

Sviatoslav Kharuk

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EDUCATION

Masters of Biochemistry at Vasyl Stefanyk Precarpathian National University

September 2023 – December 2024

Diploma topic: "Investigating batch effect and cell fate dynamics in the *Drosophila melanogaster* intestine using single-cell RNA velocity"

Supervisor: Wolfgang Huber

Related publication: Proliferation and differentiation of intestinal stem cells depends on the zinc finger transcription factor BCL11/Chronophage. Siamak Redhai*, Nick Hirschmüller*, Tianyu Wang, Shivohum Bahuguna, Svenja Leible, Stefan Peidli, Erica Valentini, **Sviatoslav Kharuk**, Michaela Holzem, Lea Bräckow, Fillip Port, David Ibberson, Wolfgang Huber, and Michael Boutros. bioRxiv, September 2024.

DOI:10.1101/2024.09.08.611891

Bachelors of Biochemistry at Vasyl Stefanyk Precarpathian National University (with Honors)

Diploma topic: "Effect of peptides amino acid sequence on the efficiency of intranasal delivery to the mouse brain".

Thesis topic: "Effect of early life starvation on metabolism in *Drosophila melanogaster*"

Supervisor: Oleh Lushchak (Scopus - <https://bit.ly/3F6Oyvw>)

September 2019 – June 2023

Major courses: Fundamentals of scientific research, Biochemistry, Cell Biology, Molecular Biology

Key courses: Immunology, Bioinformatics, Microbiology, Virology and Metabolic Pathways in Biology.

GPA: 3.8/4.0

ADDITIONAL TRAINING

- July 2024
- ◆ **Attending the Ukrainian Biological Data Science Summer School (UBDS`3) in Uzhhorod, Ukraine as a teacher assistant** (<https://www.bds3.org>).
 - November – December 2023
- ◆ **Completed the practical course "Essential Biostatistics in Biomedical Research" as a part of Bioinformatics for Ukraine Initiative** (certificate <https://shorturl.at/kJPY5>)
 - September – October 2023
- ◆ **Completed the practical course with the capstone project analysis of RNA-sequencing data: from transcripts to biological insights** (certificate <https://shorturl.at/bLMNP>)
 - August 2023
- ◆ **Completed "Bioinformatics for Biologists: An Introduction to Linux, Bash Scripting, and R" course** (certificate: <https://shorturl.at/>)
 - July 2023
- ◆ **Attending the Biological Data Science Summer School in Uzhhorod, Ukraine** (bit.ly/3Z2l6RC).
 - May 2023
- ◆ **Completed "Biological Data Science" Workshop as a part of Bioinformatics for Ukraine Initiative.** Colab notebook: <https://shorturl.at/AIKL6>, certificate: <https://shorturl.at/clrBC>
 - September – November 2022
- ◆ **Completed the "Bioinformatics" course from DAAD.**
Certificate and more information - <https://bit.ly/3iKMlyX>

RESEARCH EXPERIENCE

- ◆ **Vasyl Stefanyk Precarpathian National University of Ukraine**
 - September 2022 – June 2023
- Studying the intranasal administration of peptides to the brain in *Mus Musculus*. Investigating of the amino acid sequence of peptides for effective delivery to the brain of mice through the nasal cavity
- Research design:
- Intranasal administration of peptides through nose (N2B drug delivery)
 - Dissection
 - Fluorescence spectroscopy
- Supervisor: Volodymyr Shvadchak (Orcid- <https://bit.ly/3IEQG1D>)
- November 2019 – June 2022

Investigating lifespan and aging of *Drosophila melanogaster*. A study of the behavior of *D. melanogaster* in the conditions of starvation in the early stages of development.

Research design:

- Counting the rate of fruit fly development
- Investigating lifespan and fecundity
- Determination of food consumption (carbs and proteins) using the CAFE (Capillary Feeding) method
- Determination of the resistance to stress factors (starvation and oxidative (menadione) resistance)
- Measuring the content of metabolites (glycogen, glucose, TAG and protein)

Supervisor: Oleh Lushchak (Scopus - <https://bit.ly/3F6Oyvw>)

INTERNSHIPS

❖ EMBL

Remote internship

December 2023 - now

Single-cell RNA velocity inferring of perturbation data

Supervisor: Wolfgang Huber (<https://shorturl.at/lpBG5>)

❖ Explogen LLC

On-site internship

July 2022 – July 2022

Genome assembling, DNA extraction, DNA electrophoresis, PCR, Plasmid Isolation, Bacterial Culturing, Fosmid library construction.

