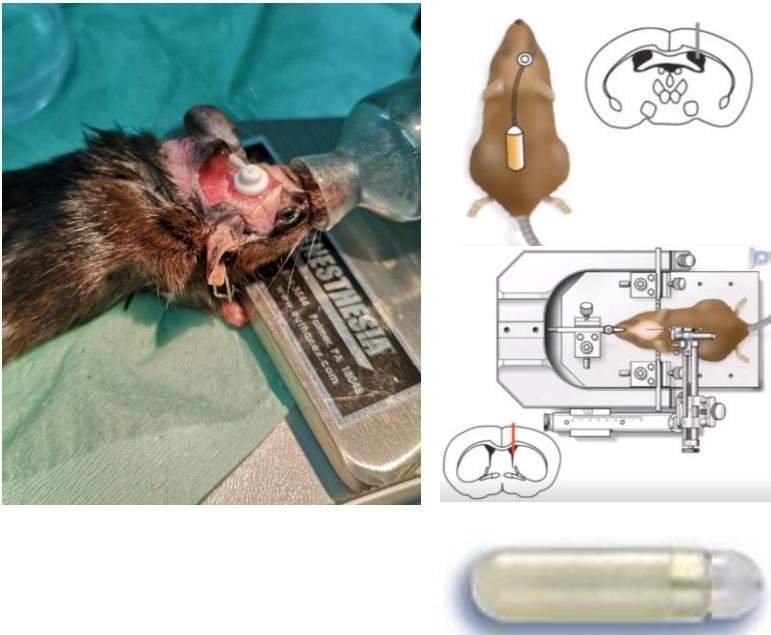
Sacrificed ▾

SURGERIES

Intracranial delivery



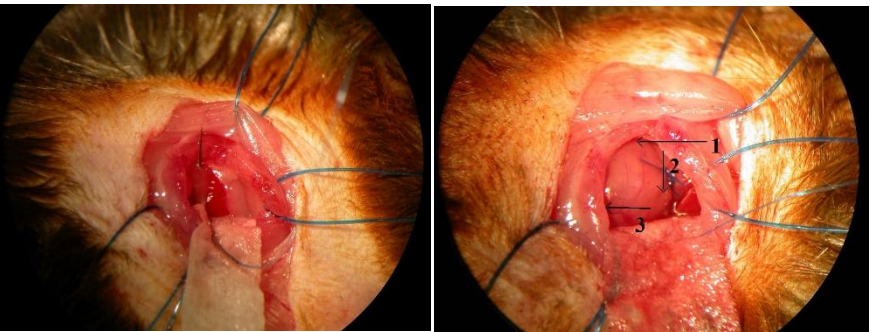
Implantation of osmotic pump



Tumor inoculation



Myocardial infarction and myometrium injections



Biopsy and oral gavage



Uninefrectomy / Acute Kidney Injury



BEHAVIORAL TESTING

Rotarod Test



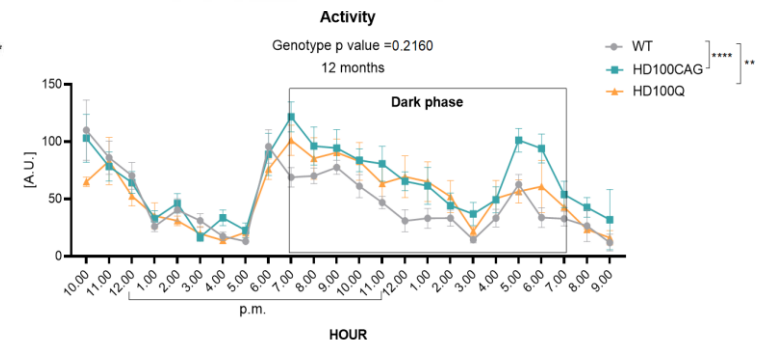
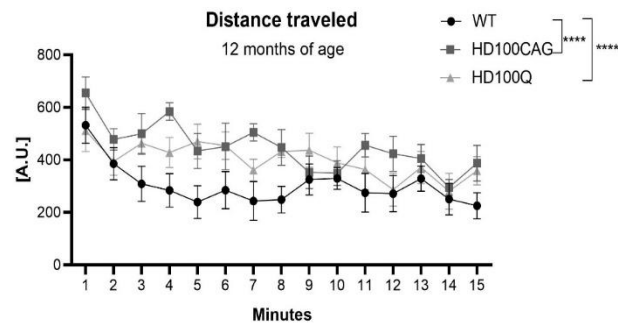
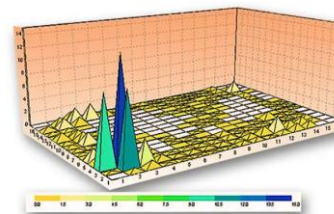
Static rod Test



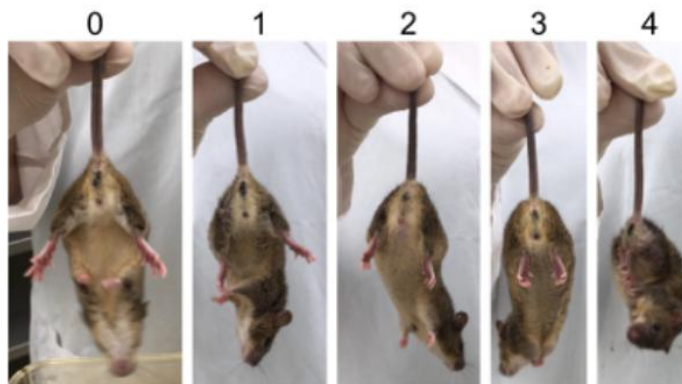
Open-Field Test



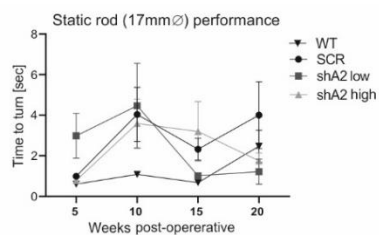
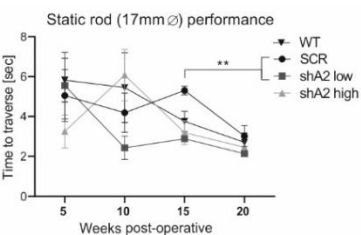
Daily Activity Test



Hindlimb Test



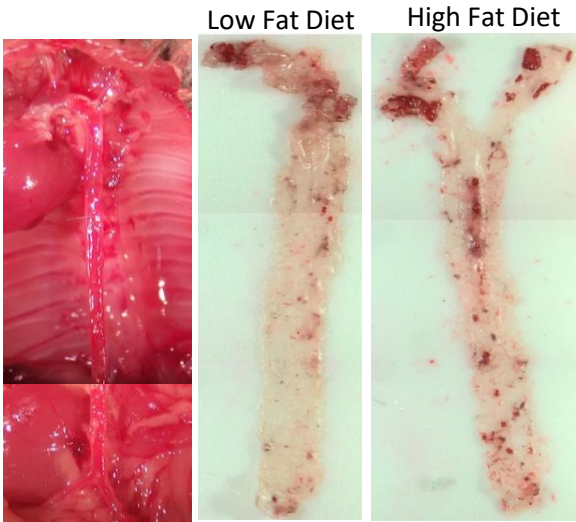
Beaker Test



TISSUE PROCESSING

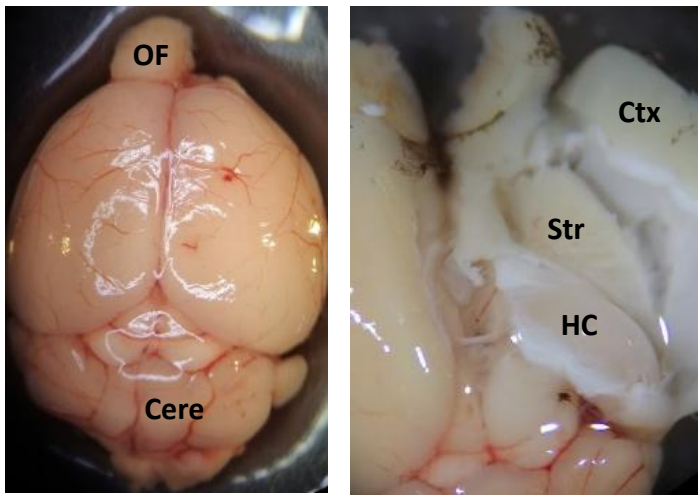


Isolation of aortas *en face*



Oil red O

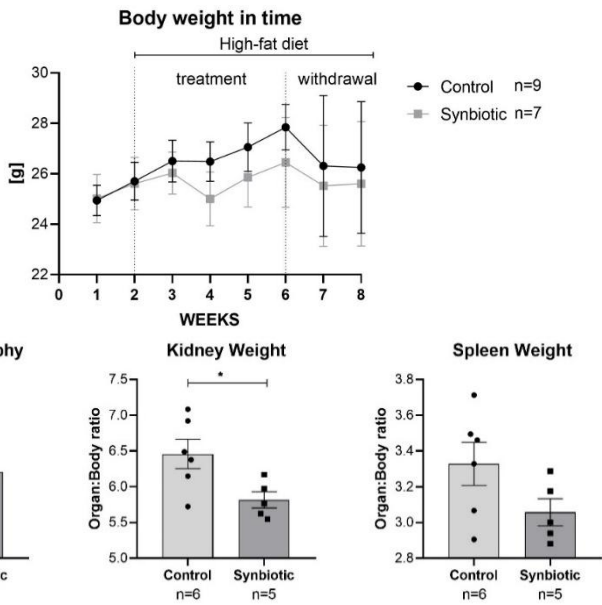
Dissection of brains into structures



Transcardial perfusion

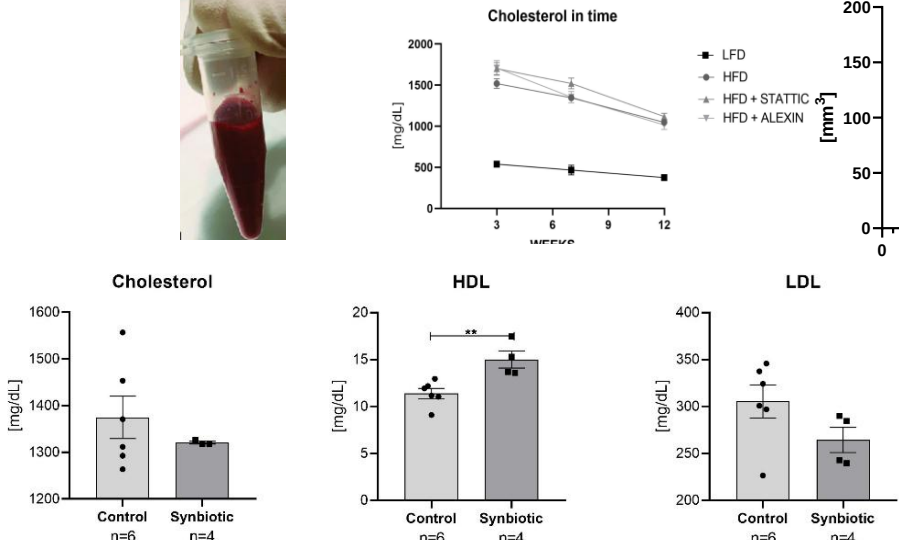


Tissue and animal weighing



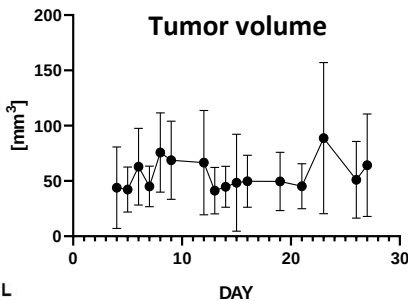
26/03/2026

Blood sampling and biochemical analysis in serum/plasma



Łukasz Przybył, PhD

Measuring tumor size

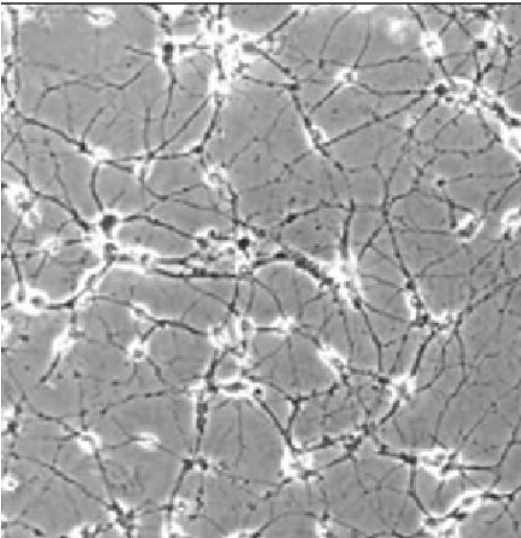


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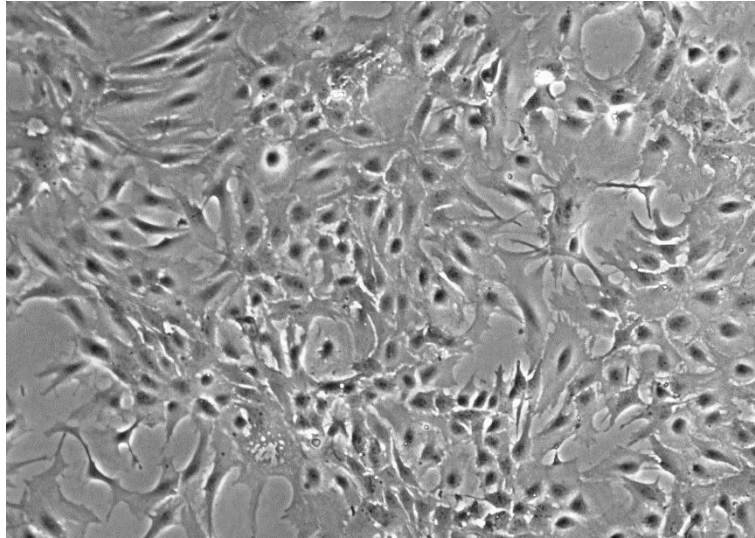
PRIMARY CELL CULTURE

- Mouse embryonic fibroblasts (MEFs)
- Vascular smooth muscle cells (VSMCs)
- Bone marrow-derived macrophages
- Neurons
- Astrocytes

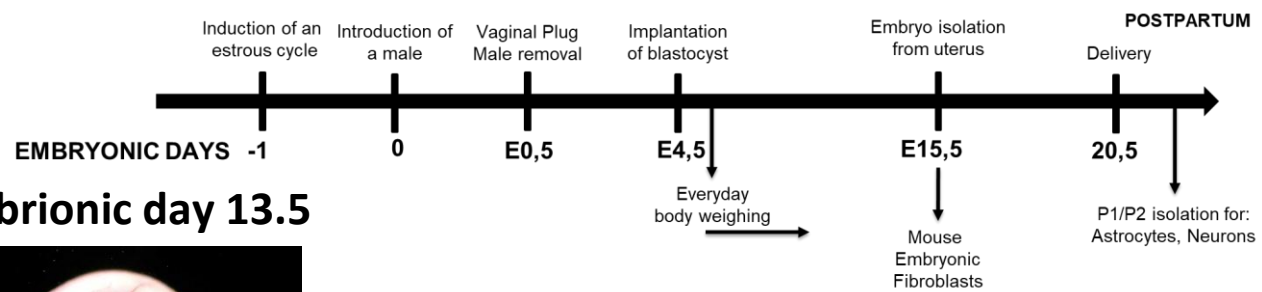
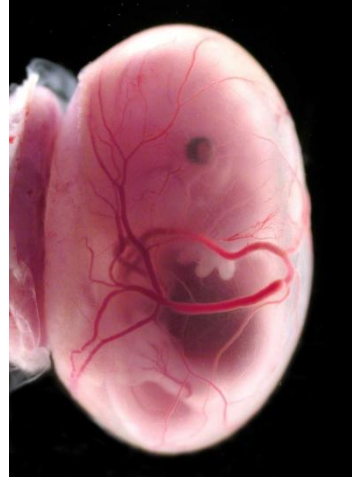
Neurons



Astrocytes



Embryonic day 13.5



FLOW CYTOMETRY

- Cell cycle
- Proliferation (Ki67)
- Apoptosis and necrosis (Annexin V, 7AAD)
- Immunophenotyping

Mouse:

T cells (effector, helper1, helper17, $\gamma\delta$ T cells, regulatory, central memory, effector memory, naive)

CD3, CD8, CD4, $\gamma\delta$ TCR, CD44, CD62L, CD69, CD25, FoxP3, T-bet, Helios, ROR γ t

M cells (B cells, monocytes, M1 macrophages, M2 macrophages, gMDSC, mMDSC)

CD11b, CD11c, Ly6C, Ly6G, B220, CD86, CD206

Cytokines

TNF- α , IL-17, IFN- γ , IL-6, IL-1 β

Rat:

T cells (helper T cells, effector T cells)

CD3, CD4, CD8

M cells (B cells, NK cells, neutrophils, monocytes, macrophages)

CD43, CD161, B220, His48

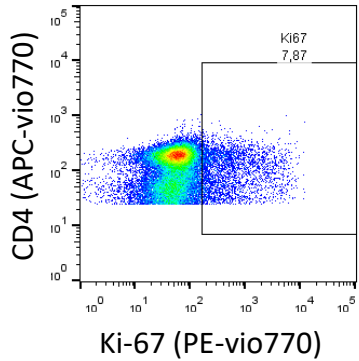
Human:

T cells (helper T cells, effector T cells, $\gamma\delta$ T cells)

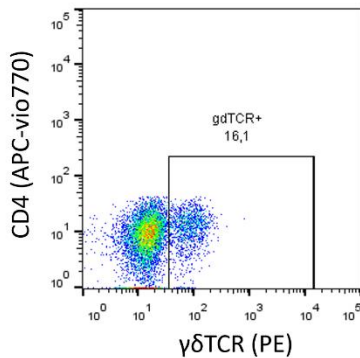
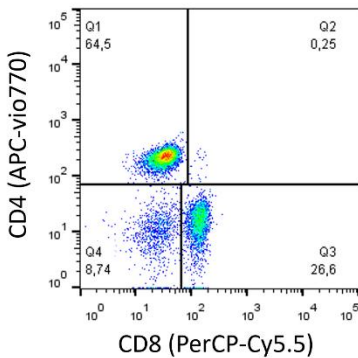
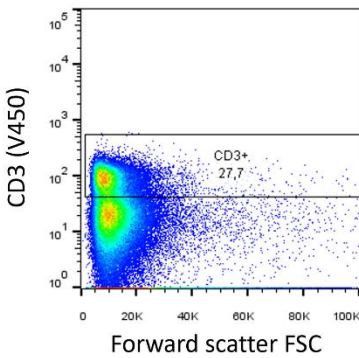
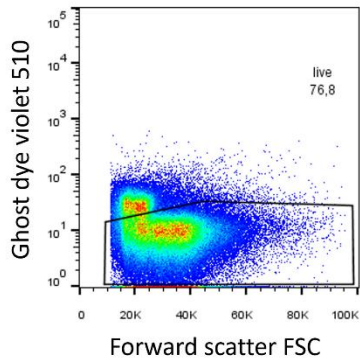
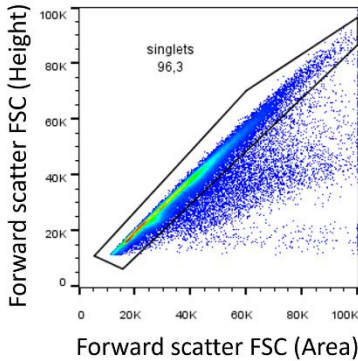
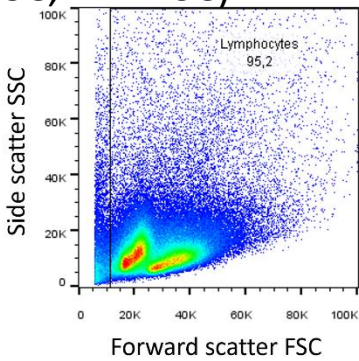
CD3, CD8, CD4, $\gamma\delta$ TCR, CD44, CD25

B cells

B220



NovoCyt



EQUIPMENT

In vivo:

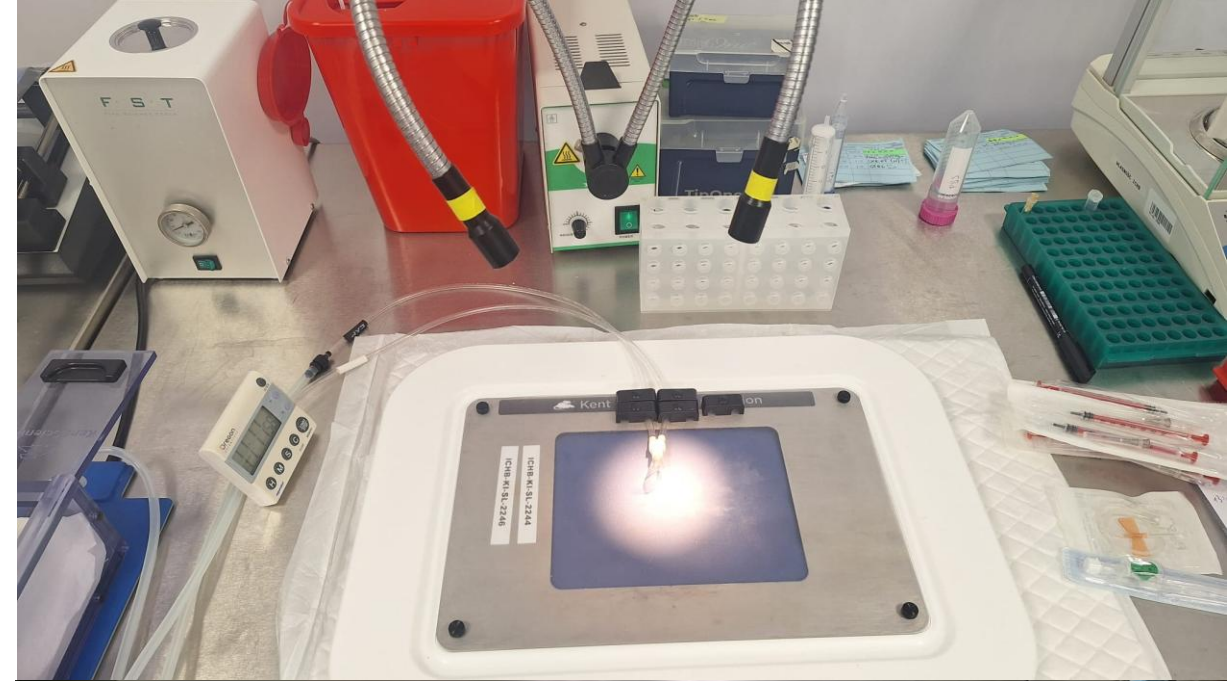
- Individually Ventilated Cage (IVC) System (Tecniplast)



EQUIPMENT

In vivo:

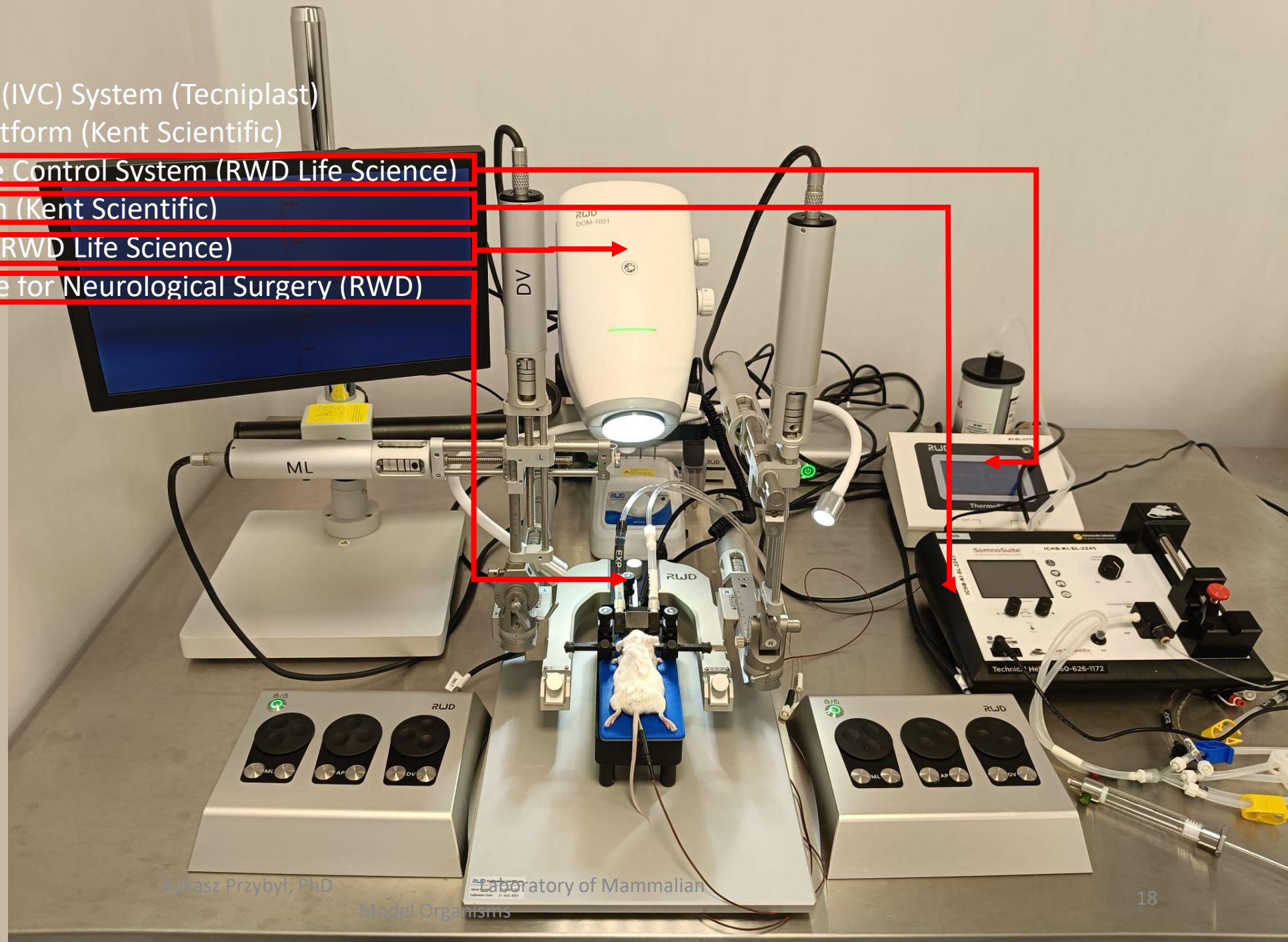
- Individually Ventilated Cage (IVC) System (Tecniplast)
- Multi-functional Surgical Platform (Kent Scientific)
- Surgical Instruments (FST, RWD)



