

Dennis V. Startsev

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Education

University of Nebraska–Lincoln, Lincoln, NE

Doctor of Philosophy (Ph.D.), Biochemistry – Systems Immunology | Aug 2024 – Present

Dissertation: Multi-scale Mathematical Modeling of Immune Cell Behavior

University of Nebraska–Lincoln, Lincoln, NE

Bachelor of Science, Mathematics | May 2024

Awards & Honors

- STEM CONNECT Scholarship (NSF), 2021 – Present
- Dean's List, UNL, 2020 – Present

Publications

1. Immune Digital Twin Blueprint: A Comprehensive Mechanistic Model of the Human Immune System (2024). Co-author.

Research Experience

University of Nebraska–Lincoln, Helikar Lab | Lincoln, NE

Graduate Researcher, Systems Immunology | Aug 2024 – Present

- Develop multi-scale mathematical models integrating agent-based and ODE frameworks to predict dendritic-cell-mediated immune responses.
- Lead projects on immune digital twin development and immunometabolism, mentoring 3 junior researchers.
- Analyze single-cell RNA-seq datasets and construct signaling and metabolic networks.

Undergraduate Researcher, Biochemistry–Bioinformatics | May 2022 – Aug 2024

- Assisted in literature curation and model construction for the Digital Twin Signaling project.
- Managed a team integrating metabolic and signaling networks.

Selected Projects

- Immune Digital Twin (2022 – Present): mechanistic simulation of human immune responses.
- Immunometabolism (2023 – Present): mapping metabolic rewiring across immune cell subsets.
- Multi-scale Mathematical Modeling of Immune Cell Behavior (2024 – Present): dissertation research integrating signaling, metabolism, and spatial dynamics.

Technical Skills

- Bioinformatics: signaling modeling, metabolic model analysis, single-cell RNA-seq
- Python: NumPy, SciPy, pandas, matplotlib
- Modeling: agent-based (NetLogo), ODE (Python, MATLAB)
- Protein Structural Analysis: PyMOL, AlphaFold2
- Statistical Data Analysis: R, Python (statsmodels, scikit-learn)

Teaching Experience

University of Nebraska–Lincoln, Lincoln, NE

Teaching Assistant, Russian | Aug 2021 – May 2022

Delivered weekly lectures on Russian culture and provided grammar support for RUSS 304 & RUSS 331.

Southeast Community College, Lincoln, NE

Private Tutor, Mathematics | Jan 2020 – Dec 2020

Provided one-on-one exam preparation for Calculus I students.

References

- Dr. Tomas Helikar – thelikar2@unl.edu
- Dr. Jim Lewis – jlewis@unl.edu
- Dr. Sara Aghamiri – aghamiri.s.sara@gmail.com
- Dr. Bhanwar Puniya – puniya.bl@gmail.com