

Oleksandr Petrenko

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@ oleksandr.petrenko@mutation.me +43 676 420 68 37
ID orcid.org/0000-0002-8586-4910 github.com/xander-p
in linkedin.com/in/xander-petrenko Vienna, Austria

A physician-scientist with expertise in systems biology, multi-omics, and medical genetics. Combines skillset in computational biology and wet/experimental lab. Experienced in target and biomarker discovery on experimental and primary patient material.

Work experience

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| Current October 2024 | Project Scientist @ Medical University of Vienna <ul style="list-style-type: none">➤ Joined Dr. Tim Hendrikk's lab to work on systems biology in steatotic liver disease. |
| September 2024 August 2019 | Researcher (Wissenschaftlicher Mitarbeiter) @ Medical University of Vienna <ul style="list-style-type: none">➤ Joined the laboratory of Prof. Thomas Reiberger as a PhD student, co-affiliated with the CeMM Research Center for Molecular Medicine and Ludwig Boltzmann Institute for Rare and Undiagnosed Diseases. Thesis title: "Systems Biology and Molecular Interaction Networks in Liver Disease".➤ Extended ongoing translational studies with omics for biomarker discovery (RNA-seq, metabolomics, proteomics); designed and led a study on target identification with a heavy focus on single-cell transcriptomics, extracellular matrix biology, and multiomics in a rare liver disease.➤ Established prospective study for primary human hepatic cell isolation & biobanking from resected and explanted livers.➤ Planned and conducted projects up to publication as a working package leader in grant collaboration with Boehringer Ingelheim.➤ Performed internal training and supervision in bioinformatics and -omics data analysis.➤ Developed the group's website and online tools supplementing studies, curated generated -omics data, including repositioning on public databases.➤ Contributed to institutional activities, such as "Pro Rare Austria", "European Researcher's Night", and Scientific Advisory Board meetings. |
| July 2019 August 2017 | Medical Resident in General Practice - Family Medicine @ Kyiv Medical University <ul style="list-style-type: none">➤ Performed supervised clinical work. Partial focus on genetic counseling and pediatric patients with suspected genetic conditions.➤ August 2017 - September 2018 - "Into-Sana" Hospital (inpatient). October 2018 - June 2019 - Odesa Specialized Center for Medical Genetics (outpatient). |
| August 2018 February 2017 | Chief Innovation Officer @ Reproductive Health Center "Lada" <ul style="list-style-type: none">➤ Developed local guidelines and a logistical chain, which allowed the application of preimplantation genetic testing of human embryos.➤ Expanded business opportunities with medical tourism, which attracted patients from global destinations.➤ Updated biobanking infrastructure for gamete donations and gestational carriers.➤ Participated in preparations for successful independent audit for ISO 9001:2015 certification.➤ Developed business intelligence approach for real-time effectiveness tracking of IVF programs.➤ Established a partnership with BMJ Learning and supervised the lifelong education of medical personnel.➤ Established contacts with a local representative of IFMSA and successfully supervised an exchange student. |

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| February 2017 | Junior Clinical Embryologist @ Reproductive Health Center "Lada" |
| July 2016 | |
| | <ul style="list-style-type: none"> Received hands-on training with human gametes and embryos and relevant techniques (IVF, ICSI, gametes grading, cryopreservation, WHO 2010 semen analysis, laser-assisted biopsies) and performed supervised lab work in the IVF unit. |

Education & Training

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| Current | Department of Gastroenterology & Hepatology, Medical University of Vienna, Austria |
| August 2019 | PhD Student in Vascular Biology (UN094 program) |
| December 2019 | Laboratory of Jörg Menche, CeMM Research Center for Molecular Medicine, Austria |
| November 2019 | Rotation student in network medicine |
| September 2018 | Emergency Hospital, Carol Davila University of Medicine and Pharmacy, Romania |
| August 2018 | Exchange student in flow cytometry and molecular biology (hematology) |
| November 2014 | Department of Pharmacology, Odesa National Medical University, Ukraine |
| June 2014 | Research intern in acute and chronic animal toxicity studies |
| June 2016 | Medical Faculty #2, Odesa National Medical University, Ukraine |
| August 2010 | Master's Degree in General Medicine (M.D.) |

Competences


Systems biology Biological networks , Molecular and cells interactions ,
 Targets and biomarkers discovery , Extracellular matrix research ,
 Molecular docking , Literature topic modeling and language models ,
 Public databases , Data visualization .