❖ Universitätsklinikum Münster

Remote internship

June 2022 – July 2022

ChIP-seq and RNA-seq analysis

Supervisor: Sebastian T Balbach (ResearchGate - <https://bit.ly/3Ai9dMY>)

HARD SKILLS

- **Bioinformatics skills (Bioinformatics university course, self-study):**
 - Working with the command line on Linux (certificates (bit.ly/3R37SBZ, <https://bit.ly/3rWNjtN>):
 - Bash (FastQC, BWA-MEM, Samtools, Bcftools).
 - File formats: FASTQ, SAM/BAM, VCF.
 - Shell scripting (automating variant calling workflow for QC analysis and calling variants)
 - **Programming:**
 - Python (biopython, pandas, seaborn, matplotlib, streamlit) (GitHub - <https://github.com/sviatkh>)
 - Analysis in Galaxy: ChIP-seq, QC using FastQC, Sequence trimming, Mapping.
 - Visualization of genomic data using Integrative Genomics Viewer.
- **Statistical analysis of the experimental data:**
 - RNA-seq analysis in R (certificate - <https://bit.ly/47eEbTt>)
 - Python (Data analysis, plotting graphs (Pandas, seaborn, matplotlib))
 - GraphPad Prism
- **Experimental Design**
 - Ability to design and plan experiments effectively, including formulating hypotheses, selecting appropriate controls, determining sample sizes, and optimizing experimental conditions.
- **Literature Review**
 - Proficient in conducting literature searches, critically analyzing scientific literature, and staying updated with the latest research developments.
- **Laboratory Instrumentation**
 - Experience with operating and maintaining various scientific instruments and equipment, such as spectrometers, fluorimeters, centrifuges, light microscopes.
- **Biochemistry assays (*Drosophila*)**
 - Measuring metabolites (glucose, glycogen, triacylglycerols)
 - Analysis of enzyme activity (catalase, aconitase)
- **Physiology (*Drosophila*)**
 - Counting the rate of fruit fly development
 - Determination of food consumption (carbs and proteins) using the CAFE (Capillary Feeding) method
 - Determination of the resistance to stress factors (starvation and oxidative (menadione) resistance)
- **Molecular Biology techniques (Microorganisms and *Drosophila*)**
 - DNA extraction, DNA electrophoresis, PCR, Plasmid Isolation, Bacterial Culturing, Fosmid library construction, Western Blot.

SOFT SKILLS

- Self-management
- The ability to study independently
- Decision making

VOLUNTEER EXPERIENCE

10th December, 2022

The School of Young Biochemist at the Department of Biochemistry and Biotechnology

o By using hands-on experiences and engaging talks and events, the aim of this school is to make science exciting, understandable, and relevant to young pupils. Task: capturing, moments, scientific experiments by photo.

14th March, 2020

o “Balkan Race Walking Championships 2020”. Task: Transporting the results to the judges on time by bicycle.

3rd December, 2020

o Completed training of students in health measurements and feedback within the project “Personalized prevention tools in obesity and diabetes – a joint Romanian-Ukrainian programme of health education” (PrePOD). Ivano-Frankivsk, Ukraine. (<https://bit.ly/3ksIXWZ>)

CONFERENCES

4th April, 2021

o “Eating behavior of females *D. melanogaster* is induced by starvation on larvae state”. Reporting and scientific conference of students. Vasyl Stefanyk Precarpathian National University, Ivano Frankivsk, Ukraine. Oral-speech.

22-24th October 2021

o Passed the selection and took part in scientific and practical intensive organized by two companies “Explogen LLC” and “Enzym” which are involved in the fields of synthetic biology, metabolic engineering of microorganisms, genomics, bioinformatics and biotechnology, respectively.

29th October, 2021

o Obtained a personal academic scholarship of Believe in Yourself Foundation (<https://bit.ly/3LzDKSi>).

7th April, 2022

o “Effect of early life starvation on metabolism in *Drosophila melanogaster*”. Reporting and scientific conference of students. Vasyl Stefanyk Precarpathian National University. Ivano Frankivsk, Ukraine. Oral-speech (<https://bit.ly/3rVtR0v> - in Ukrainian).

20th June, 2022

o “Effect of early life starvation on metabolism in *Drosophila melanogaster*”. Term thesis defense. Vasyl Stefanyk Precarpathian National University. Ivano Frankivsk, Ukraine. Oral-speech (<https://bit.ly/3rVtR0v> - in Ukrainian).

4-6th November, 2022

o Passed the selection and took part in scientific and practical intensive organized by biotechnology company “Enzym” which is involved in the field of biotechnology.

24th March, 2023

o “Study of intranasal delivery of peptides to the brain of mice”. 92nd Scientific and Practical Conference of Students and Young Scientists with International Participation "Innovation in Medicine and Pharmacy", 1-st place for poster presentation. Ivano-Frankivsk, Ukraine.

7th April, 2023

o “Study of intranasal delivery of peptides to the brain of mice”. Reporting and scientific conference of students. Vasyl Stefanyk Precarpathian National University, 2nd place oral-speech presentation. Ivano Frankivsk, Ukraine.

LANGUAGES

English – B2 (Upper-Intermediate)

Ukrainian – Native speaker