EQUIPMENT

In vivo:

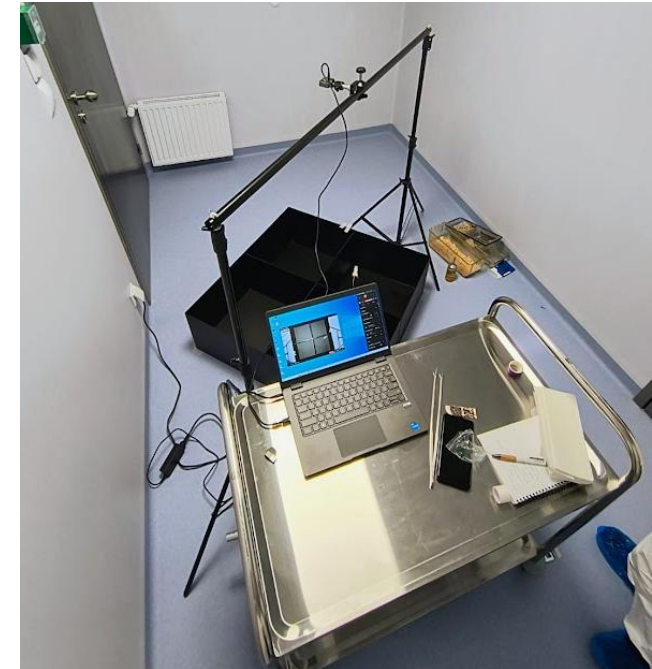
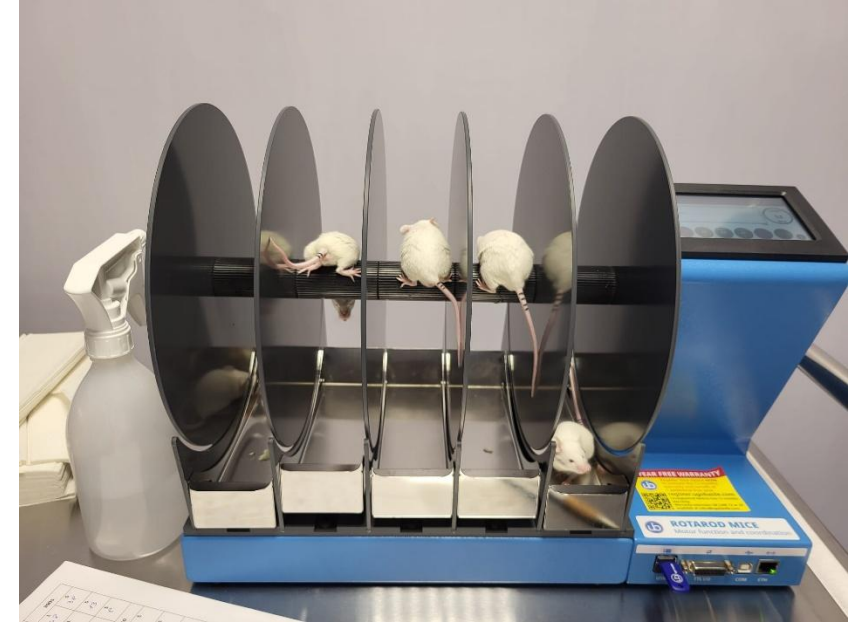
- Individually Ventilated Cage (IVC) System (Tecniplast)
- Multi-functional Surgical Platform (Kent Scientific)
- Mouse and Rat Temperature Control System (RWD Life Science)
- Low-Flow Anesthesia System (Kent Scientific)
- Digital Surgical Microscope (RWD Life Science)
- Automatic Stereotaxic Frame for Neurological Surgery (RWD)



EQUIPMENT

In vivo:

- Individually Ventilated Cage (IVC) System (Tecniplast)
- Multi-functional Surgical Platform (Kent Scientific)
- Mouse and Rat Temperature Control System (RWD Life Science)
- Low-Flow Anesthesia System (Kent Scientific)
- Digital Surgical Microscope (RWD Life Science)
- Automatic Stereotaxic Frame for Neurological Surgery (RWD)
- Mouse and Rat Pulse Oximeter – Junior (Kent Scientific)
- Endotracheal Intubation Kit for Mice and Rats (Kent Scientific)
- Stereoscopic Microscope (Nikon)
- Capillary Microinjection Pump (RWD)
- Peristaltic Perfusion Pump (WPI)
- Surgical Instruments (FST, RWD)
- Analytical Scales
- Rotarod (Ugo Basile)
- Open Field Test System
- Motor Dysfunction Analysis System (ANY-maze)
- Laboklav 195B Autoclave (SHP)



EQUIPMENT

Post mortem:

- Cryostat 1950 (Leica)
- Automatic Vibratome VT1200S (Leica)
- Thromboelastometer (ROTEM)
- Precellys Evolution Touch Homogenizer (Bertin)



26/03/2026



Łukasz Przybył, PhD



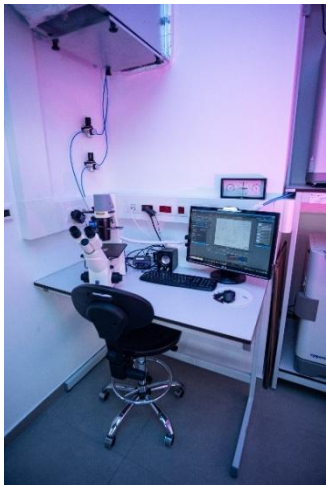
Laboratory of Mammalian Model Organisms

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EQUIPMENT

In vitro

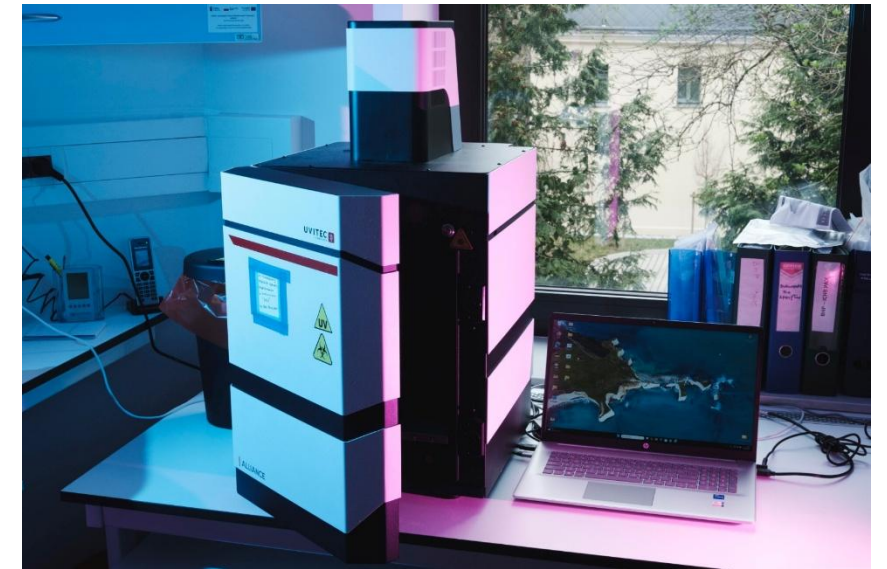
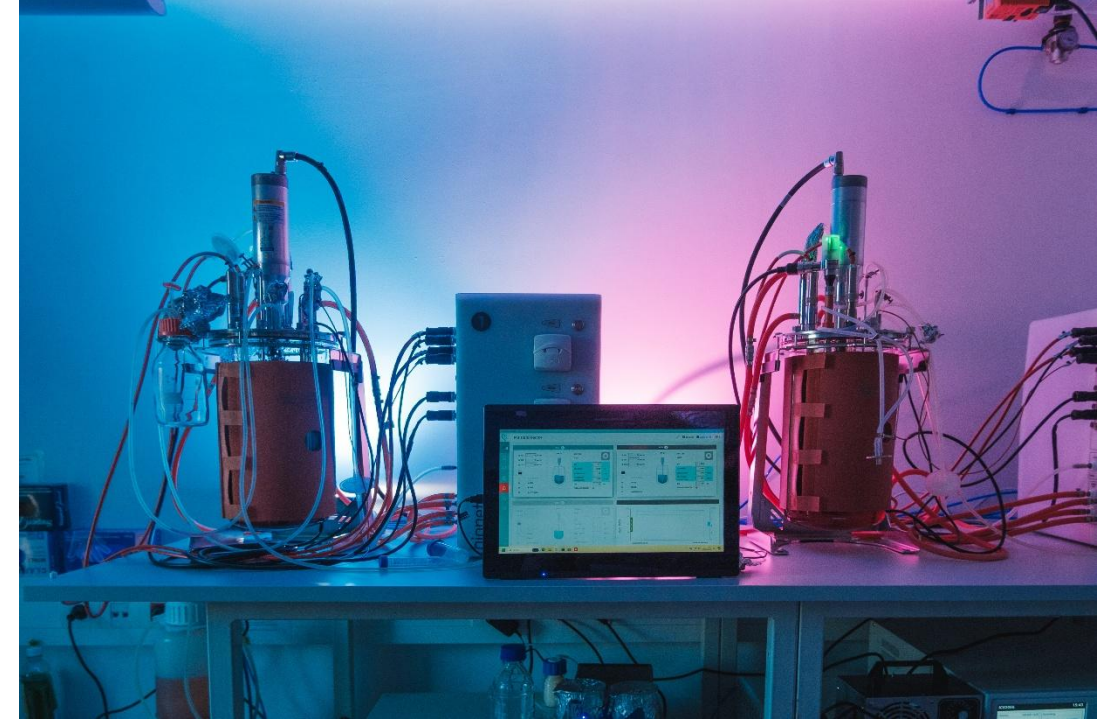
- Laminar Flow Cabinet (Alpina)
- CO₂ Incubators for Cell Culture (Heraeus, Eppendorf)
- UVP Laboratory Incubator
- Automated Cell Counters (Bio-Rad, Luna)
- Nucleofector (Lonza)
- Pump System for Long-Term Flow Cell Cultures under Physiological Conditions (Ibidi)
- Incucyte S3 Live-Cell Analysis and Real-Time Functional Assay System (Sartorius)
- 3-Laser Flow Cytometer Novocyte (Agilent)



EQUIPMENT

Molecular Analyses

- Capillary Electrophoresis System (Agilent)
- QuantStudio 3 – Real-Time PCR System (Applied Biosystems)
- Thermal Cycler (Applied Biosystems)
- 5424R Centrifuge with Rotor (Eppendorf)
- HPLC System with Coulometric Detector (Thermo Scientific)
- F0 Baby Mammalian Cell Bioreactor (Bionet)
- UVITEC Chemiluminescence and Fluorescence Imaging System
- Spectrofluorometer



RESEARCH PROJECTS (past)

- *Functional implications of brain-enriched circular RNAs*; PI: dr Monika Piwecka; **SONATA BIS 8**
- *Non-coding RNAs at single-cell resolution in the pituitary gland and their role in the regulation of gene expression*; PI: dr Monika Piwecka; **OPUS 19**
- *Deciphering selective neuronal vulnerability using the direct profiling of degenerating neurons*; PI: dr Paweł Świtoński; **SONATA 17**
- *The influence of normal and mutant ataxin 3 on the immune system in the context of the pathogenesis of spinocerebellar ataxia type 3 (SCA3)* – PI dr Łukasz Przybył; **MINIATURA 3**
- *The use of genetic tools in experimental therapy of polyglutamine diseases*; PI prof. Marta Olejniczak; **SONATA BIS 5**
- *The characteristics of the regulatory RNAs landscape in glioblastoma multiforme (GBM). Circular RNAs and micro RNA-like molecules as new players in gliomagenesis and GBM progression and their importance for glioblastoma stem cells*; PI prof. Katarzyna Rolle; **SONATA BIS 7**
- *Anti-aging properties of 4-N-furfurylocytosine in age-differentiated eukaryotic cells, budding yeast and mouse model of aging*; PI prof. Eliza Wyszko; **OPUS 13**
- *Comprehensive analysis of the therapeutic potential of oligonucleotides for the treatment of polyglutamine diseases*; PI prof. Agnieszka Fiszer; **SONATA 9**
- *Psychedelics as Therapeutic Candidates in Neurodegenerative Disorders Treatment– a Study in Spinocerebellar Ataxia Type 3 Mouse Model*; PI dr Urszula Kozłowska; **SONATINA 5**
- *The novel role of STAT1 in Vascular Smooth Muscle Cell and Macrophage common and –specific transcriptional responses that reflect onset and progression of atherosclerosis*; (cooperation with Adam Mickiewicz University) – PI prof. Johannes Bluysen; **OPUS 19**
- *Dietary sources of salicylates and placental angiogenesis disorders in preeclampsia*; cooperation with the Poznań University of Life Sciences; PI prof. Joanna Suliburska; **OPUS 22**

RESEARCH PROJECTS (present)

- *Development of a universal fast-response platform, based on RNA technology, ensuring the national drug and epidemiological safety* (Consortium leader: Polfa S.A., PI: prof. M. Figlerowicz) **ABM**
- *Testing a therapeutic strategy to restore SMN1 gene expression in human motor neurons*; PI: dr Magdalena Surdyka; **MINIATURA 8**
- *Energy sources in glioblastoma organoids: Mapping the location and activity of mitochondria under varying oxygen conditions*; PI dr Konrad Kuczyński; **MINIATURA 8**
- *Input of the structure of influenza A virus RNA on regulation of virus proliferation. High throughput screening of small molecules towards inhibition of influenza virus replication*. PI: prof. Elżbieta Kierzek; **OPUS 20**
- *Evaluation of the anti-cancer activity of liposomal nanoformulations of cannabidiol and celecoxib and their combination in a glioblastoma multiforme model*; PI: prof. Violetta Krajka-Kuźniak; **PRELUDIUM BIS**
- *The complex nature of multi-domain proteins: on the trail of human Dicer ribonuclease activity – expect the unexpected*; PI: prof. Anna Kurzyńska-Kokorniak; **OPUS 28**
- *Utilization of an original genetic modification method for iPSC cells to improve universal, immunologically compatible somatic cells for therapeutic and research purposes*; PI: prof. Piotr Rieske; **ABM**
- *Function and dysfunction of repeat tracts in non-coding transcripts and protein-coding transcripts*. PI: prof. Agnieszka Fiszer; **OPUS 21**
- *MicroRNA and computational tools for the diagnosis and treatment of Alzheimer's disease and dementia*. PI: prof. Agnieszka Fiszer; **JPND 2023**
- *High-throughput screening assays for the selection of small-molecule chemical compounds that attenuate the pathogenesis of myotonic dystrophy type 2 (DM2)*. PI: prof. Marzena Wojciechowska; **OPUS 20**

RESEARCH PROJECTS (future)

Granted:

- *Functional or not? Studying positionally conserved vertebrate long noncoding RNA orthologues at subcellular resolution;* PI: dr hab. Barbara Uszczyńska-Ratajczak; **SONATA BIS 11**
- *Jump into action with a bang: Investigating the principles of long non-coding RNA import into mitochondria and its biological significance;* PI: dr hab. Barbara Uszczyńska-Ratajczak; **OPUS 27**
- *Antiviral strategies targeting RNA: Peptide nucleic acids (PNA) forming triplexes and their conjugates with low molecular weight ligands specific to conserved structural motifs of influenza A virus RNA and SARS-CoV-2;* PI: prof. Elżbieta Kierzek; **OPUS 21**
- *Dynamic RNA structures, including pseudoknots and G-quadruplexes of influenza A virus, as target objects in designing novel peptide nucleic acids for inhibition and modulation of virus replication;* PI: prof. Elżbieta Kierzek; **SHENG 4**
- *Design and Development of Serine Hydroxymethyltransferase-2 (SHMT2) Inhibitors Blocking Tumor Growth;* PI: dr hab. Miłosz Ruszkowski; **SONATA BIS 13**
- *From third ventricle to pituitary gland: regulatory RNA networks in post-transcriptional modulation of gene expression in neurosecretion;* PI: dr Monika Piwecka; **OPUS-LAP 24**
- *Identifying changes in Purkinje cell chromatin dynamics as novel drivers of neuronal vulnerability in spinocerebellar ataxias;* PI: dr Paweł Świtoński; **OPUS 29**

Under revision:

- *Development of technology based on parallelized microfluidic systems for cascade filtration of animal cells in continuous perfusion culture on an industrial scale;* PI (in consortium): dr Łukasz Przybył; **SMART PATH**
- *Recombinant protein engineering with a focus on functional and cellular characterization of bioactive fragments;* PI dr Łukasz Przybył; **BWZ**

To be submitted soon:

- *Stimulation of the endocannabinoid system reduces the severity of symptoms in post-traumatic stress disorder (PTSD).* PI (in consortium): dr Łukasz Przybył; **LUKE 1**

IBCH PARTNERS



Department of
Ribonucleoprotein
Biochemistry

Head of Department:
Prof. Anna Kurzyńska-Kokorniak



Department of Neuronal
Cell Biology

Head of Department:
Dr. Paweł Świtoński



Department of Molecular
and Systems Biology

Head of Department:
Prof. Marek Figlerowicz



Department of
Computational Biology of
Non-coding RNA

Head of Department:
Prof. Barbara Uszczyńska-Ratajczak



Department of Medical
Biotechnology

Head of Department:
Prof. Agnieszka Fiszer



Department of Structural
Biology of Eukaryotes

Head of Department:
Prof. Miłosz Ruszkowski



Department of
Biopolymer Chemistry

Head of Department:
Prof. Marcin K. Chmielewski



Department of Rare
Diseases

Head of Department:
Prof. Marzena Wojciechowska



Department of Plant
Molecular Physiology

Head of Department:
Prof. Michał Jasiński



Department of RNA
Structural Genomics

Head of Department:
Prof. Elżbieta Kierzek



Department of Genome
Engineering

Head of Department:
Prof. Marta Olejniczak



Department of Non-
coding RNAs

Head of Department:
Dr. Monika Piwecka



Department of Molecular
Neurooncology

Head of Department:
Prof. Katarzyna Rolle



Department of Biomedical
Proteomics

Head of Department:
Prof. Magdalena Łuczak



Department of Molecular
Virology

Head of Department:
Dr. Paweł Zmora

26/03/2026



Laboratory of Subcellular
Structures Analyses

Head of Laboratory
Prof. Eliza Wysoko



Protein Engineering and
Biophysics Laboratory

Head of Laboratory
Prof. Anna Urbanowicz

15/28 Departments
2/13 Laboratories

Łukasz Przybył, PhD

Laboratory of Mammalian Model Organisms

26

NATIONAL



Katedra Żywnienia Człowieka i Dietetyki
Wydział Nauk o Żywności i Żywieniu Uniwersytetu Przyrodniczego w Poznaniu

prof. dr hab. Joanna Suliburska



prof. dr hab. Paweł Kołodziejski



prof. dr hab. Johannes Bluysen



prof. dr hab. Ewa Ożegowska-Wender



prof. dr hab. Violetta Krajka-Kuźniak

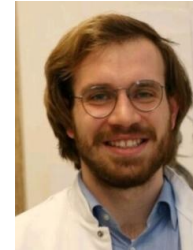
INTERNATIONAL



prof. dr hab. Sofia Forslund



dr hab. Julian Hellmann-Regen



dr Hendrik Bartolomaeus



dr Volodymyr Chernyshenko



dr Ryan Rego

COMPANIES



dr Monika Tomecka



prof. dr hab. Piotr Rieske

PUBLICATIONS

Nowaczyk M, **Kuczynski K, Przybyl L**, Olejniczak M Challenges in visualizing endogenous loci in the human genome using CRISPR imaging systems. **Biotechnologia** 2026

Suliburska J, Cholik RS, Karaźniewicz-Łada M, **Wronka D, Karlik A**, Waśkiewicz A, Skrypnik K, Kołodziejski P, Cieslak A, **Przybyl L**; Impact of dietary salicylates and aspirin on angiogenic factors and biochemical parameters in a rat model of preeclampsia **PLoS One.** 2025; **IF:3,2**

Surdyka M[#], Kalinowska-Pośka Ż[#], Niewiadomska-Cimicka A, Jesion E, Fiszer A, Singer-Mikosch E, Fievet L, **Przybyl L**, Caron NS, Hayden MR, Nguyen HP, Trottier Y, Figiel M CAG-targeted brain-permeable therapy tested in biallelic humanized polyQ mouse models **Molecular Therapy Nucl. Acids**, 2025; **IF:6,3**

Latowska-Łysiak J, Zarębska Ż, Sajek MP, Grabowska A, Buratin A, Głodowicz P, Misiorek JO, **Kuczyński K**, Bortoluzzi S, Żywicki M, Kosiński JG, Rybak-Wolf A, Piestrzeniewicz R, Barciszewska AM, Rolle K. Transcriptome-wide analysis of circRNA and RBP profiles and their molecular relevance for GBM **Mol Oncol.** 2025; **IF: 4,51**

Sztachera M, Wendlandt-Stanek W, Serwa RA, Stanaszek L, Smuszkiewicz M, **Wronka D**, Piwecka M. Interrogation of RNA-bound proteome with XRNAX illuminates molecular alterations in the mouse brain affected with dysmyelination **Cell Rep.** 2025; **IF:6,9**

Antonczyk A, Kluzek K, Herbich N, Boroujeni M, Krist B, **Wronka D, Karlik A, Przybyl L**, Plewinski A, Wesoly J, Bluysen HAR Identification of ALEKSIN as a novel multi-IRF inhibitor of IRF- and STAT-mediated transcription in vascular inflammation and atherosclerosis **Front. Pharmacol.** 2025; **IF:5,2**

Wozna-Wysocka M*, Jazurek-Ciesiolka M*, **Przybyl L***, Wronka D, Misiorek JO, Suszynska-Zajczyk J, Figura G, Ciesiolka A, Sobieszczanska P, Zeller A., Niemira M, Switonski PM, Fiszer A Insights into RNA-mediated pathology in new mouse models of Huntington's disease **FASEB J** 2024; **IF:4,5**

Wronka D[#], Karlik A[#], Misiorek J, **Przybyl L** What the gut tells the brain – is there a link between microbiota and Huntington's disease? **Int J Mol Sci** 2023 **IF:5,7**

Kotowska-Zimmer A, **Przybyl L**, Pewinska M, Suszynska-Zajczyk J, **Wronka D**, Figiel M, and Olejniczak M A CAG repeat-targeting artificial miRNA lowers the mutant huntingtin level in the YAC128 model of Huntington's disease. **Molecular Therapy Nucl. Acids**, 2022 May 5;28:702-715. **IF:6,3**

Majchrzak-Celińska A, Misiorek J, Kruhlenia N, **Przybyl L.**, Kleszcz R, Rolle K, Krajka-Kuźniak V. COXIBs and 2,5-dimethylcelecoxib counteract the hyperactivated Wnt/ β -catenin pathway and COX-2/PGE2/EP4 signaling in glioblastoma cells **BMC Cancer** 2021 Apr. **IF:3,7**

Przybyl L, Wozna-Wysocka M, Kozłowska E, Fiszer A. What, When and How to Measure-Peripheral Biomarkers in Therapy of Huntington's Disease. **Int J Mol Sci** 2021 Feb 4. **IF:5,7**

PUBLICATIONS (submitted / in preparation)

Rybarczyk A, Majchrzak-Celińska A, Piwowarczyk L, Tomczak S, **Wronka D, Karlik A, Przybyl L**, and Krajka-Kuźniak V Liposomal Co-Delivery of Cannabidiol and Celecoxib Targets Redox and Inflammatory Signaling in Experimental Glioblastoma. *submitted to Antioxidants*

Kozłowska U, Suszyska-Zajczyk J, **Karlik A, Przybyl L**, Surdyka M, Samelak-Czajka A, Zimna A, Rassek K, Chmurzynska A, Wojciechowski P, Podkowiński J, Marcinkowska-Swojak M, Handschuh L, Hogendorf A, Palner M, Gregerson F, Zalewski T, Nichols C Chronic psilocybin treatment mitigates neuroinflammation, improves brain clearance, and restores circadian gene regulation in a transgenic mouse model of Alzheimer's disease *submitted to Alzheimer's & Dementia: The Journal of the Alzheimer's Association*

Pewinska-Kolodziejczak M, Kotowska-Zimmer A, **Przybyl L, Wronka D, Karlik A**, Smuszkiewicz M, Balcerk J, Suszyska-Zajczyk J, Piaszyk-Borychowska A, Urbanek-Trzeciak M, Sablok G, Kozłowska E, Podkowinski J, Fiszer A, Kozłowski P, Handschuh L, Olejniczak M Optimized CAG-targeting artificial microRNAs demonstrate high efficacy and specificity in cellular and mouse models of polyglutamine disorders *submitted to NAR Molecular Medicine*

Fedoruk-Wyszomirska A, Pawelczak P, Orlicka-Płocka M, Gurda D, Giel-Pietraszuk M, **Przybyl L**, Framski G, Pasternak K, Chmurzyńska A, Wyszko E 4-N-Furfurylcytosine, a Novel Cytosine-Derived Modulator of Mitochondrial Homeostasis and Redox Balance to Counteract Aging: Insights from Cellular and Mouse Models *submitted to Free Radical Biology and Medicine*