Omics data analysis Raw data pre-processing WES and WGS , Bulk RNA-seq , scRNA-seq ,
 10x Visium HD , LC-MS proteomics & metabolomics ,
 Multiomics integration , Machine learning Snakemake pipelines .

Pathology Imaging Mass Cytometry , IHC , Immunofluorescence ,
 Whole slide segmentation & feature quantification ,
 Second-harmonic microscopy .

In vitro Cell culture and treatment , Cell counting & viability assays ,
 Tissue dissociation , DNA, RNA, and protein isolation ,
 Preparation of tissue scaffolds , IVF techniques , Cell microinjections ,
 Magnetic-activated cell sorting , Flow cytometry , Biobanking

In vivo Handling of adult rodents , Gavage techniques , Animal injections ,
 Organ perfusion and dissociation . Rodents anesthesia & surgery assistance ,
 Acute toxicity assessment , Open field test , Calculation of LD₅₀

Computers  Linux , Git , SSH , Bash , Python , R , API , Parsing ,
 Virtual machines , Relational databases , Cytoscape , HALO , ImageJ .

Graphics Adobe Illustrator & Inkscape (vector) , BioRender , Video editing

Other Evidence-based medicine , Public talks , Science communication

☰ Selected works

- › G. Semmler*, O. Petrenko*, J. J. Lozano, et al. **Metabolomic profiles differentiate between porto-sinusoidal vascular disorder, liver cirrhosis, and healthy individuals**, JHEP Reports. 2024.
Access: <https://doi.org/10.1016/j.jhepr.2024.101208>
- › O. Petrenko, C. Mangana, T. Sorz et al. **Deciphering of hepatic single-cell interactome in primary sclerosing cholangitis**, Zenodo.
Access: <https://doi.org/10.5281/zenodo.10279866> (poster). Manuscript in preparation.
- › O. Petrenko, P. Königshofer, B. Hofer et al. **Transcriptomic signatures of progressive and regressive liver fibrosis and portal hypertension**, iScience 2024.
Access: <https://doi.org/10.1016/j.isci.2024.109301>.
- › J. Reiniš*, O. Petrenko*, B. Simbrunner, et al. **Assessment of portal hypertension severity using machine learning models in patients with compensated cirrhosis**, J Hepatol. 2023.
Access: <https://doi.org/10.1016/j.jhep.2022.09.012>
- › P. Königshofer, B. Hofer, K. Brusilovskaya, B. Simbrunner, O. Petrenko, et al. **Distinct structural and dynamic components of portal hypertension in different animal models and human liver disease etiologies**, Hepatology 2022.
Access: <https://doi.org/10.1002/hep.32220>

🏆 Leadership & Awards

Research

- › **January 2024**: The web application for laboratory-based prediction of portal hypertension risk, developed as a supplementary tool for the JHEP manuscript to assist clinicians (10.1016/j.jhep.2022.09.012), reached 1500 unique users: <https://liver.at/vlsg/hvpg-calculator/>.
- › **November 2023**: Received the Early Career Investigator Award in Basic Science from the American Association for the Study of Liver Diseases Foundation for research in primary sclerosing cholangitis.
- › **May 2023**: Secured funding from the U.S. Department of State, The Science and Technology Center in Ukraine & their partners to research multiomic signature of lifespan and diet in a dros
- › **March 2023**: Awarded with EASL Young Investigator bursary to present work on target discovery in primary sclerosing cholangitis at EASL Biliary Fibrosis-2023.
- › **April 2022**: Awarded with EASL Young Investigator bursary for work on hepatic interactome in end-stage liver disease, presented at ILC-2022.
- › **May 2019**: Received an offer in a highly competitive program of the CeMM Research Center for Molecular Medicine (12 offers out of 700 applications) and obtained funding from the Ludwig Boltzmann Institute for Rare and Undiagnosed Diseases.