Kumar M, Halami PM, Peddha MS, **Wronka D**, Geisberger S, Rauch A, Anders W, **Karlik A**, Bartolomaeus TUP, Löber U, Wilck N, Kempa S, Haghikia A, Forslund SK, Markó L, **Przybyl L** Synbiotics Reduce Hypercholesterolemia and Aortic Inflammation via Modulation of Cholesterol Metabolism and T Cells *in preparation*

Misiorek JO, Zarębska Z, **Kuczyński K**, Latowska-Łysiak J, Grabowska A, Głodowicz P, **Karlik A, Wronka D**, Sajek M, Barciszewska AM, **Przybyl L**, Rolle K; Circular RNA - circCLIP2 is predominantly expressed in GSC niche and enhances glioblastoma aggressiveness via EMT and ECM signaling *in preparation*

Kordys M, **Surdyka M**, Trybus M, Urbanowicz A, Swiatkowska A Engineering Translation Efficiency: Synergistic Effects of Laminin and EMCV 5'UTRs with N1-methylpseudouridine in therapeutic RNA Design *in preparation*

Latowska-Łysiak J, Grabowska A, Di Timoteo G, Glogovitis I, Głodowicz P, Gaffo E, Bortoluzzi S, **Kuczyński K**, Sajek M, Serwa R, Stadnik D. D, Zarębska Ż, **Wronka D, Karlik A, Przybyl L**, Rolle K Tangled fates: exploring the interplay of ATXN10 circular and linear transcripts and their impact on glioblastoma development. *in preparation*

Grabowska A, Latowska-Łysiak J, Głodowicz P, **Kuczyński K**, Gadgil A, Zasoński G, Żywicki M, Kujawska J, Piestrzeniewicz R, Barciszewska AM, Raczyńska KD, Rolle K New insight into sno-derived RNAs in glioblastoma. Potential hypoxia-dependent involvement of FUS in the processing of SNORA77 into sdRNA 1 707-5p *in preparation*

PAST

> 15.000 mice

21 mouse colonies

> 30 people from IBCH administered in animal facility

> 60 applications to Local Ethics Committee

FUTURE

Myocardial infarction

***In vitro* fertilization/embryo transfer**

Germ-free mice

Dedicated immunophenotyping for rats and human

***In vitro* model of blood-brain barrier**

M1/M2 polarisation of macrophages

***Ex vivo* models: Acute brain slices and Precision-cut Lung Slices**

Suppression assay

Good Laboratory Practice

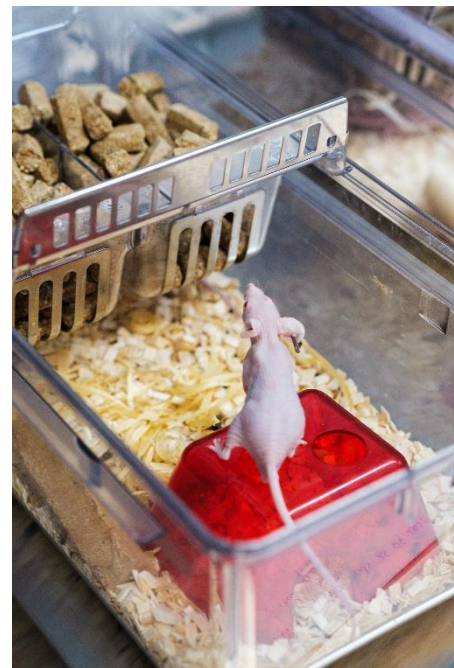
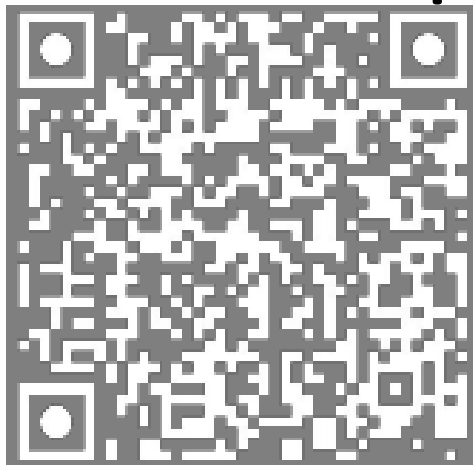


Thank you for your attention!



Laboratory of
Mammalian Model Organisms

Visit our web page!





NMR Laboratory



Department of Biomolecular NMR

Presentation of IChB Laboratories, March 26th, 2026

History



- NMR Laboratory was established in 1979 and was led by prof. Zofia Gdaniec until 2018 (under the supervision of prof. R. Adamiak / prof. R. Kierzek)
The longest-established laboratory at IChB – **47** years of activity
- JEOL FX 90Q
- JEOL 300 MHz spectrometer, operated for 30 years. The original magnet can still be seen in Building B



JNM-FX90Q
90MHz Integrated Broadband DQD FT NMR



Staff



mgr Anna Teubert



dr Karolina Zielińska



dr Karol Pasternak
Head



dr Daniel Baranowski

Equipment



- ❑ Spectrometer NMR 400 MHz, AVANCE II, Bruker (2005)
- ❑ Spectrometer NMR 500 MHz, AVANCE III, Bruker (2011)
- ❑ Spectrometer NMR 700 MHz, AVANCE III, Bruker (2011)



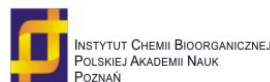
- ❑ Circular Dichroism (CD) spectropolarimeter J-815S, JASCO
- ❑ Spectrophotometer UV-VIS , V-650, JASCO



- ❑ HPLC Agilent Tech 1260 Infinity



Agilent Technologies



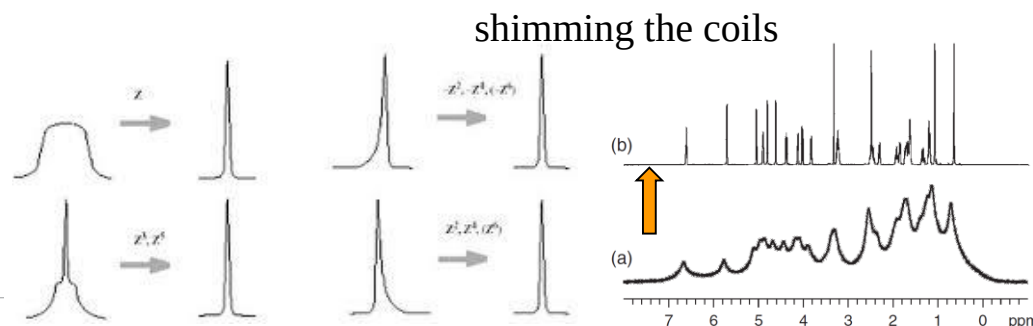
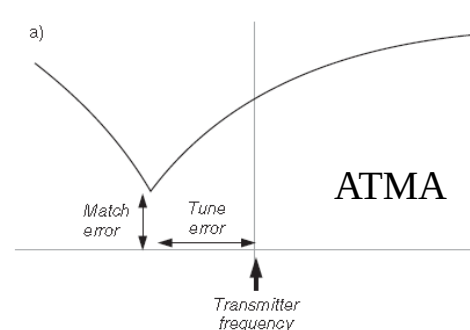
„Zwiększenie potencjału badawczego Instytutu Chemii Bioorganicznej PAN w zakresie analizy strukturalnej biomolekuł metodami NMR i krytalografii”

Spectrometer NMR 400 MHz



- Two **RF** (Radio Frequency) channels
- BBO** (broadband probe) ^{31}P - ^{109}Ag / ^1H -D for a wide range of 1D and 2D experiments
- ATMA** – *Automatic Tuning and Matching* system
- TOPSHIM** – a fully automatic coil-shimming routine that optimizes magnetic field homogeneity for each sample and ensures high-quality spectra

400 MHz is accessible to Institute employees and PhD candidates upon completion of the mandatory training.



Spectrometer NMR 500 MHz



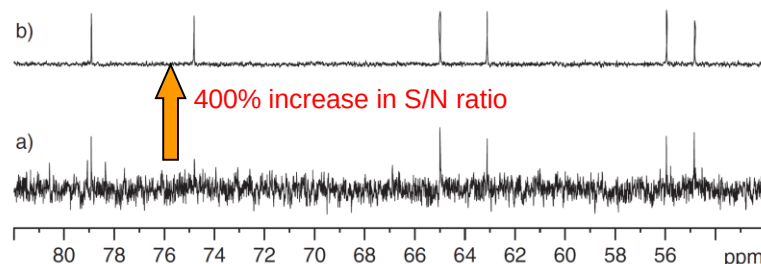
- ❑ Three **RF** channels enabling the acquisition of 3D H–C–N correlation experiments
- ❑ **BBO** (broadband probe) ^{31}P - $^{109}\text{Ag}/^1\text{H}$ -D
- ❑ **TXI** (triple resonance probe) ^1H - $^{13}\text{C}/^{15}\text{N}$, -D; ^1H - $^{13}\text{C}/^{31}\text{P}$, -D
- ❑ **ATMA and TOPSHIM**
- ❑ **Autosampler** enabling fully automated acquisition of up to 120 samples, controlled via ICON-NMR software
- ❑ 500 MHz is available to all Institute employees for more demanding or complex experiments.



Spectrometer NMR 700 MHz



- ❑ **Quadruple Resonance CryoProbe™**
Four RF channels of this probe enable simultaneous decoupling on multiple nuclei such as ^{13}C , ^{31}P and ^{15}N
- ❑ **ATMA, TOPSHIM**
- ❑ **SampleCase™** 24 sample changer controlled via ICON NMR
- ❑ The observation coils for ^1H and ^{13}C are cooled with helium gas to $-253\text{ }^\circ\text{C}$. This results in 400% increase in the signal-to-noise ratio for both nuclei compared with a standard room-temperature probe. A 400% increase in S/N means that experiments can be completed in 1/16 of the time required with a standard probe, or performed on samples at four-fold lower concentration.
- ❑ It is ideally suited to research on **RNA, DNA, proteins, small molecules, and metabolomic samples.**



NMR SOFTWARE



TopSpin (ver 4.x or 5.0) by BRUKER is recommended software

A free academic license is available for download at the following link:

<https://www.bruker.com/en/products-and-solutions/mr/nmr-software/topspin.html>

Equipment



Circular Dichroism (CD) spectropolarimeter J-815S

- ❑ Variable wavelength and variable temperature measurements
- ❑ Wavelength Range: 163 – 900 nm (CD, ORD, fluorescence)
- ❑ Peltier Temperature Control: 4°C – 95°C
- ❑ Characterization of nucleic acid/protein secondary structure
- ❑ Detection of structural changes due to mutagenesis
- ❑ Conformational stability in response to changes in: temperature, pH, denaturant concentration or buffer composition



Spectrophotometer UV VIS Jasco V-650

- ❑ Wavelength range: 190-900 nm
- ❑ Photometric range: up to +4 Abs
- ❑ Programmable temperature control: 4°–95°C
- ❑ Automated cell changers
- ❑ DNA/RNA melting measurements



HPLC Agilent Tech 1260 Infinity

- ❑ Purification of nucleic acids on analytical and semi-preparative scale;
- ❑ Characterization of purity of nucleic acids, nucleotides, organic compounds



Reservation system



Instytut Chemii Bioorganicznej PAN
System rezerwacji sprzętu i pomieszczeń

06.02.2024 Idź do Pomoc Pokoje Raport Szukaj kalendarz Wyloguj

Styl:
Bud A - Prac. Analizy Pol. Kom.
Budynek A - Prac. Inz. Biologii
Building B - NMR Laboratory
Budynek E - 010
serwis NMR
Willa B10 - room 11
Willa B12
Willa B12 - PASS

styczeń 2024 luty 2024 marzec 2024

wtorek 06 luty 2024

<< Idź do dnia przed Idź do dnia dzisiejszego Idź do dnia po >>

08:00	NMR 400MHz (1)	NMR CD (1)	NMR UV (1)
08:15			UV meltings
08:30			
08:45			
09:00			
09:15			
09:30			
09:45			
10:00	¹³ C experiment		
10:15			
10:30			
10:45			
11:00			
11:15			
11:30		Experiment	
11:45			
12:00			
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14:30			
14:45			
15:00			
15:15			
15:30			

<< Idź do dnia przed Idź do dnia dzisiejszego Idź do dnia po >>

Zewnętrzny Wewnętrzny

Zobacz Dzień: sty 31 | lut 01 | lut 02 | lut 03 | lut 04 | lut 05 | **lut 06** | lut 07 | lut 08 | lut 09 | lut 10 | lut 11 | lut 12 | lut 13
Zobacz Tydzień: sty 07 | sty 14 | sty 21 | sty 28 | **lut 04** | lut 11 | lut 18 | lut 25 | mar 03
Zobacz Miesiąc: gru 2023 | sty 2024 | **lut 2024** | mar 2024 | kwi 2024 | maj 2024 | cze 2024 | lip 2024 | sie 2024

<https://reservation.ibch.poznan.pl>

CD – Liquid nitrogen needs to be ordered for your analysis

400 MHz NMR – mandatory training with Anna Teubert (ext. 1156)

Research Support for the Institute's Departments



Structural Chemistry and Biology of Nucleic Acids

Structural Biology of Eukaryotes

Nucleic Acids Bioengineering

RNA Structural Research

Medicinal Chemistry Lab

Biopolymers Chemistry

Rare Diseases

NMR Lab

Biomolecular NMR

RNA Structural Genomics

Molecular Assays and Imaging Lab

Plant Functional Metabolomics

Molecular and Systems Biology

Chemistry of Nucleic Acid Components

Research Support for External Scientific Institutions and Companies



Poznan University of Technology; Faculty Of Chemical Technology

Gdansk University of Technology; Faculty of Chemistry

Lodz University of Technology, Faculty of Chemistry

Cracov University of Technology; Faculty of Chemical Engineering and Technology

Adam Mickiewicz University, Faculty of Chemistry

Medical University of Bialystok; Faculty of Pharmacy

Poznan University of Medical Sciences; Faculty of Pharmacy

Nicolaus Copernicus University, Collegium Medicum Faculty of Pharmacy

NanoBioMedical Centre AMU

Helioenergia, Molecure, Esmoking Institute, Biovico

NMR Laboratory Research and Service Offer



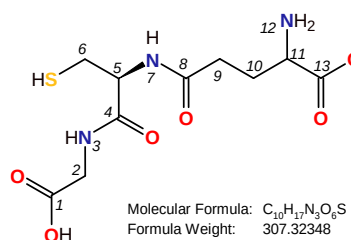
- ❑ A platform enabling NMR, CD, and UV–Vis measurements of nucleic acids, proteins, and small molecules
- ❑ Assessment of nucleic acid purity based on NMR or HPLC analyses
- ❑ Structure determination of organic compounds through the analysis of 1D and 2D NMR spectra
- ❑ Acquisition and analysis of NMR spectra from multicomponent natural samples, including herbal extracts, lyophilisates of body fluids, and cell lysates
- ❑ Spectroscopic investigation of intra- and intermolecular interactions across a wide temperature range
- ❑ Expertise provided by members of the Dept of Biomolecular NMR and the NMR Lab in experimental setup, operation, and spectral interpretation
- ❑ High-throughput and automated acquisition of 1D and 2D NMR spectra (such as COSY, HSQC, HMBC, NOESY, TOCSY et al)

Selected Examples of Research Projects Carried Out in the NMR Laboratory

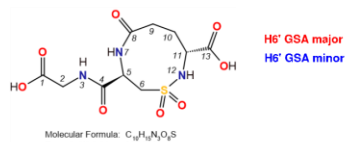


Analysis of oxidation reaction of GSH by 1D/2D NMR and HPLC

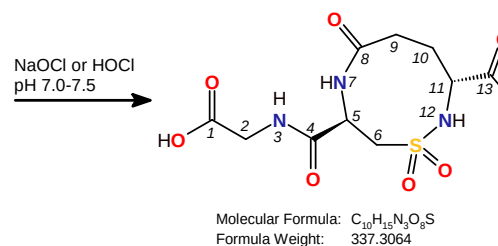
Samples from dr D. Jakubczyk



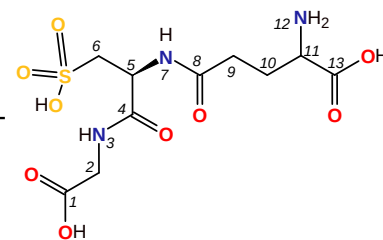
Glutathione (GSH)



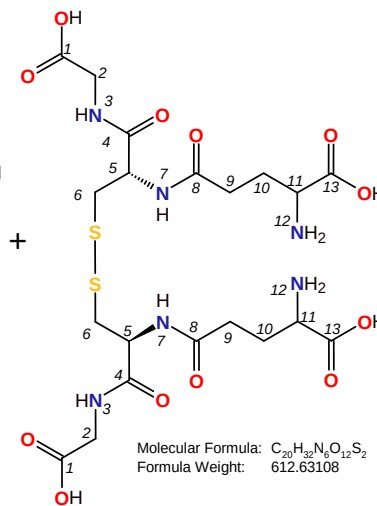
H6' GSA major
H6' GSA minor



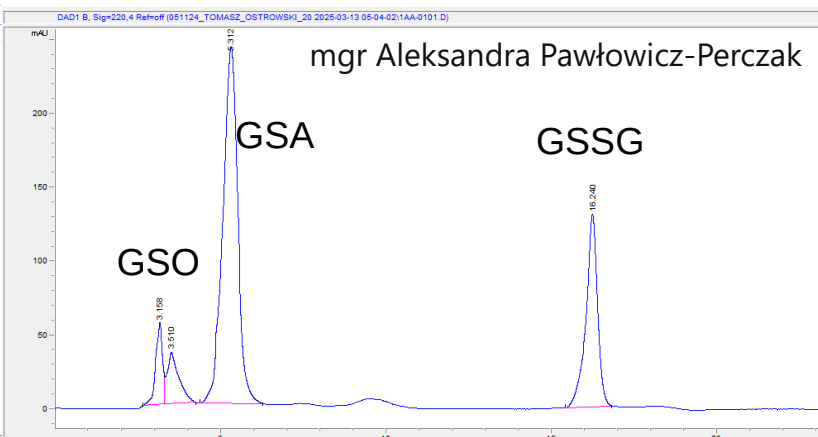
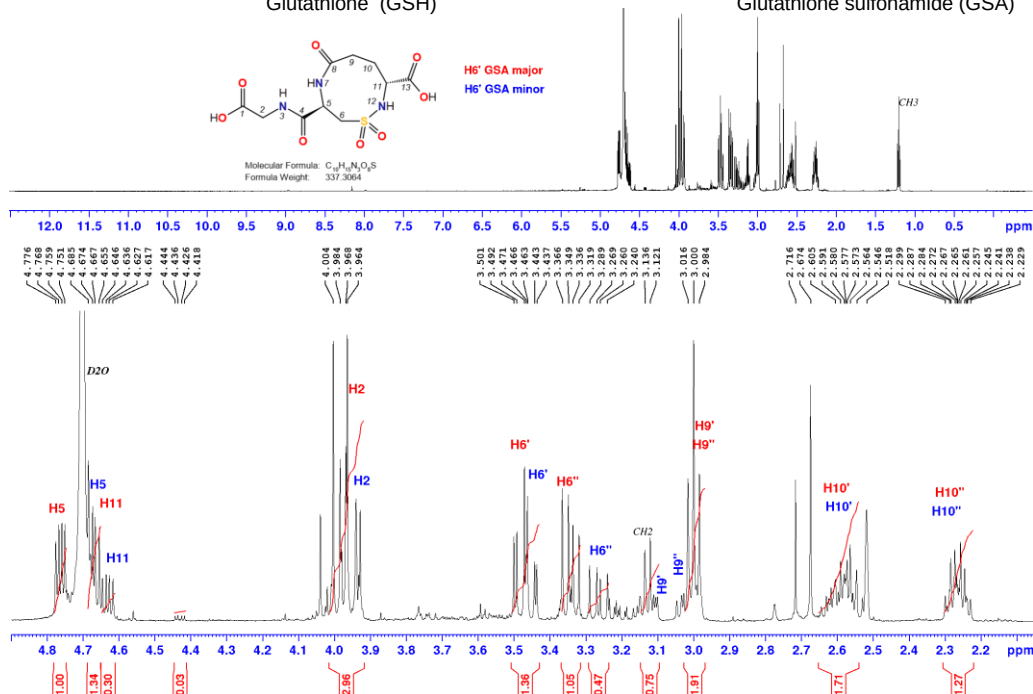
Glutathione sulfonamide (GSA)



Glutathione sulfonic acid (GSO)



Glutathione disulfide (GSSG)



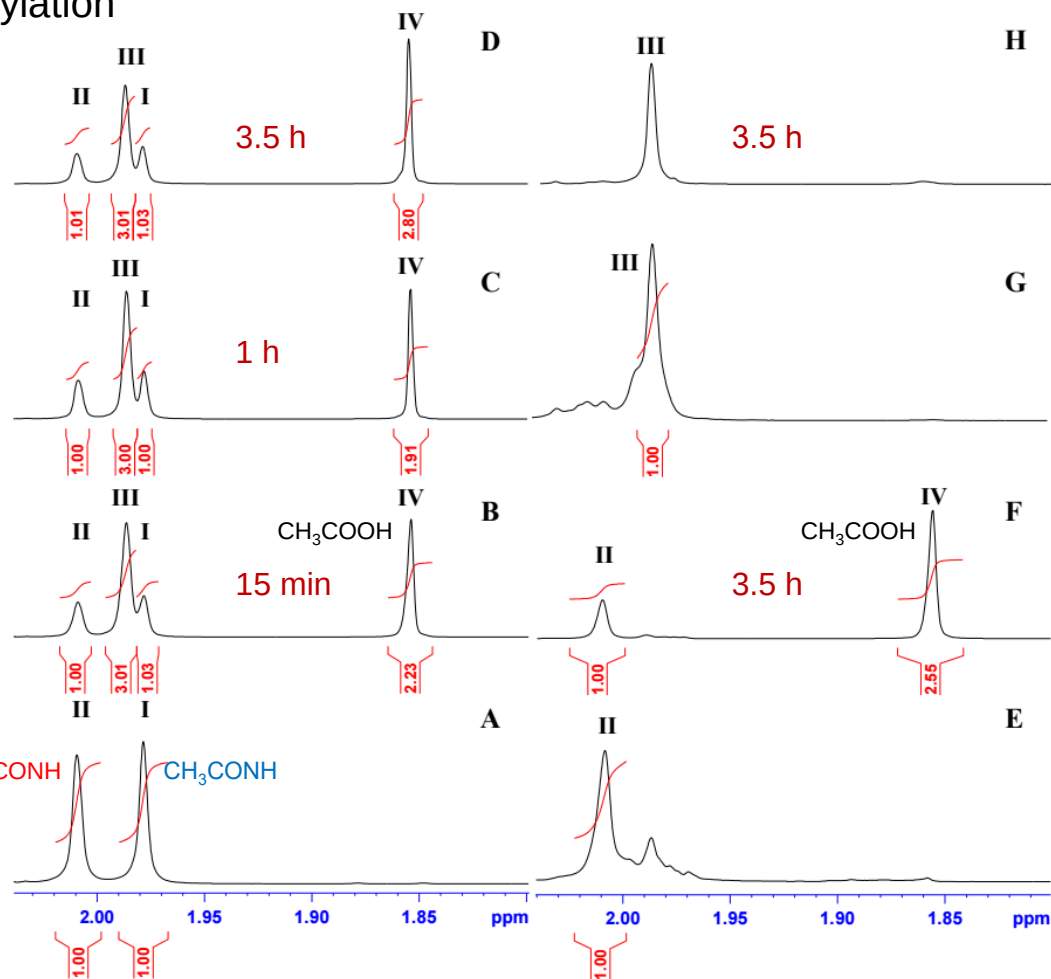
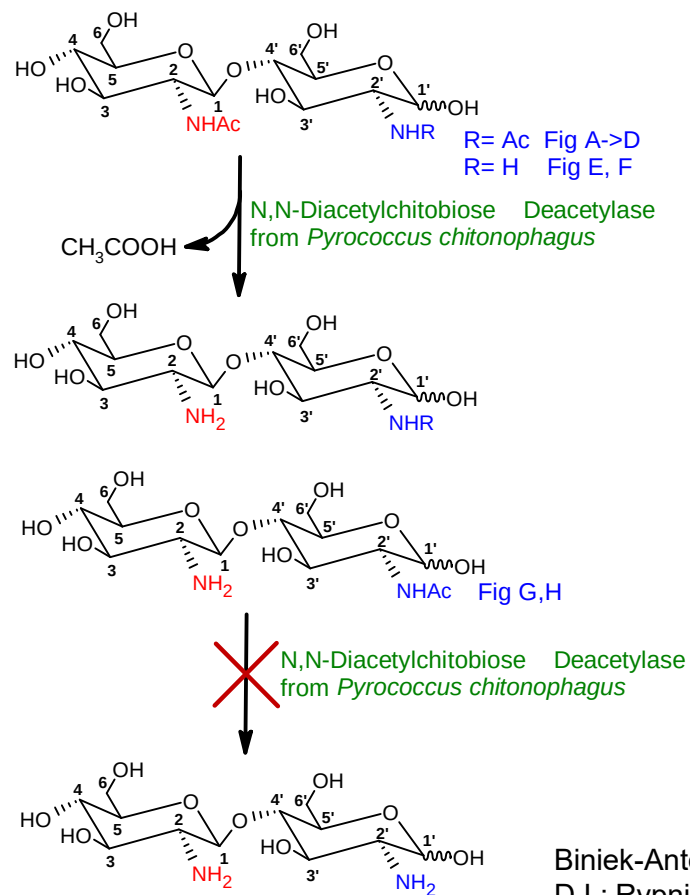
mgr Aleksandra Pawłowicz-Perczak

Selected Examples of Research Projects Carried Out in the NMR Laboratory



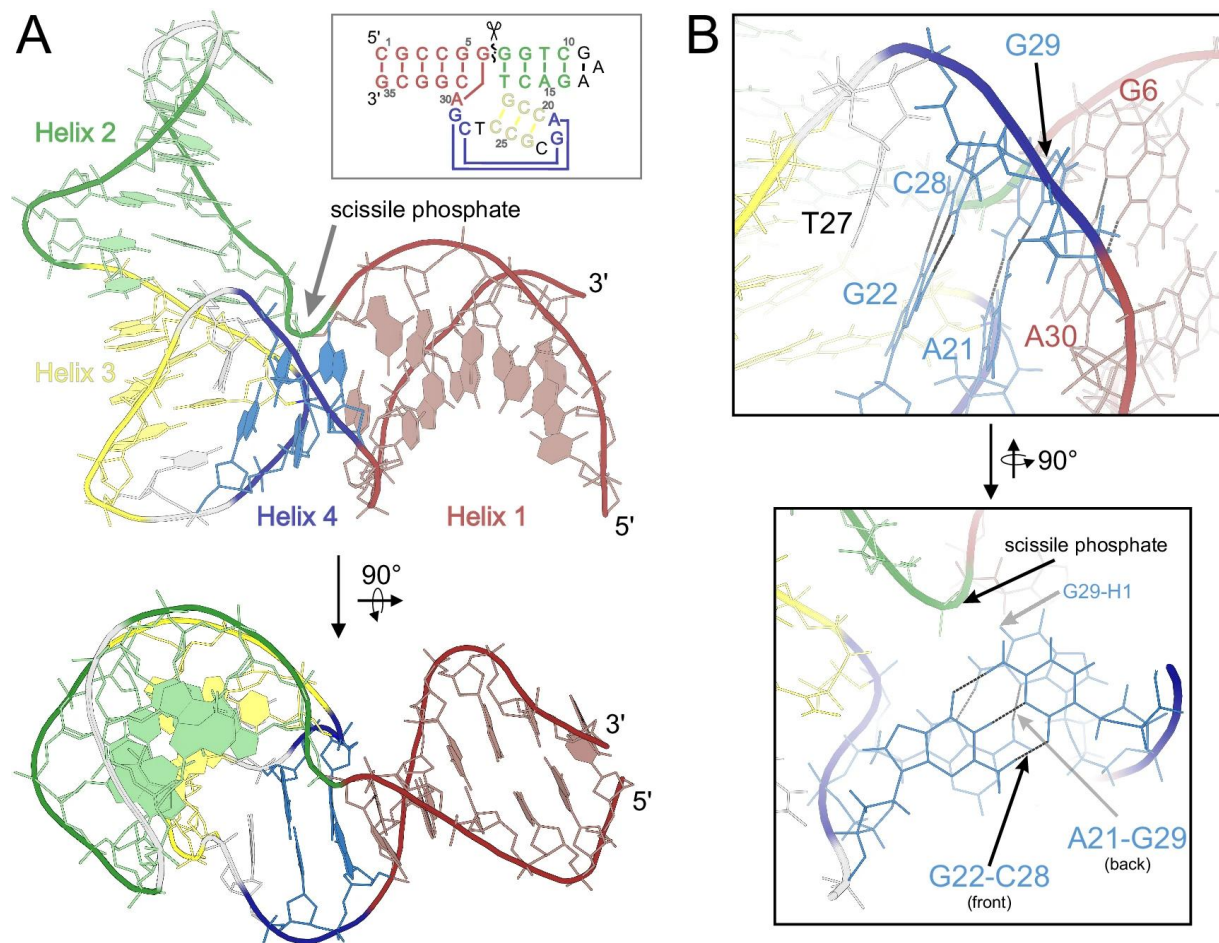
Monitoring the progress of enzymatic deacetylation of chitobiose by ^1H NMR

Samples from prof W. Rypniewski



Selected Examples of Research Projects Carried Out in the NMR Laboratory

The solution structure of 8-17 DNAzyme in the presence of Zn^{2+}



Please keep this in Mind



- **NMR is not exclusively for chemists!**
- **Your sample is recoverable after the experiment**
- **We are open to collaboration and committed to supporting research activities**

Feel free to visit us – building B

(entrance next to the first magnet at ICHB PAS)

Thank you for your attention





Laboratory of Mass Spectrometry
Institute of Bioorganic Chemistry PAS

Łukasz Marczak

Anna Wojakowska

Aleksander Strugała

Daniel Fochtman

Kamil Frąckowiak

MS systems:

**Institute of Bioorganic Chemistry (Noskowskiego), laboratories 02E,
06E, 09E, 010E, office 16E**

- nano/micro/high flow LC-MS (high resolution OrbiTrap, Thermo Exploris 480)
- GC-MS (TripleQuad, Thermo TSQ8000)
- Nano/highflow LC-MS (ion trap, Bruker Amazon SL)
- LC-MS with Ion Mobility separation (Bruker timsTOF Pro)
- MALDI-TOF (Shimadzu Axima Assurance)
- ~~—MALDI-TOF/TOF (Bruker UltrafleXtreme)~~
- ~~—LC Q-TOF MS/MS (Bruker microTOF-q)~~
- ~~—GC-TOF MS (Waters Premier GCT)~~

E-mail: pracownia.ms@ibch.poznan.pl

- Service price list available on request
- Prices for Institute employees are lower than in the case of external services
- Payments are settled through the customer's purchase of reagents and small equipment necessary for the day-to-day functioning of the laboratory

Pracownia Spektrometrii Mas (Laboratory of Mass Spectrometry)

Dane osoby zlecającej (Person ordering the analysis)

Imię i nazwisko (Name):

Zakład (Department):

Telefon (Phone):

Przedmiot zlecenia (Subject matter)	Liczba próbek (Number of samples)

Informacje dotyczące próbek (information about samples)

Symbole próbki (sample symbols):

Wzór sumaryczny (Sum formula):

Masa cząsteczkowa związku (Molecular weight):

Stan skupienia (physical state):

Rozpuszczalność (solubility):

Matryca (dla Maldi) (proposed matrix for MALDI analyses):

Uwagi (Remarks):

Wzory strukturalne (opcjonalnie) (optional structural formulas):

What we can measure?

Molecular Weight determination

Low resolution:

- MALDI – oligonucleotides, peptides, polymers etc.
- Structure elucidation (MS/MS)

High Resolution:

- Direct infusion – peptides, oligonucleotides, low MW compounds, etc.
- LC-MS on Orbitrap

Proteomic analyses

Identification of single proteins:

- From polyacrylamide gels
- From solution
- De novo sequencing

Analysis of protein modifications

Analysis of proteins in complex mixtures:

- Identification, PTMs analysis
- Identification + quantification (label free, ITRAQs, TMT, etc.)

Metabolomic analyses

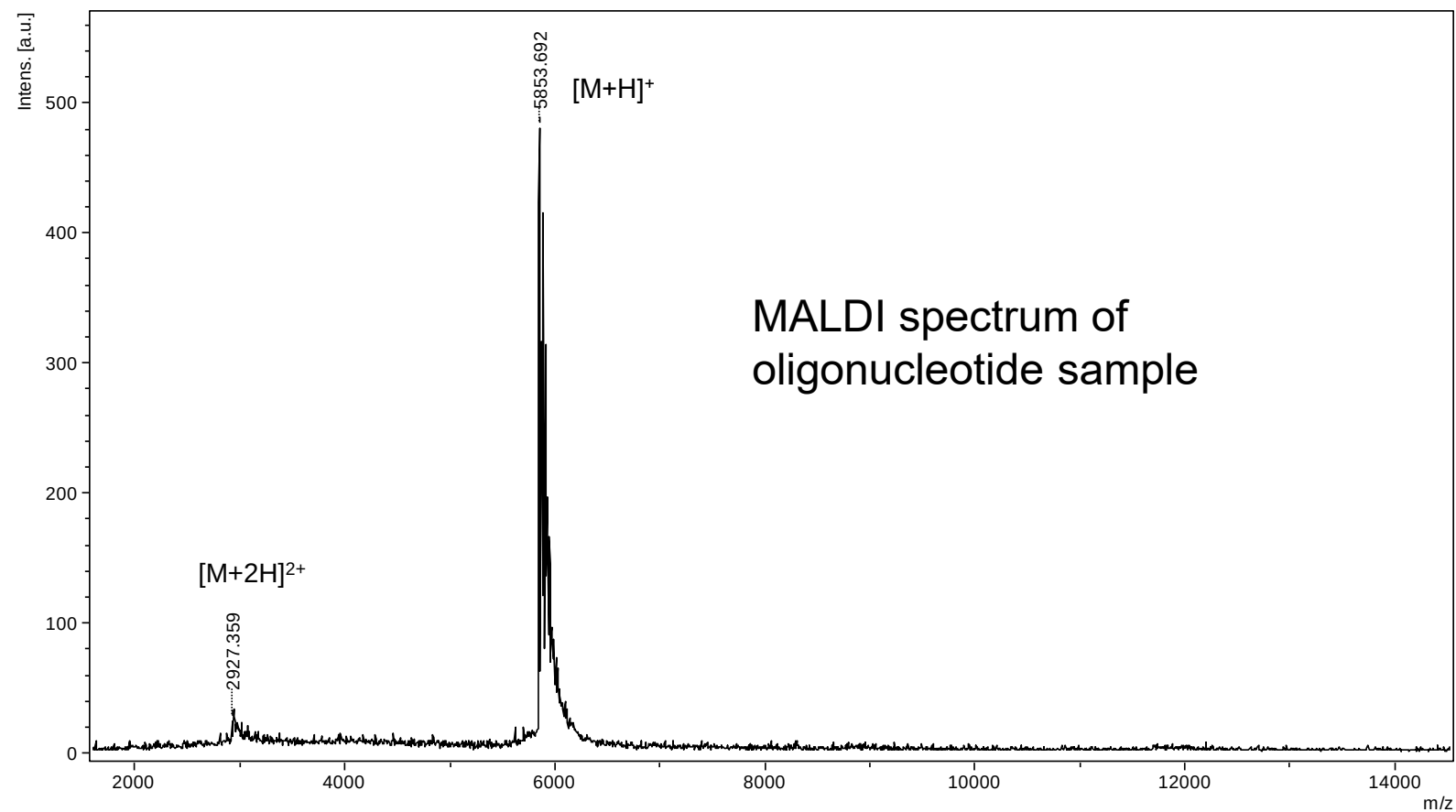
Analysis of compounds in complex mixtures - identification and quantification

- GC-MS analysis for volatile compounds (+derivatization)

- LC-MS analysis for other metabolites

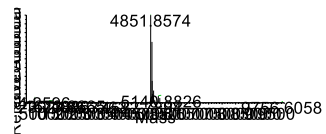
- Direct Infusion High Resolution analysis with nano source (ie. Lipids)

Molecular Weight determination



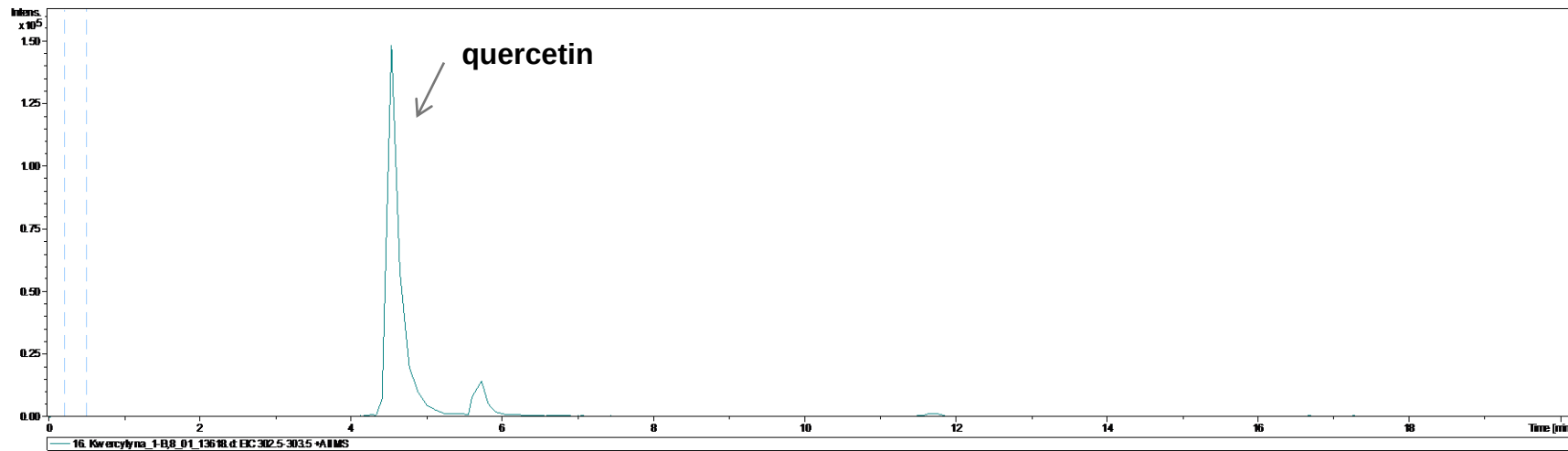
[illegible]

HRMS spectrum



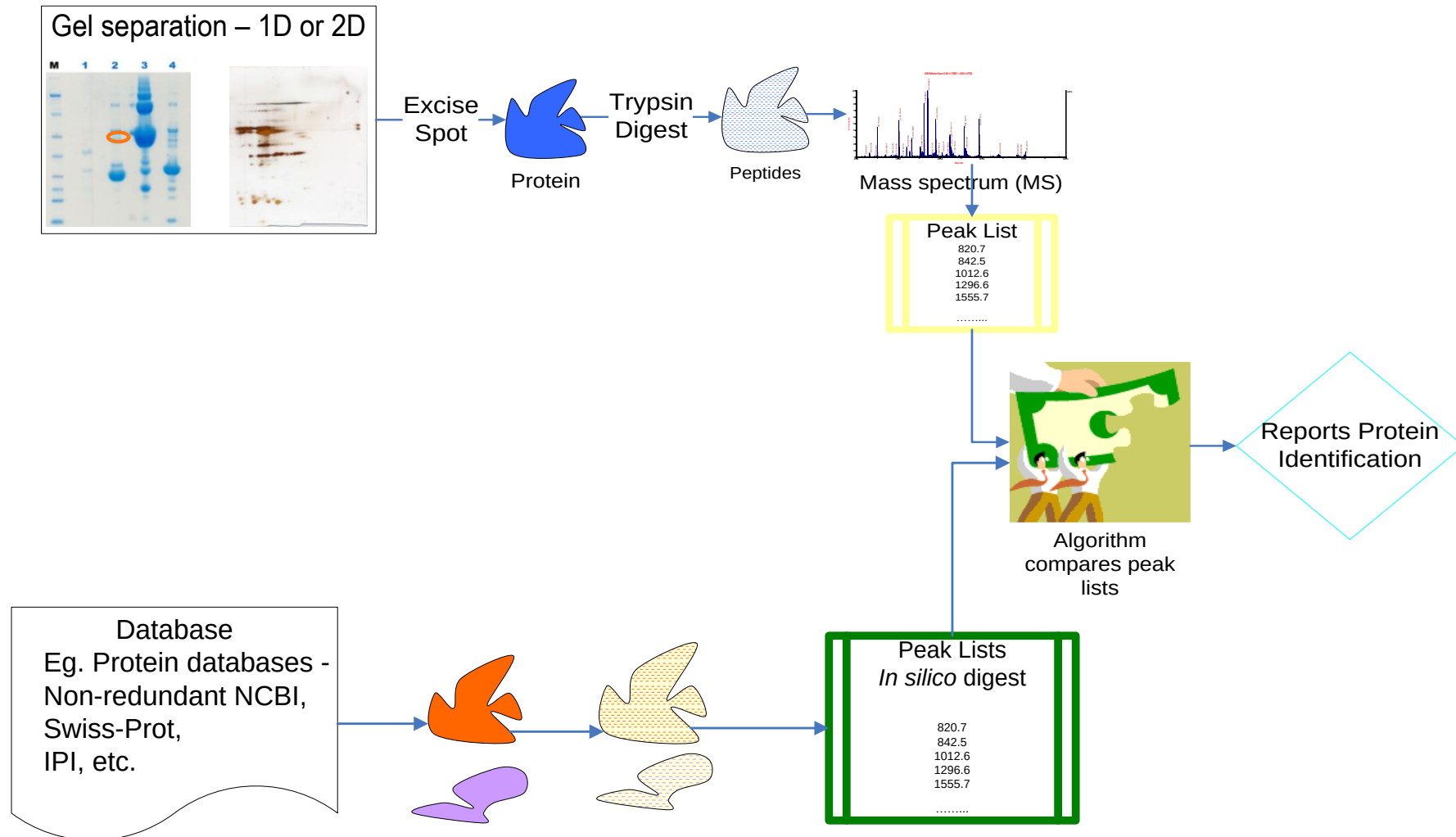
Deconvoluted HRMS spectrum

Finding specific compound using LC/MS

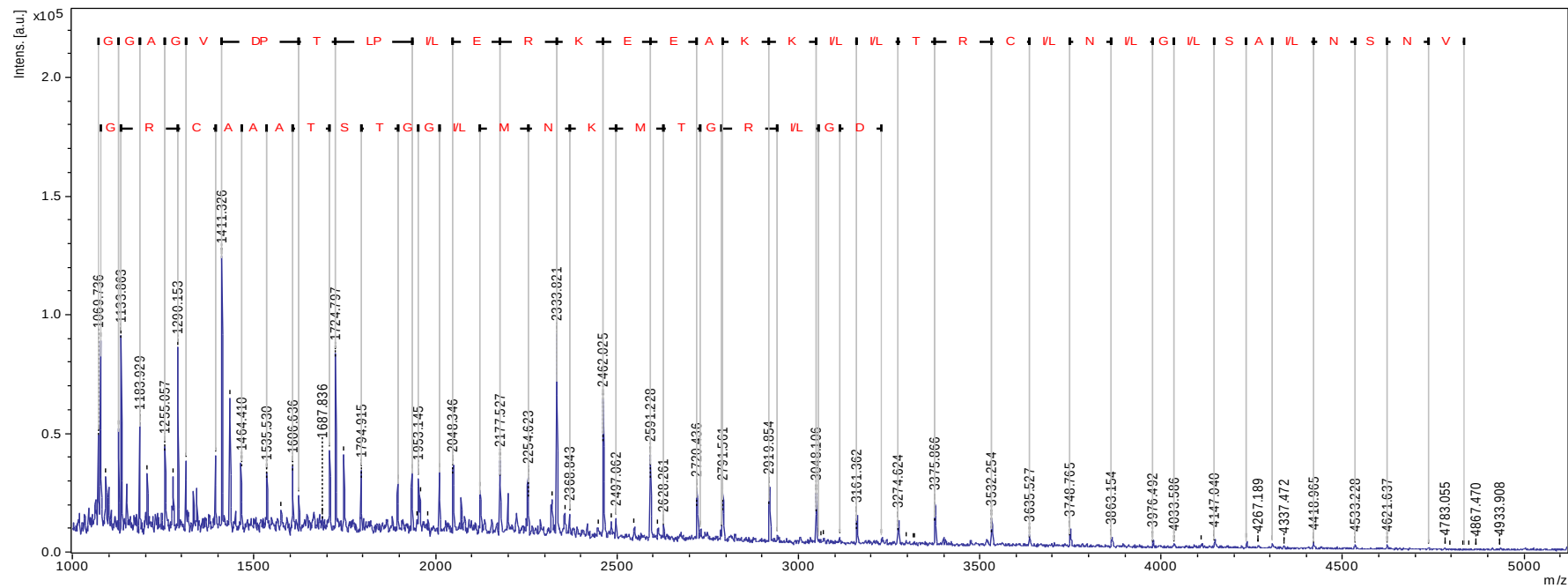
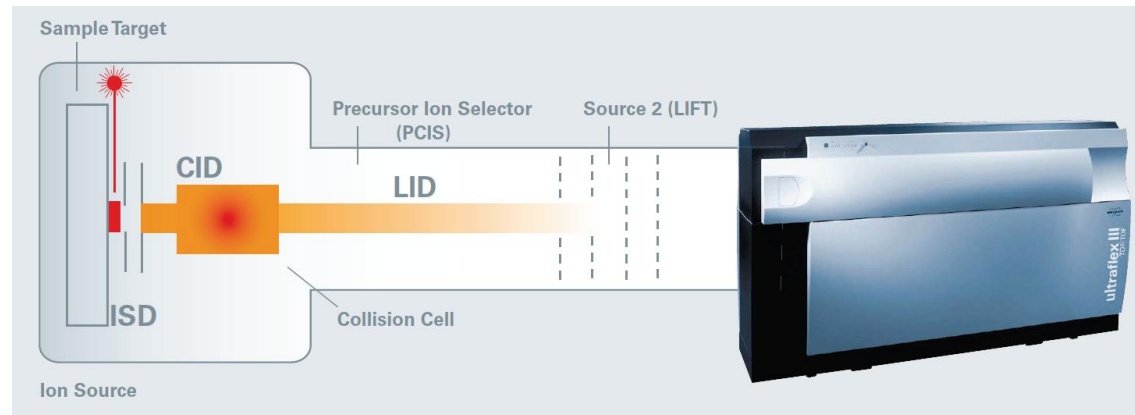


Extracted Ion Chromatogram for 303 m/z (quercetin $[M+H]^+$)

- Identification of proteins from gel bands (PMF and MS/MS)



- protein sequencing using the **In Source Decay (ISD)** method



LC-MS PROTEOMICS

Comprehensive LC-MS proteomic analyses

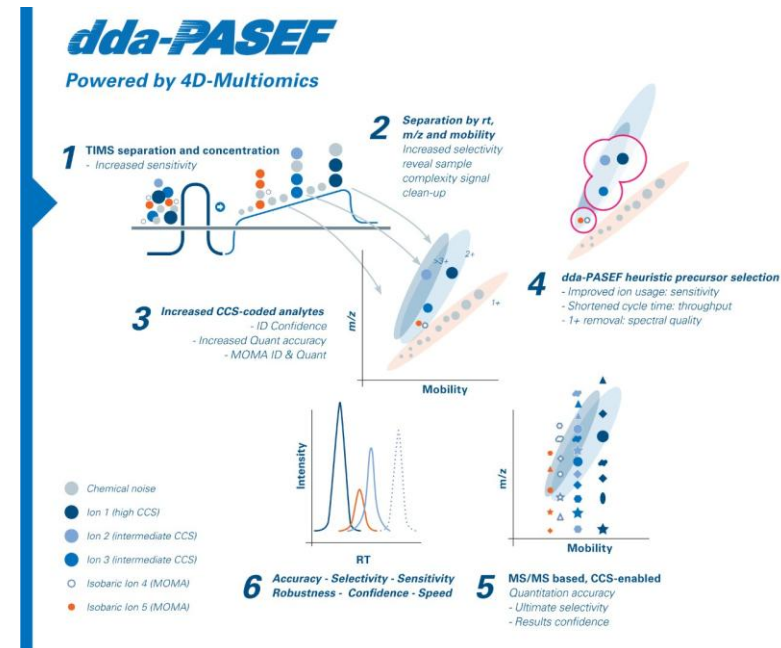
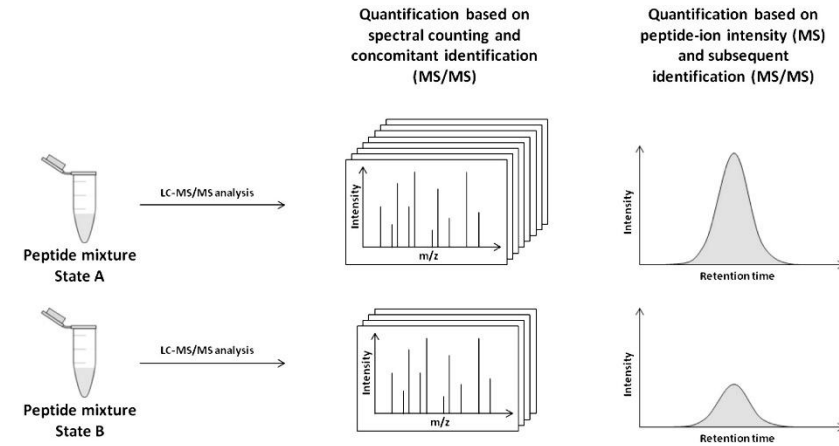
We perform all types of proteomic analyses—from discovery to targeted workflows—using DDA, DIA, and PASEF approaches on high-resolution mass spectrometers.