Pro bono & other

- › **October 2023**: Developed and coordinated a practical course on RNA-seq data analysis. The course attracted 130 participants (Ukrainian students and early career scientists) with 35% completion rate, including 5 certificates for supervised capstone projects on real-life experimental data.
- › **November 2021**: Selected for and completed the UN Shadowing Programme by The United Nations Scientific Committee on the Effects of Atomic Radiation.
- › **August 2021**: Appointed as an HPC Data Manager for several CeMM groups (two-year term).
- › **February 2021**: Elected as a CeMM PhD representative (one-year term).
- › **December 2018**: Co-founded "Genomics UA", a non-governmental organization to promote the application of omics in Ukrainian research, industrial, and clinical sectors. Our single-cell school attracted more than 1000 registrations worldwide. I contribute to external affairs and developing course curricula.
- › **August 2017**: Tutored an exchange medical student from Brazil (IFMSA Professional Exchanges).
- › **August 2016**: Co-founded a local branch of the science communication project "15x4". In the following years, we regularly hosted events, and I was elected to preview biomedicine-related talks.
- › **August 2016**: Co-founded platform for medical students "Med HUB Odesa". We operated until late 2017 and hosted several events with invited speakers, such as case studies, the Medical English club, and pre-

clinical lectures.

- › **July 2016:** Received “Many Languages – One World” Essay Contest Award, organized by ELS Educational Services, Inc. and the United Nations Academic Impact. After being selected among 60 finalists out of 3500 participants, I joined the working group on Sustainable Development Goal #16 (“Promote just, peaceful and inclusive societies”). Later, we presented the results at the UN General Assembly in New York.
- › **March 2016:** Semifinalist of the National Parliamentary Debate tournament.
- › **September 2014:** Elected as the Chair of the Students’ Scientific Club on Pathology (two-year term).

Reviewing activity

Ad hoc for the following journals:

- › BMC Gastroenterology.
- › Frontiers in Bioscience-Landmark.
- › JHEP Reports.

Languages

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| Ukrainian | Native. |
| Russian | Native. |
| English | Fluent. |
| German | Intermediate. |

Science communication

- › **Genomic science in Ukraine: is it in our DNA?** (UA).
Access: <https://mutation.me/genomics-in-ukraine>
- › **Interview about preimplantation genetic testing** (EN).
Access: <https://mutation.me/interview-berezovska-pgd>
- › **Genetic podcast: careers in Ukraine** (UA).
Access: <https://mutation.me/genna-sluhanka-1>
- › **Check thy evidence: ibuprofen menace (or not)** (EN).
Access: <https://mutation.me/check-thy-evidence-ibuprofen>
- › **Diagnostic odyssey of patients with mitochondrial diseases. Information about the diagnosis, about those who diagnose, and some numbers** (EN).
Access: <https://mutation.me/diagnostic-odyssey-mito>
- › **Proteomic assay for Fabry disease** (EN).
Access: <https://mutation.me/proteomic-assay-for-fabry-disease>
- › **Zika Virus: infected cells and their transcriptome** (EN).
Access: <https://mutation.me/zika-virus-infected-cells-and-their-transcriptome>
- › **Nobel Prize 2018 in Medicine: what is it for and why it may help us** (RU).
Access: <https://www.prostranstvo.media/nobelevskaja-premija-2018/>
- › **The first genetic engineering children were born in China. And it causes questions** (RU).
Access: <https://www.prostranstvo.media/v-kitae-rodilis-geneticheski-modificirovannye-deti/>