DDA

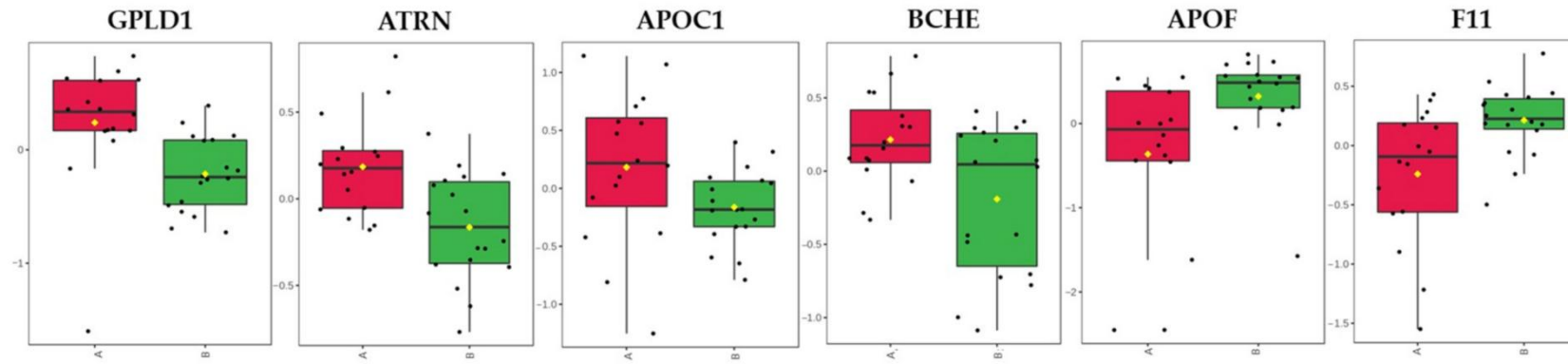
DIA

PASEF / diaPASEF

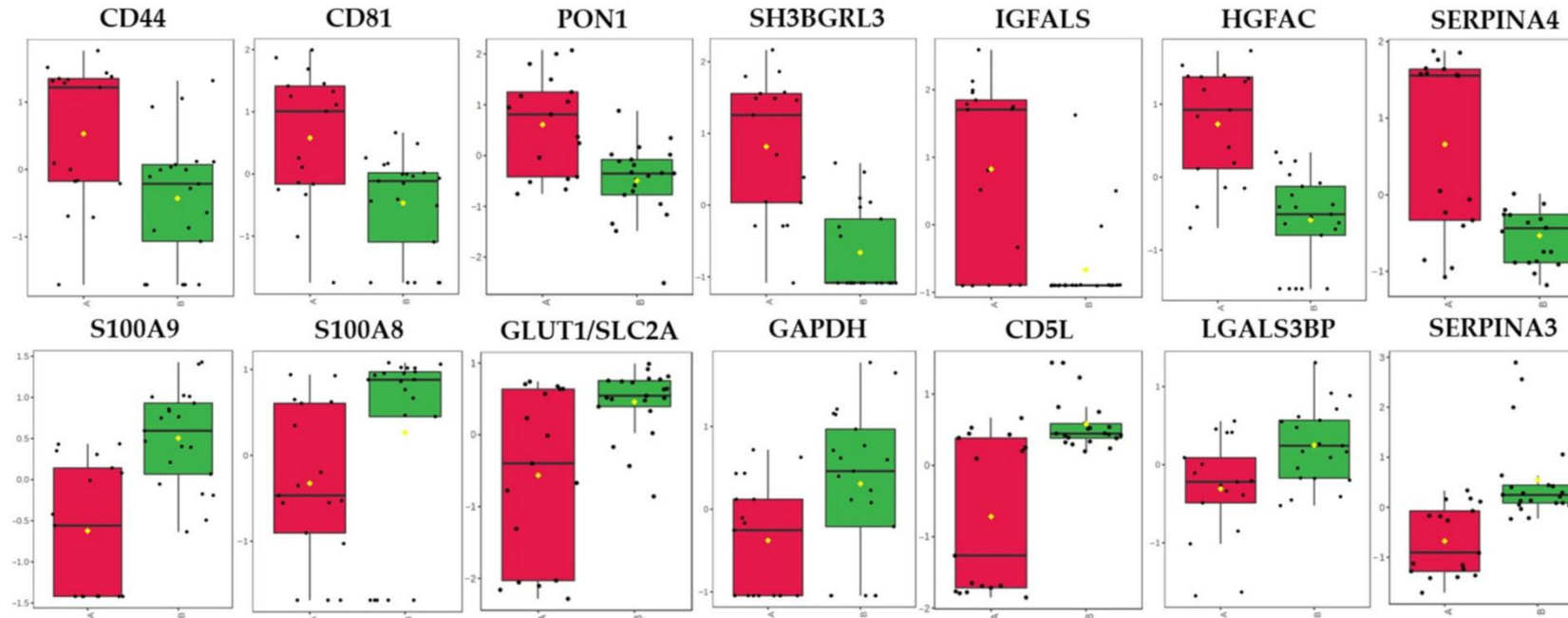
- Full analytical spectrum: discovery, quantitative, and targeted workflows for samples of varying complexity
- DDA and DIA: flexible acquisition strategies for broad profiling and precise quantification
- PASEF / diaPASEF: very high speed, sensitivity, and proteome coverage depth
- High-resolution MS platforms: Orbitrap and TOF systems for reliable identification and quantitative analysis

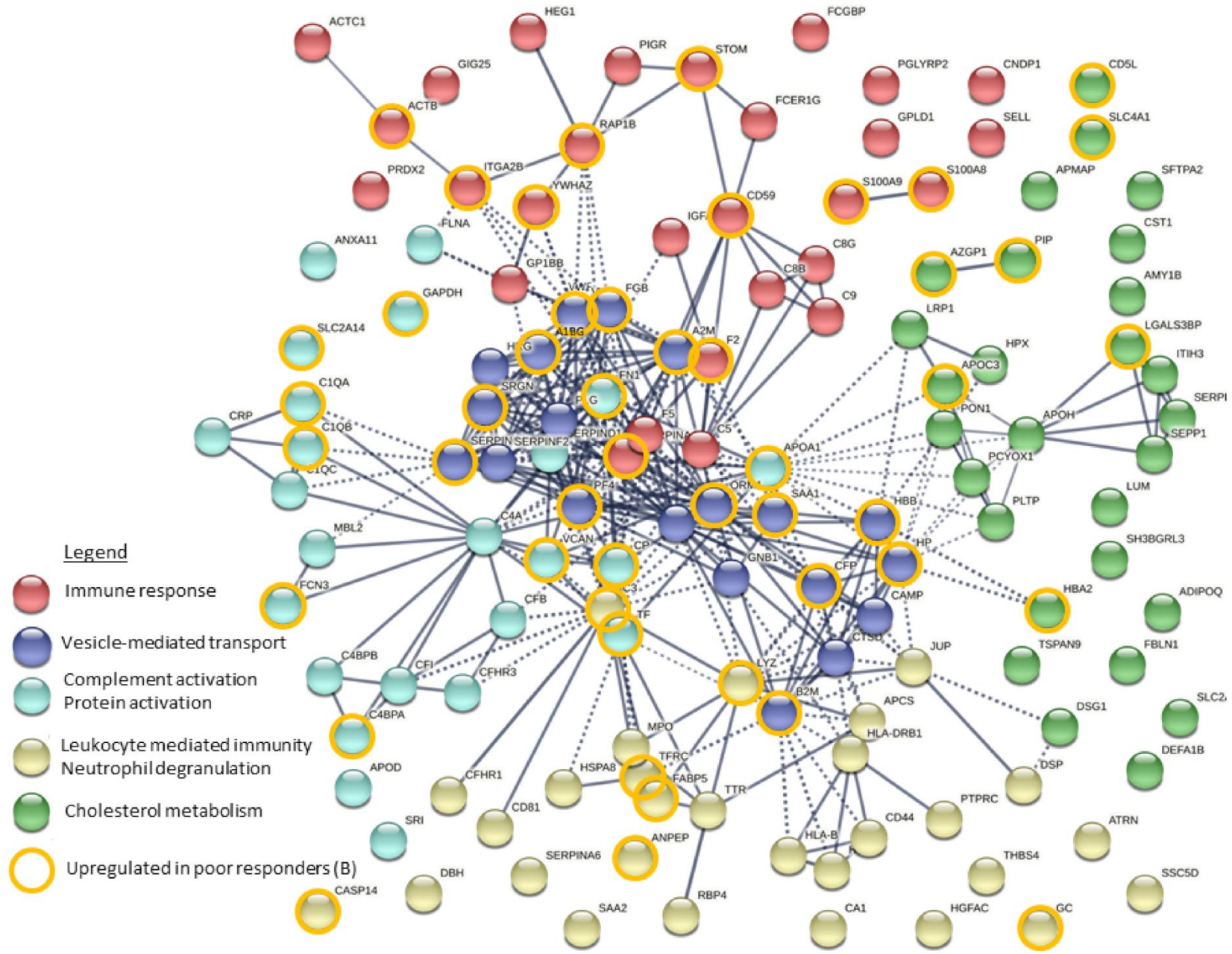


A) PLASMA

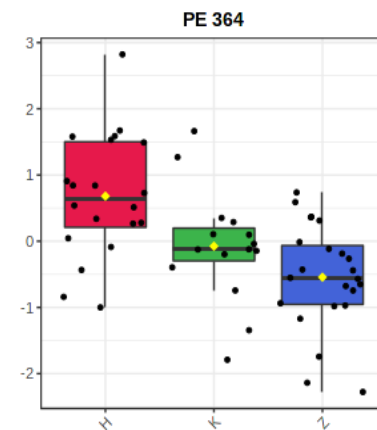
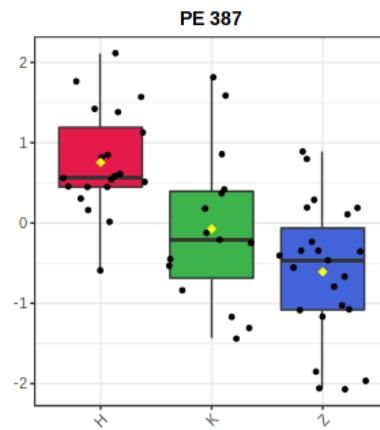
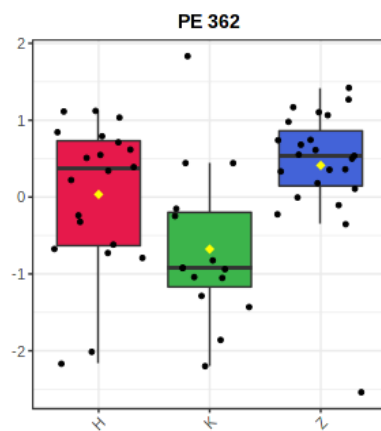
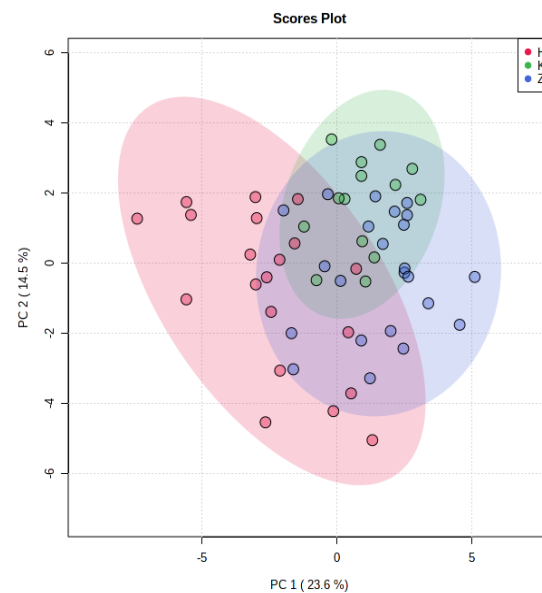
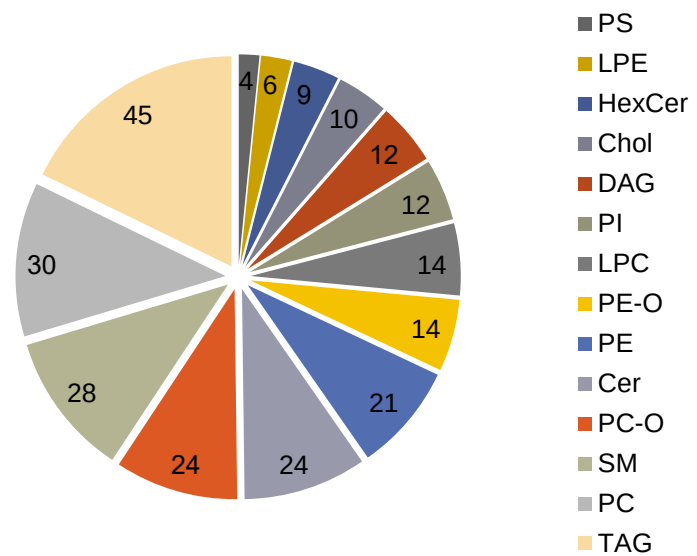


B) EXOSOMES





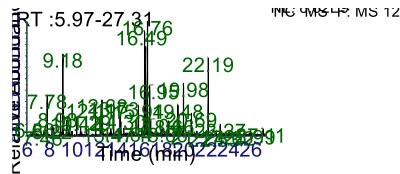
Human plasma lipidomics



GC-MS (TripleQuad)

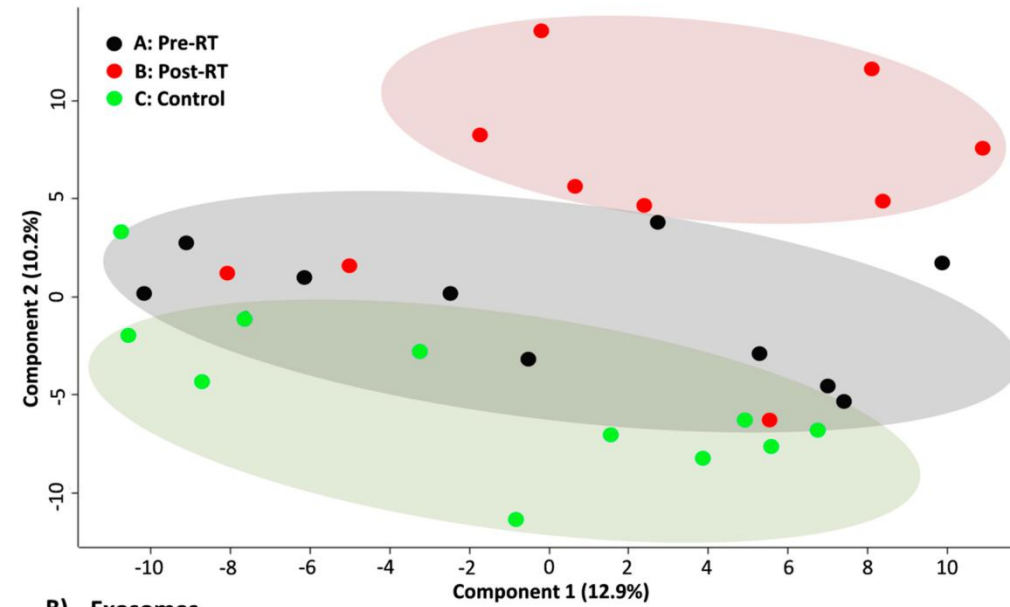


- EI or CI ionization
- additional ion fragmentation in CID mode
- very high sensitivity in MRM mode (up to 500 MRM / second)
- targeted analysis of volatile metabolites (qualitative and quantitative)

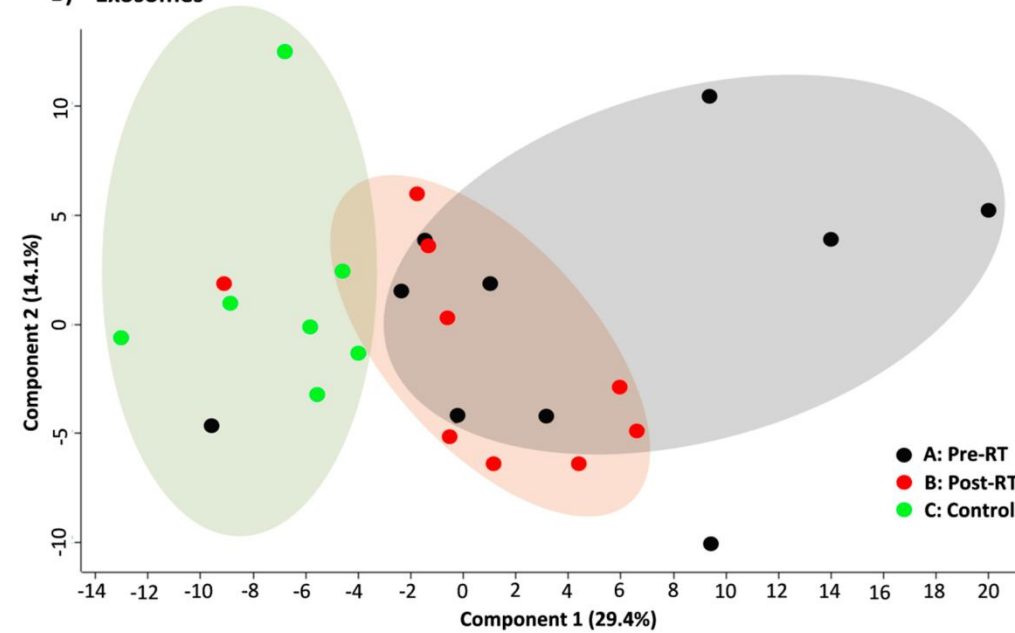


Metabolomic profiling

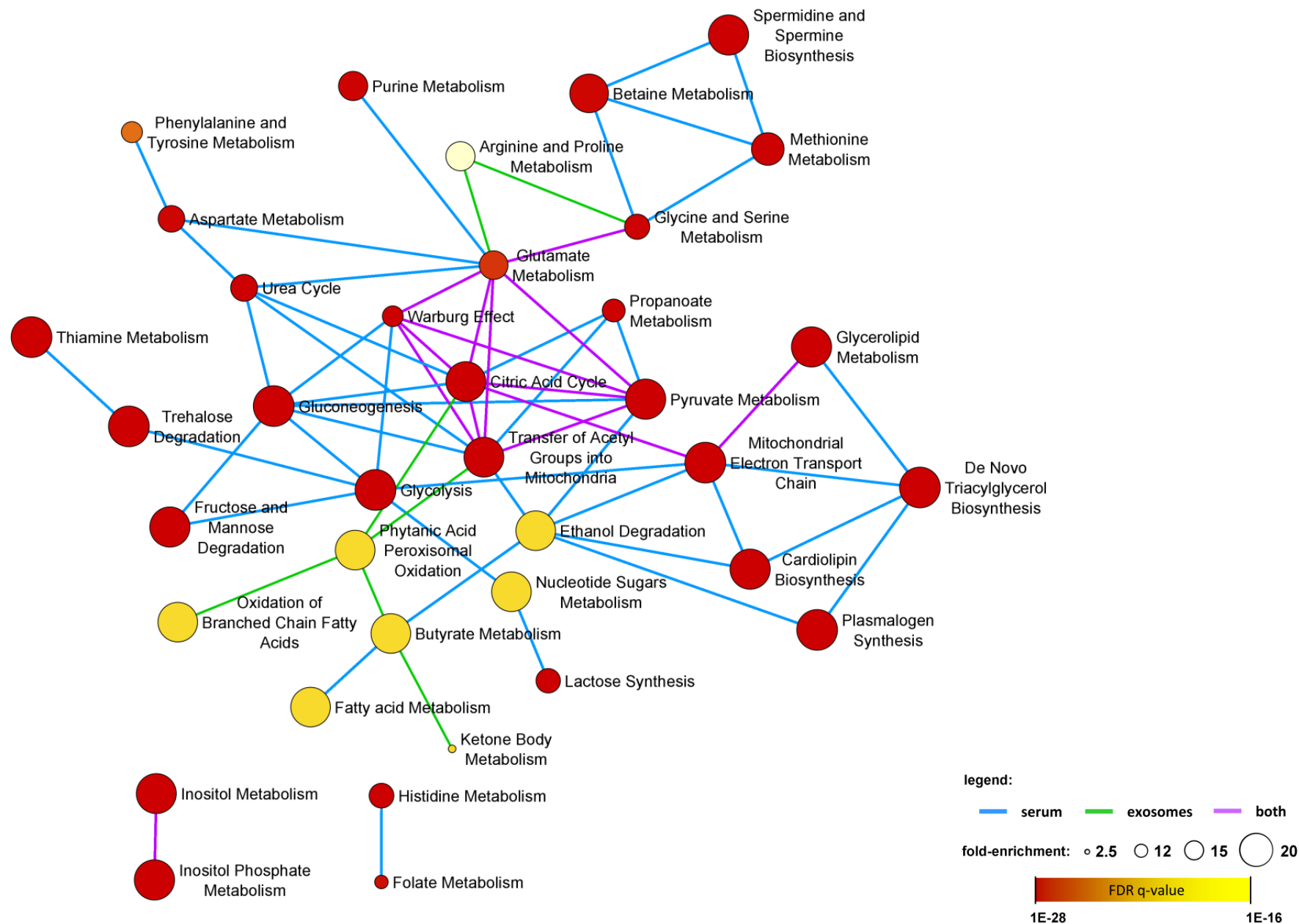
A) Serum



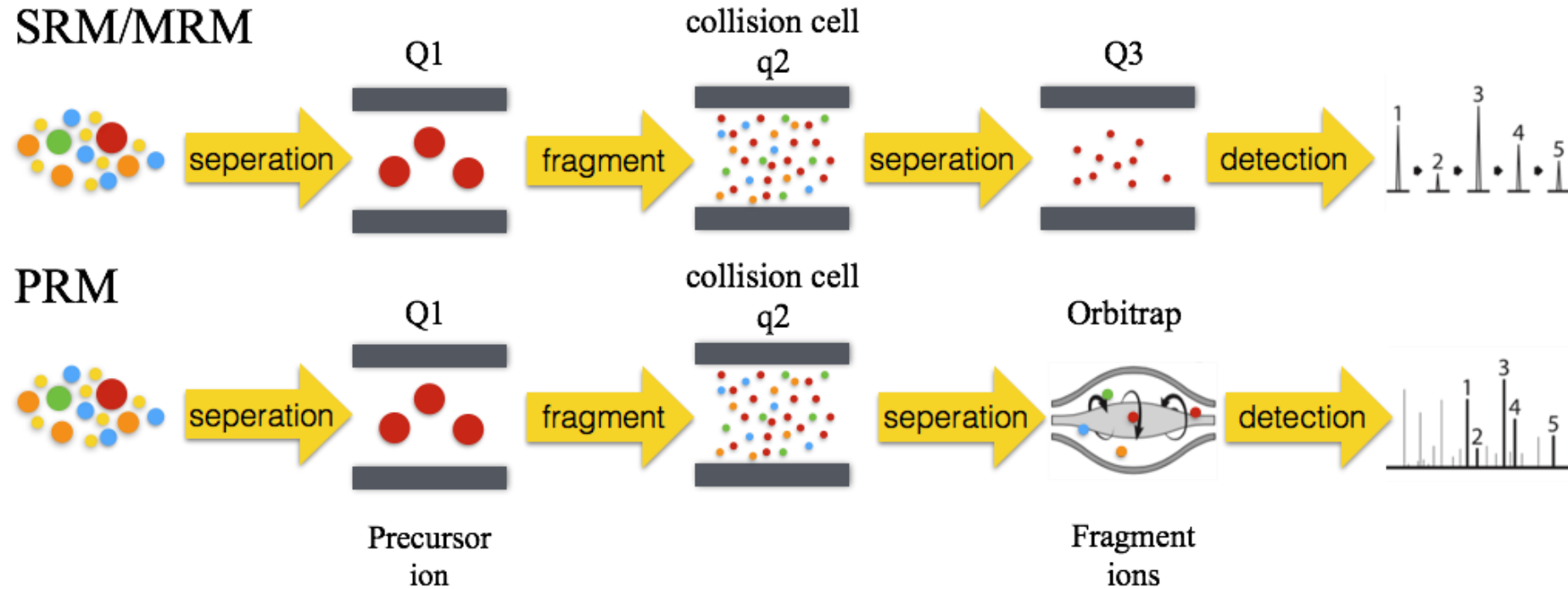
B) Exosomes



Metabolic pathways associated with metabolites differentiating head and neck cancer



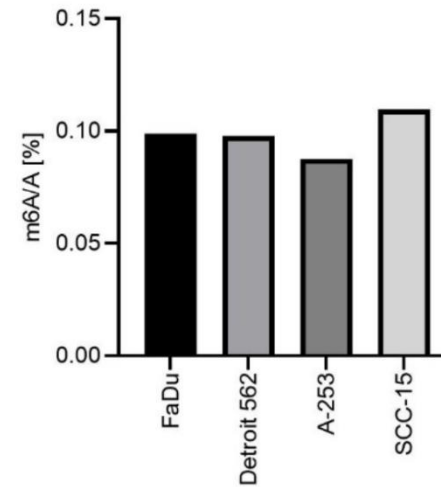
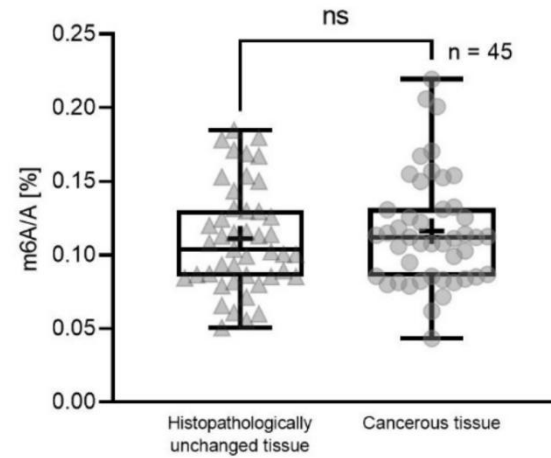
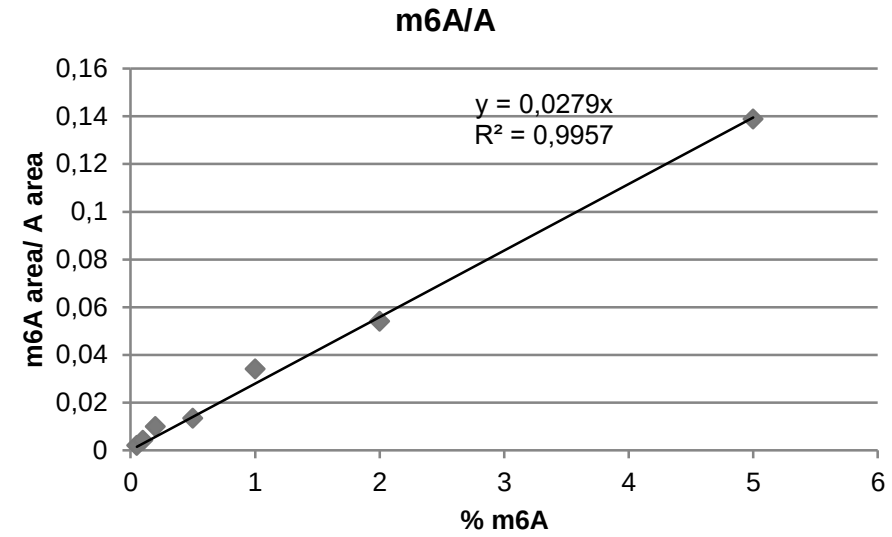
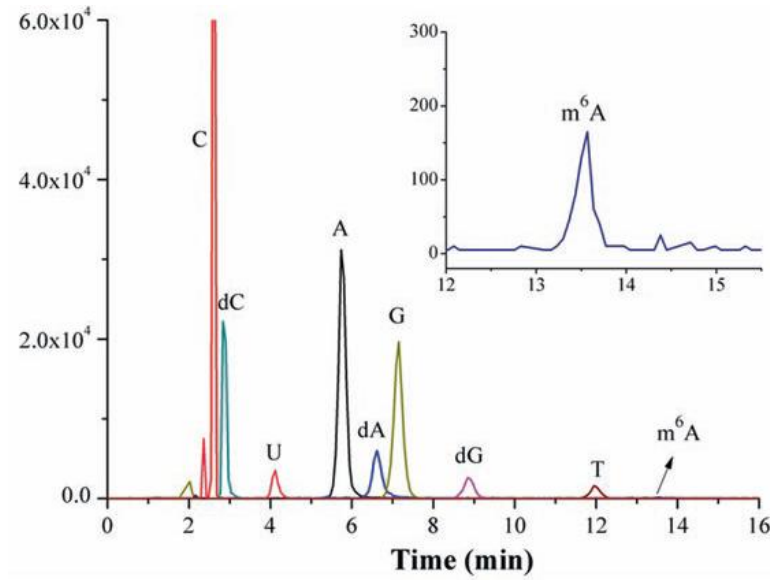
Targeted Analysis



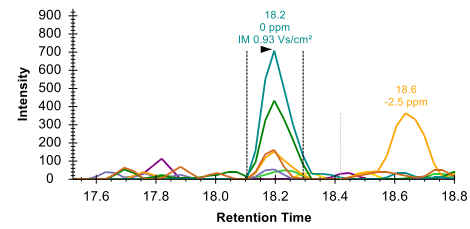
MRM – only using GC-MS

PRM – on LC using Orbitrap

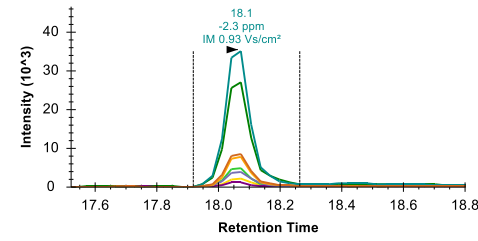
Adenosine methylation analysis (PRM)



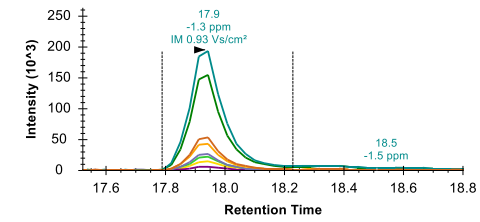
15pg of ADH1



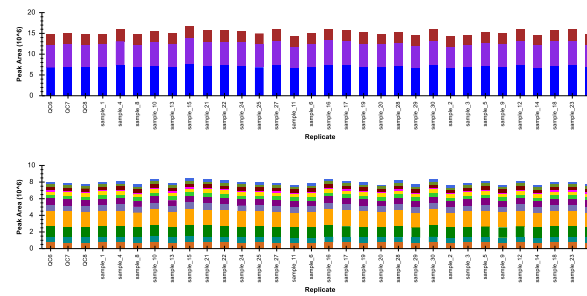
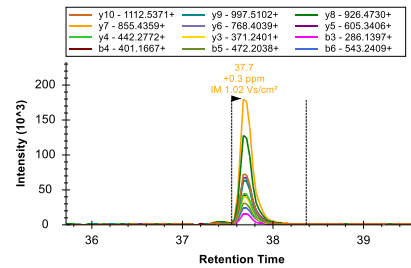
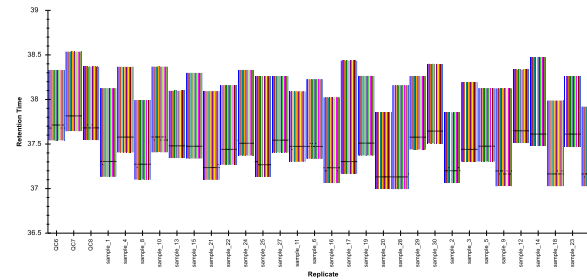
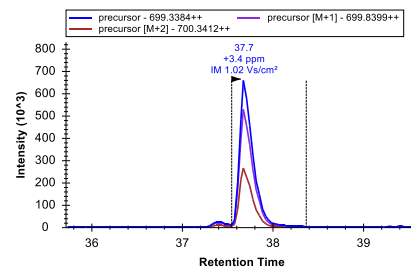
0.8ng of ADH1



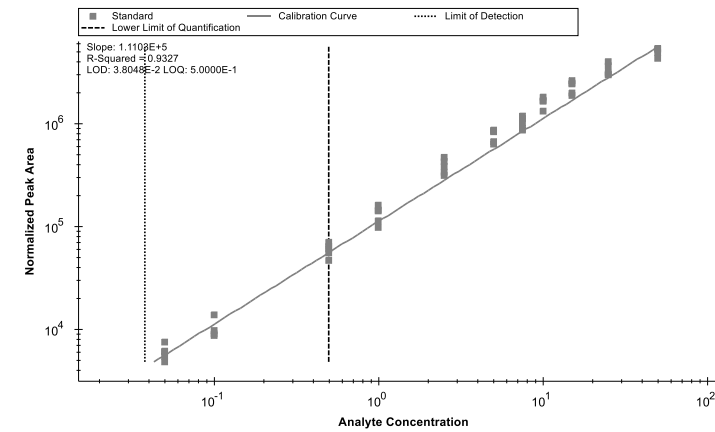
8ng of ADH1



Reproducibility – peak shape, area and retention time



Linearity and high dynamic range



Laboratory offer (summary)

- Accurate determination of molecular (monoisotopic) weight of compounds (HRMS)
- Identification and confirmation of the compound structure on the basis of MS/MS spectra
- Protein identification (from mixtures, gel bands, de novo analysis, etc.)
- Comparative quantitative analysis of proteins in mixtures
- Analysis of post-translational modifications of proteins
- Quantitative analysis of metabolites and other low molecular weight compounds (e.g. amino acids, modified nucleotides, hormones, etc.)



INSTITUTE OF BIOORGANIC CHEMISTRY
Polish Academy of Sciences

Laboratory of Molecular Assays and Imaging

head of laboratory: Dorota Kwiatek-Rożek, PhD
dkwiatek@ibch.poznan.pl

Centre for Chemical Biology ERIC
Institute of Bioorganic Chemistry Polish Academy of Sciences



Laboratory of Molecular Assays and Imaging Screening Partner Site of EU-OPENSREEN

head: dr Dorota Kwiatek-Rożek

1. High Throughput Screening (HTS)

dr Krzysztof Żukowski
dr Aleksandra Bartkowiak
dr Kinga Ciechanowska
mgr Monika Pyc
mgr Natalia Karczewska

2. Superresolution Imaging (MINFLUX)

mgr Adrian Rufli – equipment manager
dr Francesca Canyelles
dr Volodymyr Cherkas with his project team:
(Long-term – to support Ukrainian research teams” program
mgr Oleksandra Hrubiiian , mgr Mykyta Bobylyow, mgr Borys Olifirov, dr Yevhenii Sheremet)

Research Support Unit, IBCH PAS: dr Michał Gładysz

Laboratory of Medicinal Chemistry

head: dr Dorota Jakubczyk

3. Design and synthesis

- Natural product analogs
- Targeted chemical libraries
- Chemoproteomic probes (target IID)

HIGH THROUGHPUT SCREENING

CENTRE FOR CHEMICAL BIOLOGY ERIC
POL-OPENSREEN



eu:openscreen

POL-OPENSREEN - Projekt Polskiej Platformy Infrastruktury Skringingowej dla Chemii Biologicznej będącej częścią europejskiego konsorcjum
EU-OPENSREEN - European Infrastructure of Open Screening Platforms for Chemical Biology European Research Infrastructure Consortium

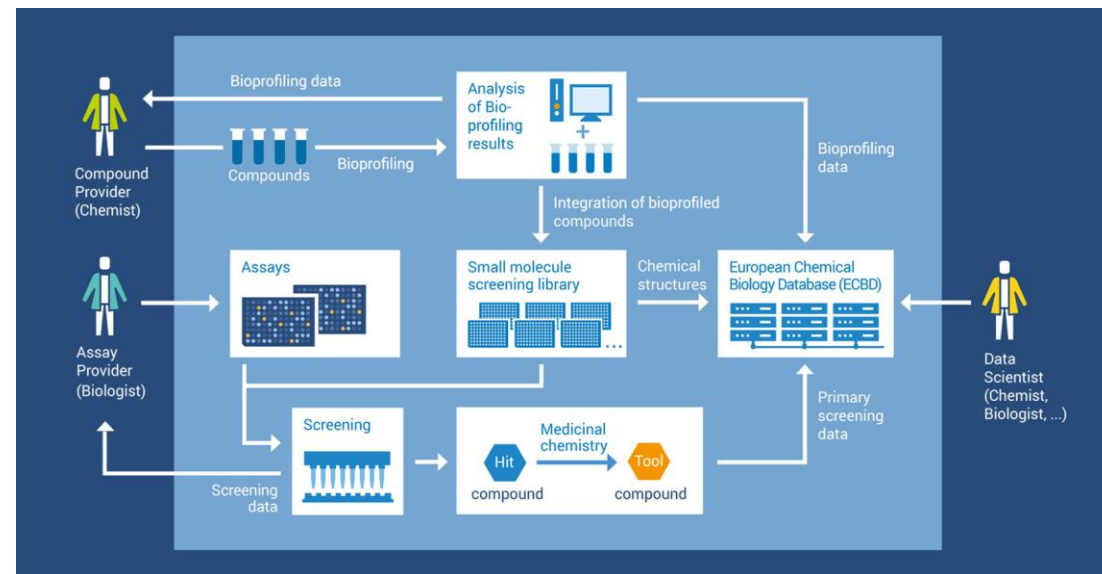
Overview of EU-OPENSREEN's Compound Collections

Sub-library (library)	Count	Description
European Chemical Biology Library	98,560	Large diversity library selected by EU-OPENSREEN sites Download SD file Please note the replenishment fees when screening this library (see details below)
Representative diverse set (ECBL)	2,464	A representative subset of the diversity library Download SD-File
Bioactives	2,464	Custom bioactives library with emphasis on wide target coverage
Nuisance	88	A representative set of nuisance compounds in biological screening
Pilot library	5,016	Combination of the (i) representative diverse set, (ii) bioactives and (iii) nuisance libraries
Fragments (EFSL)	1,056	Fragment library selected by EU-OPENSREEN. Paper: "Design, quality and validation of the EU-OPENSREEN fragment library poised to a high-throughput screening collection sites." Download SD-File
Mini 88 fragments (EFSL)	88	A representative subset of the fragments library
Academic compounds (EACL)	5,280	Compounds submitted to EU-OPENSREEN by academic institutions
Total	107,414	



EU-OPENSREEN is a not-for-profit European Research Infrastructure Consortium (ERIC) for chemical biology and early drug discovery.

We support all stages of a chemical tool development project, including assay adaptation, high-throughput screening and chemical optimisation of the resulting 'hit' compounds.

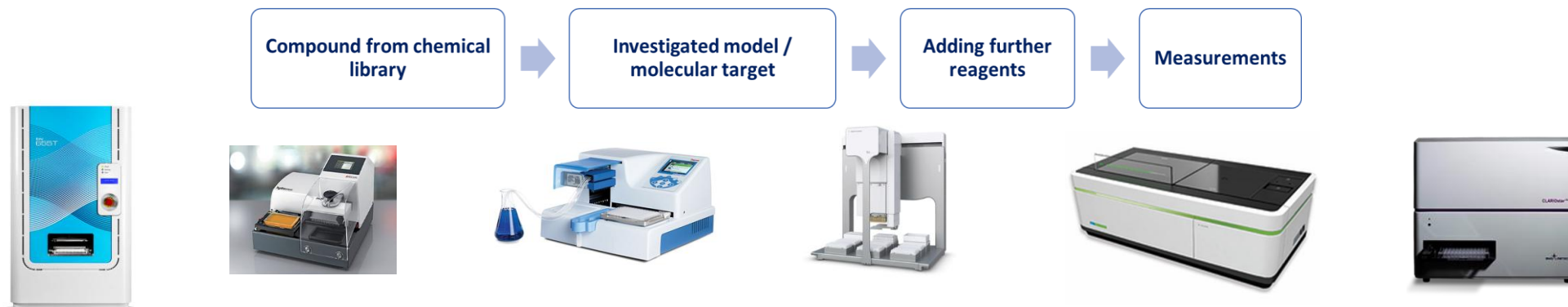


HIGH THROUGHPUT SCREENING

CENTRE FOR CHEMICAL BIOLOGY ERIC



eu:openscreen



Assay types

- Biochemical assays:
 - Absorbance
 - Fluorescence and colorimetric
 - Luminescence
 - Bioluminescence (luciferase based)
- Cell based assays:
 - Target based (ex. Reporter assay)
 - Phenotypic (cell painting)
 - High Content Screening
 - Multiparametric assays (cytotoxicity studies)

Assay development

- Single and multi-parametric assays
- Miniaturisation and optimisation
- Automation and assay transfer
- Orthogonal assay

High Throughput Screening

- Primary screening (1k – 100k)
- Hit validation:
 - 3 concentrations
 - IC/EC50 determination
- Counter / orthogonal screening

Benefits

- Unique and carefully selected compound collections
- Access to screening centres and chemical facilities throughout Europe operating cutting-edge equipment
- European Chemical Biology open-access database (ECBD) containing open research data and protocols
- Transformation of your assay into an HTS-ready format
- Bioprofiling and screening of your submitted compounds
- Screening of your assay against EU-OPENSREEN's unique compound collections
- Follow-up chemistry to develop your initial 'hit' compound into a valuable 'tool' compound
- High-quality standards Europe-wide
- Open collaborative framework/harmonised legal framework



dr Krzysztof Żukowski

Applications of HTS

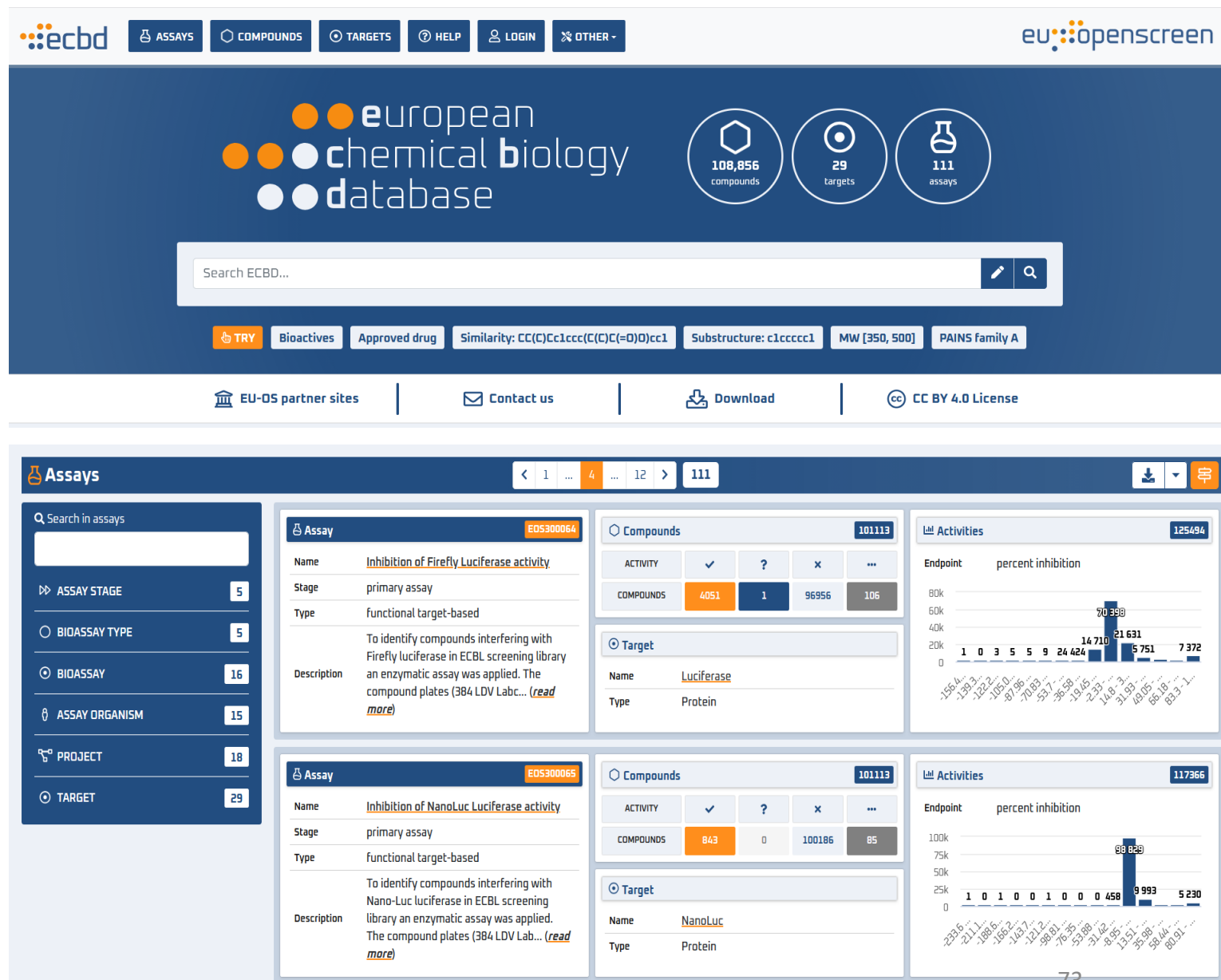
Bioprofiling – 6 batches tested (results uploaded to ECBD)

1. Bioluminescence reporter interference assay

- Luciferase activation/inhibition tests (Firefly, Renilla, NanoLuc) in 384-well format
- Detects interference with common reporter enzymes
- Helps identify screening artefacts and false positives

2. ROS (Reactive Oxygen Species) generation assays

- Resazurin fluorescence assay (TCEP and DTT reductants) – detection of redox-active compounds
- Phenol red oxidation assay with HRP and H₂O₂ – detection of H₂O₂-producing compounds
- Both assays performed in 384-well format
- Redox-active compounds often cause false positives by oxidizing protein disulfide bonds or reacting with cofactors



Applications of HTS



mgr Natalia Karczewska



mgr Monika Pyc

Cell Painting Assay

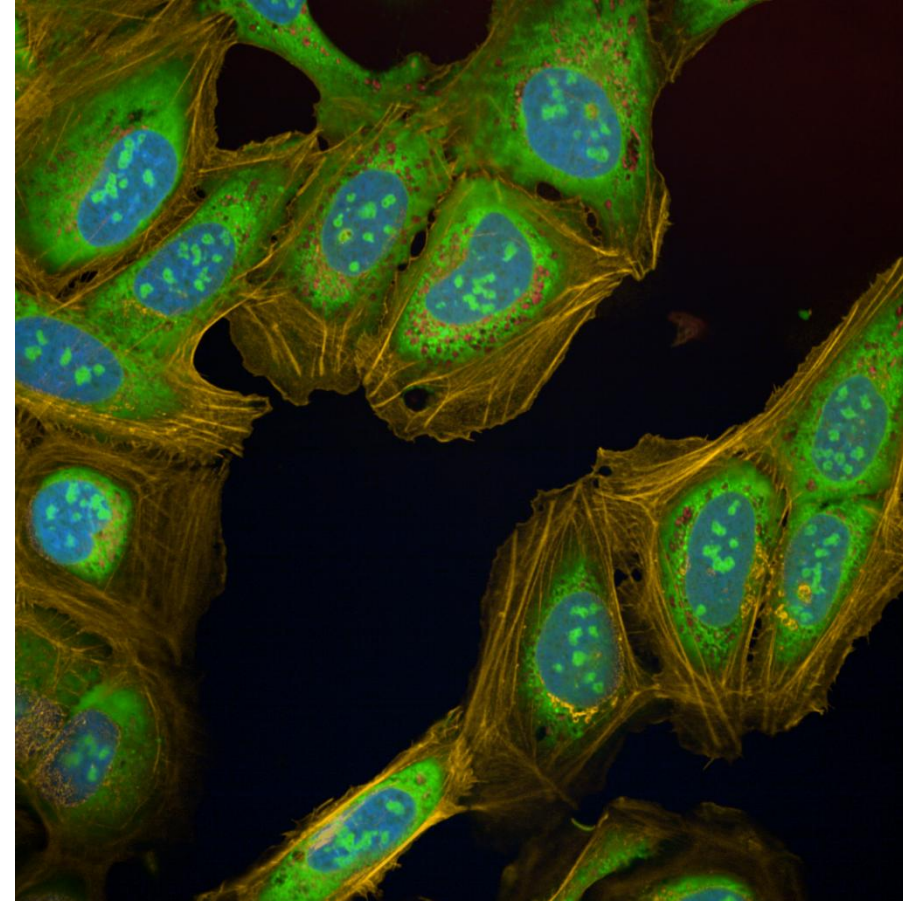
High content, image-based, multiparametric assay, used for cytological profiling. Phenotypic screening method based on staining different subcellular structures with fluorescent dyes.

Application of the method:

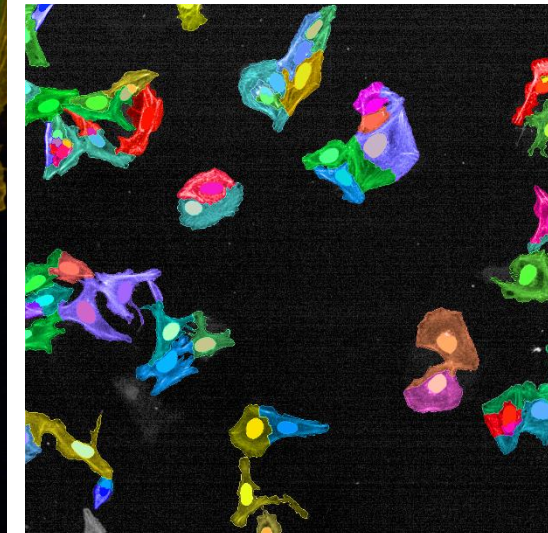
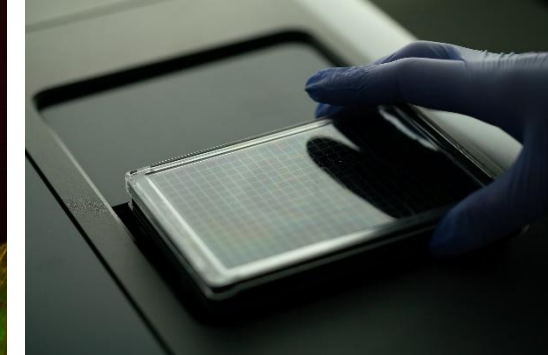
- Predicting the mechanism of action (MOA) of compounds
- Grouping compounds based on MOA
- Identifying cell line-specific effects
- Identifying compounds with new MOA
- Evaluation of cytotoxicity of compounds

Examples of studies:

- Dynamic organization of proteins
- Cell viability
- Cell Proliferation and toxicity
- DNA damage
- Validation of fluorescence kits or probes:
 - Validation of new multi-organelle cell painting kit for phenotype differentiation
 - Validation and assessment of new mitochondrial probe candidate by High Content Microscopy



U2-OS cell line stained using Cell Painting Assay. Imaging performed using Opera Phenix microscope: confocal mode, 63x water objective, 1 field of view. **Image provided by: MSc Monika Pyc, MSc Natalia Karczewska**



Identification of cell organelles stained using Cell Painting Assay

Service / Assay

Example Application

Miniaturized FITC-casein protease assay

Detection of inhibitors of proteases

Colorimetric phosphate detection assay (malachite green) for reactions consuming ATP

Detection of inhibitors of ATP-dependent enzymes

Miniaturized NADH-based colorimetric assay for reductase activity

Screening for oxidoreductase enzyme inhibitors

Fluorescence Indicator Displacement Assay for identifying compounds binding RNA using the TOPRO-1 fluorescent indicator

Screening for small molecules binding structured RNA targets

Sequential fluorescence toxicity [cell based](#) on resazurin and Hoechst dyes

Compound cytotoxicity and effects on cell number, metabolic activity, and nuclear morphology in high-content screening assays.

FISH-based [cellular](#) screening assays

Detection of compounds affecting gene expression or RNA localization

[Cell imaging](#) assays using adapted commercial kits for organelle visualization

Investigation of mitochondrial dynamics, lysosomal function, ER stress, or other organelle-specific processes using fluorescent probes in various cell lines.

Autophagy assay adapted to the U2-OS [cell line](#)

Screening of chemical compounds or libraries for autophagy modulators (inhibitors or activators) relevant to cancer or neurodegenerative disease research.

Viability screening for suspension [cell lines](#) (e.g., K-562) using CellTiter-Blue assay

Identification of cytotoxic or growth-inhibiting compounds in leukemia cell models during anticancer drug discovery.

Nano-Glo Luciferase assay system in [cell-based screening](#)

Detection of pathway activation or transcriptional responses using luciferase reporter assays in high-throughput compound screening.

Collaboration of IBCH PAS with Revvity

revvity

APPLICATION NOTE

Phenotype discrimination using the PhenoVue cell painting and multi-organelle staining kits.

Key points

- Labeling different combinations of cellular components can be advantageous depending on experimental aims
- Phenotypes were successfully differentiated by both kits
- Both kits are compatible with the cell painting building block in Harmony™ software for feature extraction

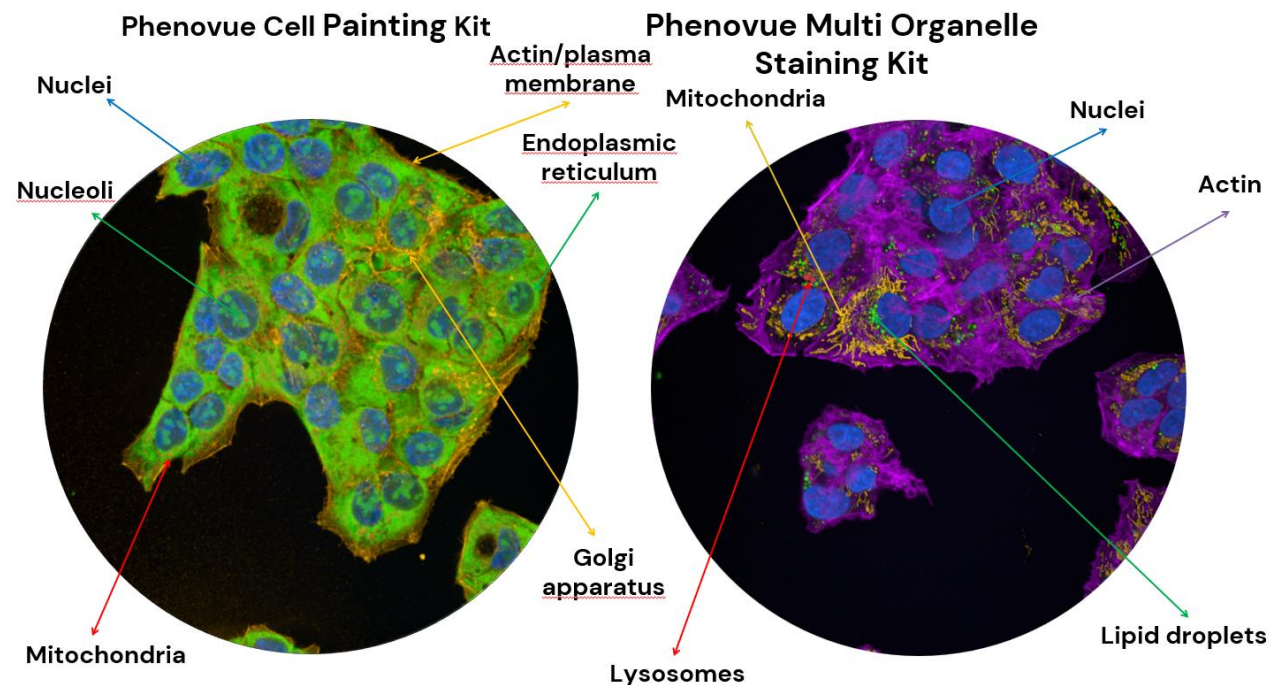


Introduction

Cell painting has gained significant interest in recent years as it allows researchers to capture a comprehensive picture of cellular responses to various perturbations. The cell painting assay uses six stains to label DNA, cytoplasmic RNA, nucleoli, actin, Golgi apparatus, plasma membrane, endoplasmic reticulum and mitochondria. However, other combinations of "paints" or dyes are also possible, enabling the visualization of slightly different cellular components and processes depending on research needs. One such example is the PhenoVue™ multi-organelle staining kit. This kit allows staining of DNA, lipid droplets, actin, mitochondria and lysosomes. With its lysosomal and lipid droplet labels this kit is tailored towards studying cellular metabolism or disorders associated with dysfunctional lysosomes or lipid homeostasis (see info box).

In collaboration with the Institute of Bioorganic Chemistry (IBCH) in Poland, we analyzed the phenotypes induced by a set of 15 reference compounds using both the PhenoVue cell painting kit and the PhenoVue multi-organelle staining kit to compare phenotypic discrimination results of the two assays. Among the compounds are well-known agents that affect various organelles and serve as reference standards for cell painting, compounds that impact lipid homeostasis, such as oleic acid, and six drug-induced liver injury (DILI) compounds with varying DILI scores (DILIrank database).

Our results indicate that both kits successfully differentiated the phenotypes induced by the compounds; however, the multi-organelle kit showed better separation indicated by greater Euclidian distances for certain compounds, suggesting a slightly more sensitive detection of subtle phenotypic changes at lower concentrations.



PhenoVue Multi-organelle Staining Kit 1x384 wells

SDS COAs Knowledge base



About the product

PhenoVue™ Multi-organelle Staining Kit comprises five validated, optimized and ready-to-use fluorescent probes to visualize mitochondria, lysosomes, lipid droplets, actin cytoskeleton, and nuclei in a 5-plex experiment.

The kit is validated for use on high-content screening systems such as the Opera Phenix® Plus high content screening system, and is ideal for the study of metabolic disorders, infectious diseases, and liver toxicity.

View our extensive validation data in the Product Information Sheet within the Resources tab below.

[View product information](#)

Product variant

Quantity: 1 kit

Part #: PMOS11

For research use only. Not for use in diagnostic procedures.

[Request more information](#)

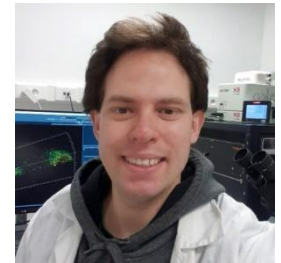
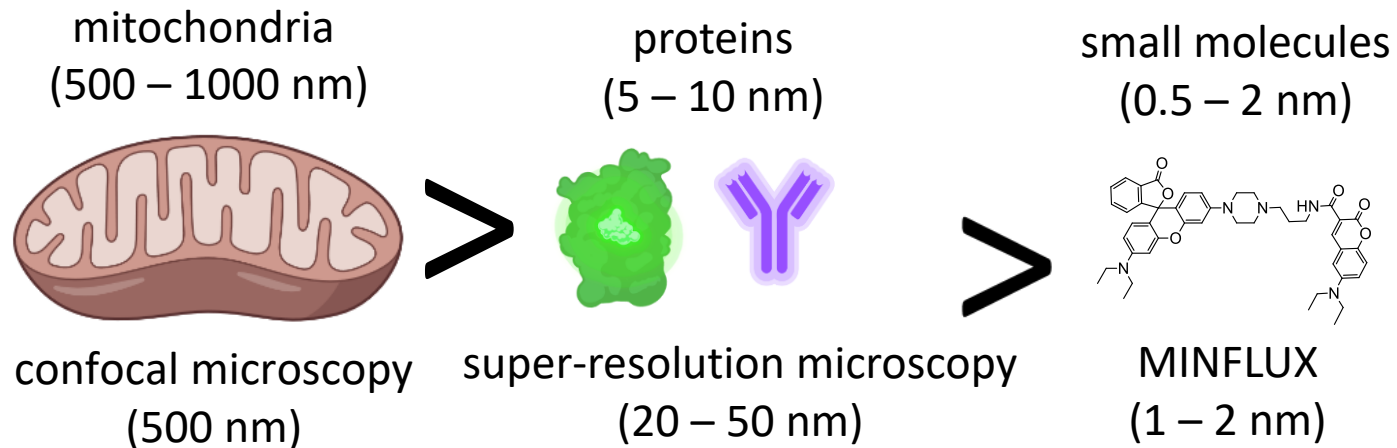
Super-resolution system – MINFLUX Imaging System

ONE SYSTEM – MULTIPLE TECHNIQUES

MINFLUX Imaging System				
Operated techniques	MINFLUX (Minimal fluorescence photon fluxes)	STED (Stimulated emission depletion)	LSCM (Laser scanning confocal microscopy)	FLIM (Fluorescence life time imaging)
Key capability	≥ 2 nm resolution	≥ 30 nm resolution	Sample overview and spectra scans (≥200 nm)	Spatially resolved fluorescence life time data
Our hardware	MINFLUX lasers: 488 nm, 561 nm and 640 nm	Depletion lasers: 595 nm and 775 nm	Excitation lasers: 405 nm, 488 nm, 561 nm and 640 nm	
Measurement output	Fluorophore localization point cloud (x,y,z coordinates)	Raster image	Raster image	Raster image/ fluorescence life time data



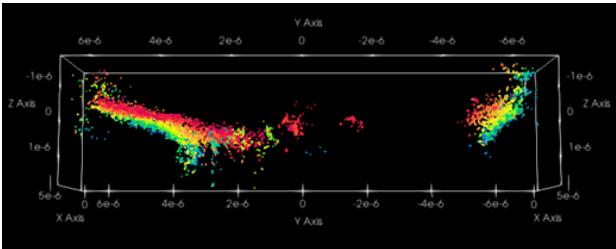
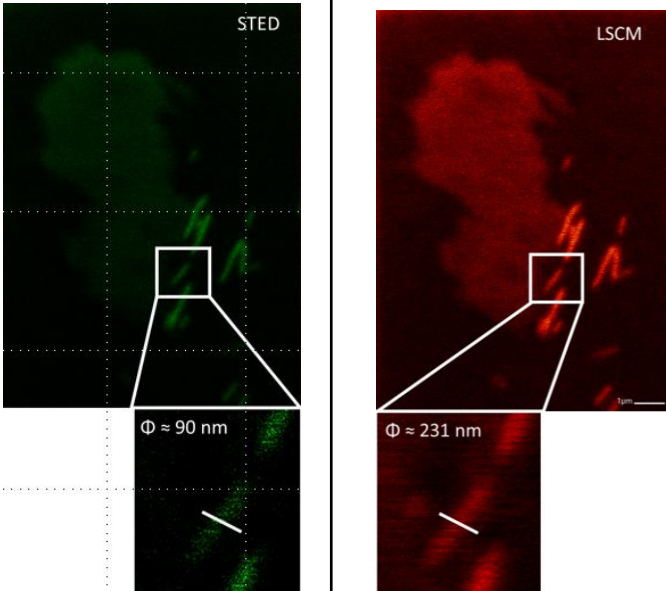
dr Francesca Canyelles



mgr Adrian Rufli

MINFLUX Imaging System – Exemplary Results

ONE SYSTEM – MULTIPLE TECHNIQUES

MINFLUX Imaging System				
Operated techniques	MINFLUX (Minimal fluorescence photon fluxes)	STED (Stimulated emission depletion)	LSCM (Laser scanning confocal microscopy)	FLIM (Fluorescence life time imaging)
Key capability	$\geq 2 \text{ nm resolution}$	$\geq 30 \text{ nm resolution}$	Sample overview and spectra scans	Spatially resolved fluorescence life time data
Example	 Imaging performed as part of the OPUS project 2021/41/B/NZ2/03781 dr hab. Anna Kurzyńska Kokorniak (Department of Ribonucleoprotein Biochemistry), task: visualization of hDice-RNA/DNA G-quadruplex complexes in human cells using nanoscopy in the Molecular Testing and Imaging Laboratory. Dicer protein (HEK293T line) labeled with FLUX640	 Direct comparison of STED image (left) and confocal image (right) of the rhodamine 110 labelled graphene oxide material. The STED image shows a 2.5-fold increase in resolution within the measured region.		
		Raster image	Raster image	
Measurement output	Fluorophore localization point cloud (x,y,z coordinates)			Raster image/ fluorescence life time data

MINFLUX Imaging System – Exemplary Results

Sample requirements – what do we need from our Users?

System requirements: fixed-cell imaging
Special samples? Contact us!

STED and MINFLUX utilize **special** fluorophores
Many super-resolution labelling strategies are compatible with other established imaging techniques
Maybe consider using a super-resolution compatible strategy in Your experiments?

Labelling strategies	STED	MINFLUX	LSCM
Immunostaining	✓	✗	✓
Protein-tag (SNAP-tag, HALO-tag)	✓	✓	✓
Bioorthogonal staining	✓	✓	✓

	<i>abberior FLUX</i>	<i>abberior STAR</i>	<i>abberior LIVE</i>	Fluorescent proteins	Other dyes
STED	✗	✓	✓	○	Contact us!
MINFLUX	✓	✗	✗	✗	
LSCM	○	✓	✓	✓	

○ - Contact us, and we might make it work

MINFLUX Imaging System – Exemplary Results

Sample requirements – what do we need from our Users?



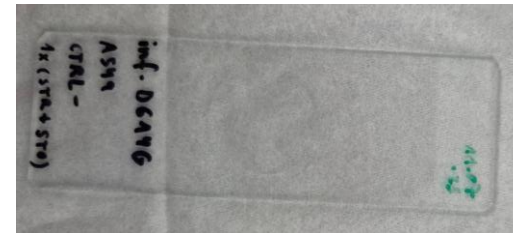
Grow cells on no.1 round
Φ18 mm coverslips
(thickness 0.13-0.16 mm)
(contact us concerning
coating use)



Cells are usually grown and stained
on a 12 or 6 well-plate

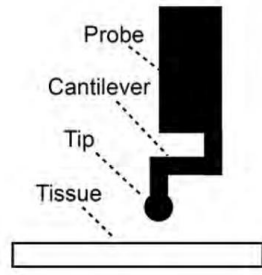


Assembled **MINFLUX**
microscope slide ready for
measurements



Assembled **STED**
microscope slide ready for
measurements

	Stabilization?	Mounting medium
STED	✗	Abberior MOUNT ANTIFADE
MINFLUX	Addition of gold nano-particles ✓	GLOX - buffer
LSCM	✗	Standard methods



NANOINDENTATION: Cell rheology

Images: <https://www.optics11life.com/products/pavone-nanoindenter/>



dr. Francesca Canyelles

	Single indentations	Matrix scan (ROI dx, dy (μm))																				
Sample type	Biological 2D culture, <i>C. elegans</i>	Biological 2D culture																				
Sample format	24- to 96-well plates (also coverslips)																					
Measurement output	Force-displacement curves																					
Data analysis output	A) Cell stiffness (Young's Modulus, Pa) <table><thead><tr><th></th><th>neg ctrl</th><th>pos ctrl</th><th>NM</th></tr></thead><tbody><tr><td>Mean [Pa]</td><td>2082.71</td><td>11530.44</td><td>2681.20</td></tr><tr><td>Median [Pa]</td><td>1722.70</td><td>5523.64</td><td>2085.33</td></tr><tr><td>st dev [Pa]</td><td>1385.74</td><td>16865.68</td><td>2001.74</td></tr><tr><td>N</td><td>165</td><td>119</td><td>159</td></tr></tbody></table>		neg ctrl	pos ctrl	NM	Mean [Pa]	2082.71	11530.44	2681.20	Median [Pa]	1722.70	5523.64	2085.33	st dev [Pa]	1385.74	16865.68	2001.74	N	165	119	159	A) Cell stiffness map (Young's Modulus, Pa) B) Topography map (μm) neg ctrl NM
	neg ctrl	pos ctrl	NM																			
Mean [Pa]	2082.71	11530.44	2681.20																			
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N	165	119	159																			

List of projects or services

Project title	Project PI	Project duration	Financing institution	Related to EU-OS [Y/N]
POL-OPENSSCREEN 2.0 - Maintenance, Development and Sharing of the Polish Screening Infrastructure Platform for Biological Chemistry, in view of the Participation in the EU-OPENSSCREEN ERIC Research Infrastructure Consortium - Co-financed by the Minister of Science program "Support for the participation of Polish research teams in international research infrastructure projects.	Dorota Kwiatek-Rożek, PhD Project leader - IBM PAS - prof. dr hab. Zbigniew Leśnikowski)	2024-2028	MNiSW	Y
POL-OPENSSCREEN - FENG.02.04-IP.04-0010/24-00 - Project of the Polish Platform of Screening Infrastructure for Biological Chemistry, which is part of the EU-OPENSSCREEN (European Infrastructure of Open Screening Platforms for Chemical Biology European Research Infrastructure Consortium). Financed by the Ministry of Science and Higher Education	Dorota Jakubczyk, PhD Project leader - IBM PAS – Prof. Jarosław Dziadek, PhD, DSc	2025-2027	MNiSW	Y

Project No. / Financing Institution	Related to EU-OS [Y/N]	Years of realization	Primary assay modality	Screening scale
OPUS - 2020/39/B/NZ3/01811/NCN	Y	2021-2026	cellular	5k (EU-OS Pilot Library)
NCBIRPOIR.01.01.01-00-2450/20 NCBIR - Fast Track 5/NCBIR	Y	2020-2024	Biochemical + cellular	5k (EU-OS Pilot Library) +2.5k (EU-OS Bioactives Library)
OPUS 2021/41/B/NZ2/03781/NCN	Y	2022-2026	cellular	N/A
OPUS 2021/43/B/NZ7/01611/NCN	Y	2023-2025	biochemical	EU-OS ECBL (100k)
2020/39/B/NZ1/03054/NCN	N	2021-2025	biochemical	8 RNA x 10.2k cmpds
OPUS 2021/41/B/NZ1/03819/NCN	N	2022-2026	biochemical	9 RNA x 15.5k cmpds 4 RNA x 5.3k cmpds
Miniatura 7 2023/07/X/ST5/00977/NCN	N	2023-2025	cellular	N/A
101132028/ EU Commission	Y	2024-2026	cellular/biochemical	3 assays x EU-OS EACL compounds library
101046133 / EU Commission	Y	2022-2025	cellular/biochemical	5k (EU-OS Pilot Library)/EU-OS ECBL (100k)
101042642 / EU Commission	Y	2022-2027	cellular	5k (EU-OS Pilot Library) x 2
10109271 / EU Commission	N	2023-2023	Biochemical/Cellular	N/A
GA No 823893 / EU Commission	Y	2019-2023	biochemical	100k EU-OS EABL compounds library
Service for EU-OPENSSCREEN	Y	2022-2025	biochemical	3 assays x EU-OS EACL compounds library
Service for EU-OPENSSCREEN	Y	2022-2025	biochemical	3 assays x EU-OS EACL compounds library
2021/05/X/NZ7/01440/NCN	N	2021-2022	biochemical	N/A
SONATA 2017/26/D/NZ1/01234/NCN	N	2018-2023	biochemical	N/A
2018/29/B/ST4/01498/NCN	N	2019-2024	biochemical	N/A
PASIFIC/EU Horizon	N	2022	cellular	N/A
Cambridge University/EU-OPENSSCREEN	Y	2022	biochemical	PILOT (5k)
Ludwig-Maximilians-Universitaet Muenchen / EU-OPENSSCREEN	Y	2022	biochemical	PILOT (5k)
2018/30/E/NZ1/00729/NCN	Y	2022	biochemical	PILOT (5k)
Revitty	N	2023-2025	cellular	N/A

List of publications

A. Schreiner, A. Foitzik, K. Boettcher, B. Sonnenberg, F. Ch. Savournin, T. Roux, **N. Karczewska, M. Pyc, D. Kwiatek, J. Kolanowski** Application note: Phenotype discrimination using the PhenoVue cell painting and multi-organelle staining kits <https://resources.revvity.com/pdfs/app-multi-organelle-cell-painting-phenotype-discrimination.pdf>

F. Canyelles I Font, K. Żukowski, M. A. Khan, D. Kwiatek, J. L. Kolanowski, Interference of metal ions on the bioluminescent signal of firefly, Renilla, and NanoLuc luciferases in high-throughput screening assays, *Frontiers in Chemistry* (2024) Nov 26:12:1436389. doi: 10.3389/fchem.2024.1436389

M. Insińska-Rak, A. Golczak, M. Gierszewski, Z. Anwar, **V. Cherkas, D. Kwiatek**, E. Sikorska, I. Khmelinskii, G. Burdziński, R. Cibulka, L. Mrówczyńska, **J. L. Kolanowski**, M. Sikorski, 5-Deazaalloxazine as a photosensitizer of singlet oxygen and potential redox-sensitive agent, *Photochemical and Photobiological Sciences* 22 (2023) 1655–1671.

A. Golczak, D. Prukąła, E. Sikorska, M. Gierszewski, **V. Cherkas, D. Kwiatek**, A. Kubiak, N. Varma, T. Pędziński, S. Murphree, R. Cibulka, L. Mrówczyńska, **J. L. Kolanowski**, M. Sikorski, Tetramethylalloxazines as efficient singlet oxygen photosensitizers and potential redox-sensitive agents, *Scientific Reports* 13 (2023) 13426.

A. Wychowaniec, F. Canyelles i Font, M. A. Khan, M. Gładysz, D. Kwiatek, J.L. Kolanowski, Multi-analyte, small-molecule luminescent probes for simultaneous detection of several molecular targets in cellular models, *Postępy Biochemii* (2024) 10.18388/pb.2021_538

N. Karczewska, M. Pyc, K. Żukowski, J. Kosman, D. Kwiatek, J.L. Kolanowski, The role and use of high-throughput screening in the search for therapeutic compounds, *Postępy Biochemii* (2024) 10.18388/pb.2021_528

JL. Kolanowski, F. Liu, E.J. New, Fluorescent probes for the simultaneous detection of multiple analytes in biology. *Chem Soc Rev.* 2018 Jan 2;47(1):195-208. doi: 10.1039/c7cs00528h. PMID: 29119192.

How to work with us ?

1. Please contact us at least 1 month before your grant application deadline !
2. Meet us live or on-line !
3. What we can do for you?:
 - a. time and cost estimation
 - b. help in grant proposal preparation
 - c. estimation of the microscope application for your purpose

dkwiatek@ibch.poznan.pl

Room 207 (level II) CIES





INSTITUTE OF BIOORGANIC CHEMISTRY
Polish Academy of Sciences

Laboratory of Medicinal Chemistry

Centre for Chemical Biology ERIC

Dr. Dorota Jakubczyk

Centre for Chemical Biology ERIC

Centre for Chemical Biology ERIC

Laboratory of Molecular Assays and imaging

Head: dr Dorota Kwiatek

1. High Throughput Screening (HTS)

2. Super resolution imaging (MINFLUX)

Laboratory of Medicinal Chemistry

Head: dr Dorota Jakubczyk

3. Design, synthesis, biosynthesis and characterization

- Bioactive molecules
- Targeted chemical libraries
- Natural products

Research Support Unit, IBCH PAS: dr Michał Gładysz

Laboratory of Medicinal Chemistry

Head of Laboratory

Dr. Dorota Jakubczyk



Dr. Dorota Jakubczyk

Head of Laboratory

djakubczyk@ibch.poznan.pl
ext. 1165

mail of laboratory: medchemlab@ibch.poznan.pl

Researchers:

Dr. hab. Tomasz Ostrowski

Dr. Przemysław Piechota

Dr. Leszek Błaszczyk

Dr. Monika Józwiak



Dr. Leszek Błaszczyk
adiunkt



Dr. hab. Tomasz Ostrowski
adiunkt



Dr. Przemysław Piechota
adiunkt



Dr. Monika Józwiak
adiunkt

Research and technical employees:

Dr. Grzegorz Framski

PhD student and Technical employee:

M.Sc. Eng. Piotr Michałowski



Dr. Grzegorz Framski
główny specjalista ds.
środowiskowej aparatury
badawczej



Piotr Michałowski
PhD student

Research Support Unit, IBCH PAS: dr Michał Gładysz

European Research Infrastructure ERIC

- European Road Map of Research Infrastructure ESFRI
- Dedicated funding in Horizon Europe
- 36 certified partner sites in 8 member countries
- Partner sites expertise:
 - HTS Screening & Fragment Screening
 - Med Chem - **application**
 - Chemoproteomics
- European Chemical Biology Database

POL  **OPENSSCREEN**

POL-OPENSSCREEN - Projekt Polskiej Platformy Infrastruktury Skriningowej dla Chemii Biologicznej
będącej częścią europejskiego konsorcjum



Equipment

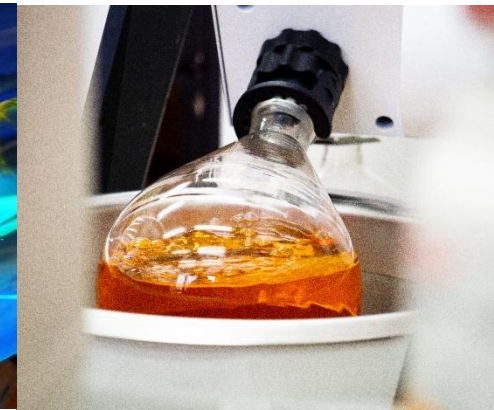
□ Biosynthesis in microbial cultures

- Laminar flow hood
- Incubator with shaking
- Lab freeze dryer
- Freezer -80°C



□ Synthetic chemistry facilities

- Fume hoods
- Rotary evaporators
- Vacuum pumps
- Magnetic stirrers



Equipment

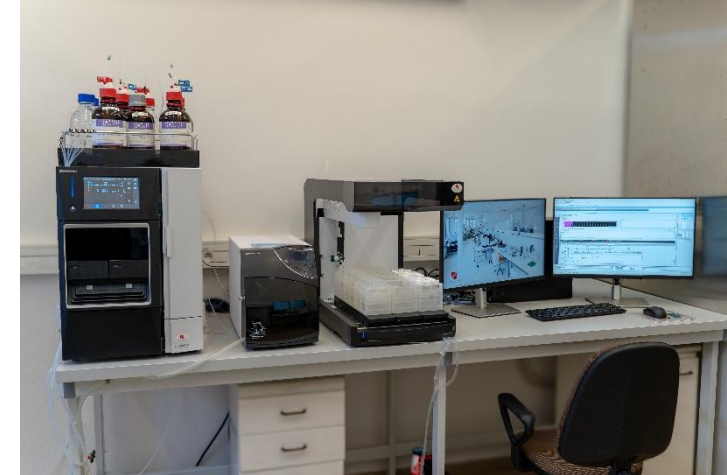
❑ Isolation and purification

- Flash Biotage® Selekt chromatograph
- Semi-preparative High-Performance Liquid Chromatograph (HPLC) with fraction collector
- Evaporative Light Scattering Detector (ELSD)



❑ Analysis

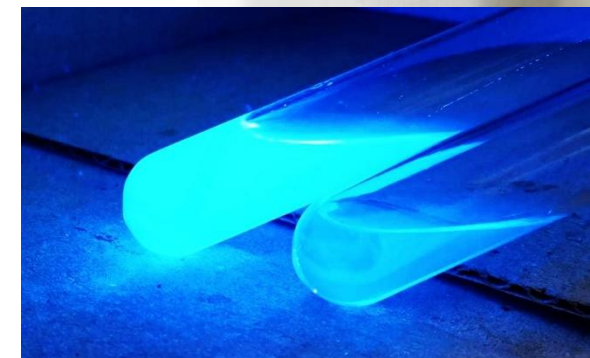
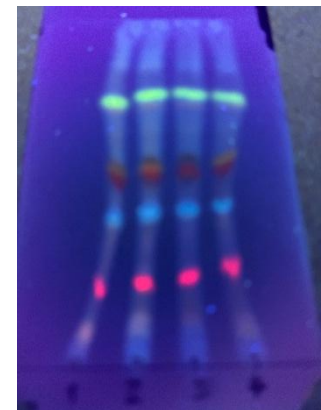
- LCMS-8040 Triple quadrupole LC/MS/MS
- LCMS-9030 Quadrupole time-of-flight (Q-TOF) mass spectrometer



Laboratory of Medicinal Chemistry

Services:

- Optimization of bioactive compounds, also known as "hit to lead"
- Chemical synthesis, semi-synthesis, biocatalysis and biosynthesis
 - E.g. for difficult to make natural products analogues
 - Dedicated compound libraries
 - Scaling up production of natural compound analogues
- Process automation
- Automated isolation and purification of chemical compounds - from biological material or enzymatic reactions
- Qualitative and quantitative analysis of secondary metabolites



Laboratory of Medicinal Chemistry

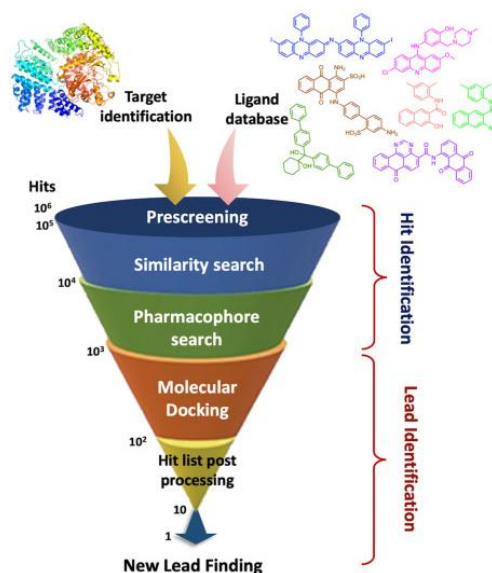
Services:

- Design and synthesis of RNA using chemical and biochemical methods along with structural and functional characterization of RNA molecules to understand their role in biological processes (**Dr. Leszek Błaszczyk**)
- Synthesis of purine and pyrimidine base-modified or/and sugar-modified nucleoside analogues, 1,2,3-triazole nucleosides, as well as quaternary ammonium salts, focused on compounds with required physicochemical properties and potential biological activities (**Dr. hab. Tomasz Ostrowski, Dr. Grzegorz Framski**)

Laboratory of Medicinal Chemistry

Chemoinformatics Services:

- Virtual ligand and structure-based screening
- Structure-Activity Relationship (SAR) analysis
 - Clustering
 - Structural alerts
- Quantitative SAR (QSAR) modelling
 - Fingerprints and descriptors
 - Target binding
 - Physico-chemical properties (log P, solubility)
- Developing pipelines and workflows for data analysis
 - Cell Painting
 - Hit discovery campaigns
- *In silico* toxicity profiling
- ADME and physico-chemical properties prediction
- Data collation, curation and mining
- Structure standardisation and format conversion
- App development
 - Structure and data visualisation
 - Integration of chemoinformatics cartridges into databases



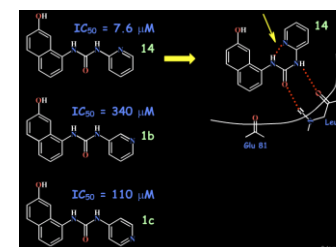
Open for Innovation
KNIME



Chemistry Development Kit

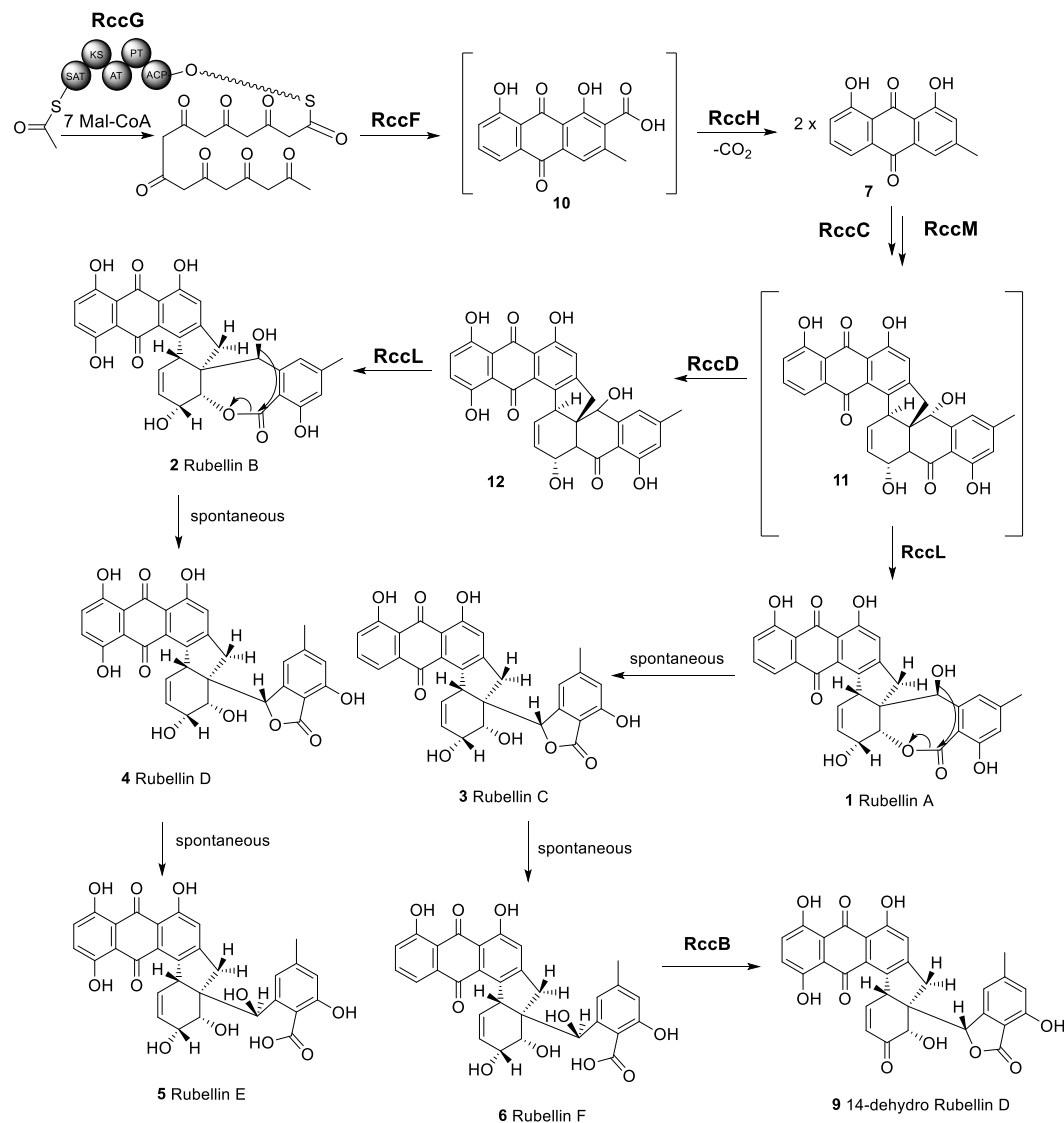
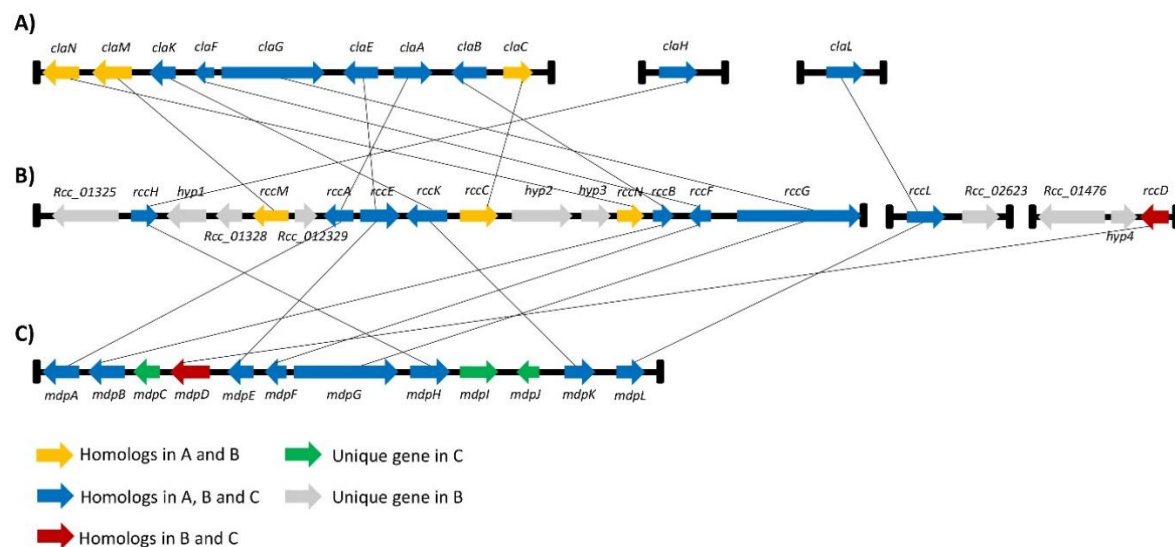


QSAR TOOLBOX



OUR TECHNOLOGY: chemical programming of microorganisms

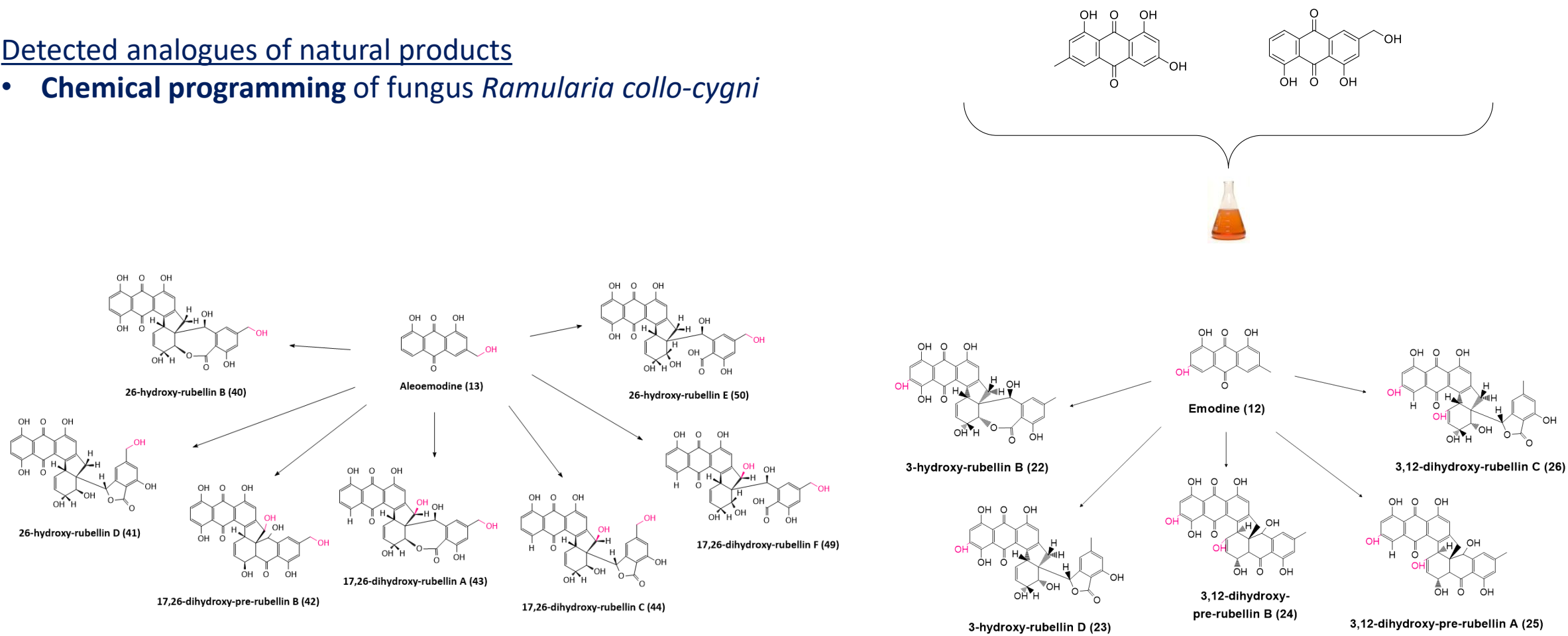
Proposed pathway and discovered gene cluster for rubellins biosynthesis



OUR TECHNOLOGY: chemical programming of microorganisms

Detected analogues of natural products

- Chemical programming of fungus *Ramularia collo-cygni*



List of projects

Project title	Project PI	Project duration	Financing institution	Related to EU-OS [Y/N]
POL-OPENSSCREEN 2.0 - Maintenance, Development and Sharing of the Polish Screening Infrastructure Platform for Biological Chemistry, in view of the Participation in the EU-OPENSSCREEN ERIC Research Infrastructure Consortium - Co-financed by the Minister of Science program "Support for the participation of Polish research teams in international research infrastructure projects	Dorota Kwiatek-Rożek, PhD Project leader - IBM PAS - Prof. dr hab. Zbigniew Leśnikowski)	2024-2028	MNiSW	Y
POL-OPENSSCREEN - FENG.02.04-IP.04-0010/24-00 - Project of the Polish Platform of Screening Infrastructure for Biological Chemistry, which is part of the EU-OPENSSCREEN (European Infrastructure of Open Screening Platforms for Chemical Biology European Research Infrastructure Consortium). Financed by the Ministry of Science and Higher Education	Dorota Jakubczyk, PhD Project leader - IBM PAS - Prof. dr hab. Jarosław Dziadek	2025-2027	MNiSW	Y
IMPULSE - IMProving User experience, Long-term sustainability and Services of EU-OPENSSCREEN; EU Horizon Europe program, HORIZON-INFRA-2023-DEV-01, No. 101132028	Jacek Kolanowski, PhD, DSc	2024-2027	EU Commission	Y
Comprehensive structural and functional analysis of p53 mRNA to identify secondary and tertiary RNA structures important in physiology, carcinogenesis, and development of therapies against human diseases OPUS 2024/53/B/NZ5/01942	Leszek Błaszczyk, PhD	2025-2029	NCN	N

List of user projects and services

Project title / Project No.	Project PI	Project duration	Financing institution
Inhibition of S-adenosyl-L-homocysteine hydrolase from <i>Pseudomonas aeruginosa</i> by targeting the enzyme dynamics SONATA BIS 2018/30/E/NZ1/00729 and B.SUB.24.314	Krzysztof Brzeziński, PhD, DSc, Prof. Marta Eliza Plonska-Brzezinska	2022-2024	NCN, MNiSW
Project Caged bioluminogenic substrates for a selective molecular imaging of biochemical parameters in cancer Sonata 2017/26/D/NZ1/01234	Jacek Kolanowski, PhD, DSc	2022-2024	NCN
Novel genetic factors in plant-bacterial interactions for improved plant iron nutrition Project ID: 390686111	Prof. Paul Schulze-Lefert	2022-2023	DFG
Synthesis, isolation, and characterization of glutathione sulfonamide SONATA BIS 2017/26/E/NZ4/00226	Prof. Magdalena Arasimowicz-Jelonek	2022-2024	NCN
Search for Inhibitors of Human δ 1-Pyrroline-5-Carboxylate Reductase 1 (PYCR1) as Lead Molecules for the Development of Novel Anticancer Drugs OPUS 2021/43/B/NZ7/01611	Miłosz Ruszkowski, PhD, DSc	2023	NCN
ALS-linked U7 snRNA mislocalization leads to retrotransposon activation. 24-SGP-698 The ALS Association Seed Grants Program	Dorota Raczyńska, PhD	2023-2024	ALS
A groundbreaking service for discovering new small molecule drugs targeting mRNA for incurable diseases FENG.01.01-IP.02-1256/23	Molecure S.A.	2023-2028	MNiSW
Obtaining two Dicer ribonuclease variants of the model organism <i>Xenopus laevis</i> – preparation for biochemical activity studies and structural analyses MINIATURA 2024/08/X/NZ1/00899	Agnieszka Szczepańska, PhD	2024-2025	NCN
Thiophene ring opening reaction as a tool for the synthesis of bioactive caffeine derivatives MINIATURA 2023/07/X/ST5/00977	Arleta Sierakowska, PhD	2025	NCN
Design and Development of Serine Hydroxymethyltransferase-2 (SHMT2) Inhibitors Blocking Tumor Growth SONATA BIS 2023/50/E/NZ7/00501/NCN	Miłosz Ruszkowski, PhD DSc	2024-2029	NCN
Searching for new markers of oxidative stress in plant cells - identification of glutathione sulfonamide	Joanna Gajewska, PhD	2026	Voucher MNiSW

Get in touch with us 😊

Laboratory of Medicinal Chemistry

Other services types of the Centre:

Grant proposal preparation

Experiment design

Sample preparation or supervision

Data analysis

Dr. Dorota Jakubczyk

djakubczyk@ibch.poznan.pl

tel. 1165, room 117E

Webpages:

<https://chembio.pl/>

<https://portal.ichb.pl/pracownia-chemii-medycznej/>



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Head of Laboratory

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Dr. Leszek Błaszczyk
adiunkt



Dr. hab. Tomasz Ostrowski
adiunkt



Dr. Przemysław Piechota
adiunkt



Dr. Monika Józwiak
adiunkt



Dr. Grzegorz Framski
główny specjalista ds.
środowiskowej aparatury
badawczej



Piotr Michałowski
PhD student



INSTYTUT CHEMII BIOORGANICZNEJ
Polskiej Akademii Nauk

Presentation on the activities taken by **the Research Support Unit** in 2025

Katarzyna Chojnacka

Poznań, 26.03.2025

Agenda



INSTYTUT CHEMII BIOORGANICZNEJ
Polskiej Akademii Nauk

- Personnel
- Statutory tasks
- Non-statutory tasks
 - ✓ scientific
 - ✓ non-scientific
- Potential
- Challenges

Personnel*



INSTYTUT CHEMII BIOORGANICZNEJ
Polskiej Akademii Nauk

Name and surname	Position	Supported units
Katarzyna Chojnacka	Head of the unit, biology specialist	4
Magdalena Alejska, PhD	senior biology specialist	5
Grzegorz Framski, PhD	chief specialist for environmental research equipment, chemical safety inspector	2
Iwona Gawrońska	biologist	1
Michał Gładysz, PhD	senior chemistry specialist	3
Zofia Jahnz-Wechmann, PhD	senior chemistry specialist	1
Alina Kasperska	biology specialist	6
Sylwia Kuczevska	biology specialist	6
Monika Przybył, PhD	senior biology specialist	4
Paula Sobieszczńska	biology specialist	4
Katarzyna Solka	biology specialist	5
Anna Teubert	chemistry specialist	2

* 31.12.2025

Statutory tasks

- Providing **organizational support** to PIs in the functioning of their departments, specialized laboratories, and teams.
- Supervising and coordinating the **implementation** process of projects within the organizational context, from the submission stage of the PI's application for planned project participation to its completion and the presentation of the final report.
- Overseeing and coordinating the **expenditure** process during project implementation.
- Monitoring and coordinating the fulfillment of **orders** for projects and departments, including orders for chemicals, materials, apparatus, services, office supplies, computer supplies, conference fees, open access fees, and others.

Number of supported projects*

Name and surname	Number of supported project	Supported units
Katarzyna Chojnacka	8	4
Magdalena Alejska, PhD	13	5
Grzegorz Framski, PhD	1	2
Iwona Gawrońska	1	1
Michał Gładysz, PhD	5	3
Zofia Jahnz-Wechmann, PhD	3	1
Alina Kasperska	19	6
Sylwia Kuczevska	14	6
Monika Przybył, PhD	7	4
Paula Sobieszczańska	11	4
Katarzyna Solka	5	5
Anna Teubert	5	2



INSTYTUT CHEMII BIOORGANICZNEJ
Polskiej Akademii Nauk

* 31.12.2025

The most important achievement

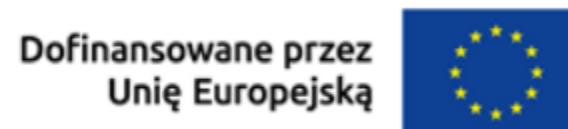
Aim: Development of the internationalization of the IBCH PAS through the implementation of short-term academic exchanges

Participants: students (10), PhD students (40), Staff (15)

Timeframe: 1.10.2025 - 30.09.2026

Funding: 669,920.00 PLN (NAWA)

Status: in progress



Welcome Point

Katarzyna Chojnacka, Michał Gładysz, Monika Przybył, Katarzyna Solka, Sylwia Kuczevska

1. Supporting international employees and doctoral students in the **relocation** process and during their stay in Poland
2. Coordinating **cooperation** between internal units of IBCH PAS in the scope of activities supporting internationalization
3. Collaboration with the Working Group for HR Excellence in Research at IBCH PAS in the **implementation** of activities within the framework of the internationalization strategy and the HR Excellence Action Plan
4. **Collaboration** with organizations supporting the internationalization of science, including the Euraxess network
5. **Monitoring** current trends in the internationalization of scientific units.
6. **Reporting** on the implementation of activities to the IBCH PAS Directorate and authorized external units

Welcome Point

Euraxess standard	2024	2025
Access to the culture of the host country/language courses	0	0
Accommodation	26	9
Banking	7	0
Career Development	0	5
Day care, schooling & family related issues	6	0
Departure conditions/formalities	4	2
Dual career	0	2
Entry conditions/visas	14	11
Health insurance	2	9
HRS4R	3	8
Intellectual Property Rights	4	0
Job opportunities	3	0
Medical care	13	0
Pension rights	0	0
Recognition of diplomas	0	0
Research funding opportunities	3	0
Research Landscape	0	2
Taxation/salaries	9	2
Unemployment	0	0
Work permit	7	13
Administrative support	45	24
Total	146	87

The most important **achievements**:

I. NAWA- Euraxess *One regione, wide horizons- Euraxess Wielkopolska*

Aim: developing a friendly institutional environment in Greater Poland for international PhD students, researchers and their families

Funds: 829.995 PLN (for IBCH PAS: 59,802.50 PLN)

II. Cooperation with with the voivodeship office cooperation with the voivodeship office and obtaining direct support for our international employees, in matters concerning TRC



Non-statutory tasks

Supporting:

- scientific events: **BIO2025 Congress** (17-20.09.2025, Katarzyna Chojnacka),
- non-scientific events: **Science and Art Festival** (4-12.04.2025, Grzegorz Framski, Michał Gładysz), **Open Doors** (5.06.2025, Katarzyna Chojnacka, Michał Gładysz, Monika Przybył, Katarzyna Solka), **Researchers' Night** (26.09.2025, Katarzyna Chojnacka, Monika Przybył, Katarzyna Solka),

Coordinating:

- Freezer Challenge 2025 (Katarzyna Solka)
- integration meetings: *Coffee Club: Bring Your Own Cup, Afternoon Puzzles, Popcorn, and Board Games* (Katarzyna Solka, Michał Gładysz)

Organizing workshops:

- *Alternative career paths* within Open Doors (Katarzyna Chojnacka, Michał Gładysz, Monika Przybył, Katarzyna Solka)



Mobilities/Staff exchange programmes

- Participation in IMPULSE staff exchange in EU-OPENSREEN (Michał Gładysz)
- Oral presentation as part of the BESTPRAC Thematic group meeting, Bridging the Gap: Project Managers and Research Support Teams in Action, entitled "Supporting Researchers and Projects: A valuable and unique model in Poland", 28-29.10.2025, Barcelona (Katarzyna Chojnacka)
- Participation in the online study visit: "Career outside academia for researchers" (9.09.2025, Katarzyna Chojnacka)
- Participation in the EARMA mentorship scheme program (Michał Gładysz)

Papers

Best Practices for Freezer Efficiency

Exploring strategies to help your lab meet its sustainability targets through efficient cold storage management

Written by Katarzyna Solka, MSc

Feb 27, 2025 | 4 min read

<https://www.labmanager.com/best-practices-for-freezer-efficiency-33614>

Effective Problem-Solving Techniques for Lab Managers

Unlock the power of problem-solving strategies to overcome complex challenges

Written by Katarzyna Solka, MSc

Updated May 6, 2025 | 2 min read

<https://www.labmanager.com/effective-problem-solving-techniques-for-lab-managers-33946>

Potential

Competences:

1. Horizon Europe Management Workshop (EU-Openscreen)- Michał Gładysz
2. AI AIDEAS- Katarzyna Solka, Michał Gładysz
3. CARDEA Academy for Research Managers- Katarzyna: Chojnacka & Solka
4. Scientific research in medical sciences - clinical trials and medical experiments (Clinical Research and Translational Medicine Support Center, Wrocław)- Katarzyna Chojnacka
5. ICH E6 (R2, R3) Good Clinical Practice ver. 1.0 (ABM)- Katarzyna Chojnacka

Previously acquired:

- Horizon Europe Framework Programme Manager's Academy (KPK, NCBR)- Katarzyna Chojnacka, Michał Gładysz, Monika Przybył, Katarzyna Solka
- „Everything you need to know about submitting a European multinational Clinical Study Proposal” (ECRIN)- Katarzyna Chojnacka, Michał Gładysz
- Project management- K. Chojnacka, M. Gładysz, S. Kuczevska, M. Przybył, P. Sobieszczańska, K. Solka
- AGILE- Michał Gładysz, - PRINCE- Katarzyna Chojnacka, Michał Gładysz

Challenges



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Name and surname*	Employment In the RSU	Employment in the research unit	Secondment	Supported projects (research+stat utory)
Katarzyna Chojnacka	1			12
Magdalena Alejska, PhD	0.75	0.25		18
Grzegorz Framski, PhD	0.1		0.9	3
Iwona Gawrońska				2
Michał Gładysz, PhD	0.1		0.9	8
Zofia Jahnz-Wechmann, PhD	0.1	0.9		4
Alina Kasperska	0.2	0.8		25
Sylwia Kuczevska	0.5	0.5		20
Monika Przybył, PhD	1			11
Paula Sobieszczańska	0.75		0.25	15
Katarzyna Solka	1			10
Anna Teubert	0.5	0.5		7

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Thank you for your attention

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