Samuel Sledzieski

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RESEARCH

Flatiron Institute — **New York, NY**
Flatiron Research Fellow, Center for Computational Biology — Sep 2024 – Present

Princeton University — **Princeton, NJ**
Visiting Research Collaborator, Lewis-Sigler Institute for Integrative Genomics — Sep 2024 – Present

Massachusetts Institute of Technology — **Cambridge, MA**
Research Assistant, Computation and Biology Group — Feb 2020 – Aug 2024

Centre Scientifique de Monaco — **Monaco**
Visiting Researcher — Jan 2024 – Feb 2024

Serinus Biosciences — **Cambridge, MA**
Consultant — Feb 2023 – Dec 2023

Microsoft Research — **Redmond, WA**
Research Intern, AI For Good Lab — May 2023 – Oct 2023

Cellarity — **Cambridge, MA**
Machine Learning Intern, Perturbation Biology Group — May 2021 – Aug 2021

MIT Lincoln Laboratory — **Lexington, MA**
Summer Research Program, Advanced Lasercom Systems Group — May 2019 – Aug 2019

University of Connecticut — **Storrs, CT**
Undergraduate Research Assistant, Computational Biology Lab — Jan 2017 – May 2019
Software Developer, Jackson Laboratory for Genomic Medicine — Aug 2018 – May 2019
Undergraduate Research Assistant, Nelson Lab — Oct 2015 – Dec 2016

EDUCATION

Massachusetts Institute of Technology — **Cambridge, MA**
PhD, Computer Science — 2019 – 2024

- Minor in Biological Engineering
- Concentration: Protein language models, protein and drug interactions, protein structure
- Advisor: Dr. Bonnie Berger

SM, Electrical Engineering and Computer Science — 2019 – 2021

University of Connecticut — **Storrs, CT**
BS, Computer Science — 2015 – 2019

- Minor in Molecular and Cellular Biology
- Concentration: Bioinformatics, Data Science
- Advisor: Dr. Mukul Bansal
- Magna Cum Laude, Honors Scholar

TEACHING

Massachusetts Institute of Technology — **Cambridge, MA**
Teaching Assistant, Intro to Deep Learning (6.S191) — Winter 2021, 2022, 2023
Teaching Assistant, Machine Learning in Genomics (6.878) — Fall 2021

University of Connecticut — **Storrs, CT**
Teaching Assistant, Theory of Computation — Spring 2018

JOURNAL

[9] Kshirsagar, Meller, Humphreys, **Sledzieski**, Xu, Dodhia, Horvitz, Berger, Bowman, Lavista Ferres, Baker, Baek, "Rapid and accurate prediction of protein homo-oligomer symmetry," *Nature Communications*, 16(2017), 2025.

[8] Singh, Im, Qiu, Macnkess, Gupta, Sorenson, **Sledzieski**, Erlach, Wendt, Nanfack, Bryson, Berger, "Learning the Language of Antibody Hypervariability," *Proceedings of the National Academy of Sciences*, 122(1):e2418918121, 2024.

[7] **Sledzieski**, Kshirsagar, Baek, Berger, Dodhia, Lavista Ferres, "Democratizing Protein Language Models with Parameter-Efficient Fine-Tuning," *Proceedings of the National Academy of Sciences*, 121(26):e2405840121, 2024.

[6] **Sledzieski***, Devkota*, Singh, Cowen, Berger, "TT3D: Leveraging Pre-Computed Protein Sequence Models to Predict Protein-Protein Interactions," *Bioinformatics*, 39(11):btad663, 2023.

[5] Singh*, **Sledzieski***, Bryson, Cowen, Berger, "Contrastive learning in protein language space predicts interactions between drugs and protein targets," *Proceedings of the National Academy of Sciences*, 120(24):e2220778120, 2023.

[4] Kumar, Brenner, **Sledzieski**, Olaosebikan, Lynn-Goin, Putnam, Yang, Lewinski, Singh, Daniels, Cowen, Klein-Seetharaman, "Transfer of knowledge from model organisms to evolutionarily distant non-model organisms: The coral Pocillopora damicornis membrane signaling receptome," *Plos one*, 18(2):e0270965, 2023.

[3] Zaman*, **Sledzieski***, Wu, Bansal, "virDTL: Viral recombination analysis through phylogenetic reconciliation and its application to sarbecoviruses and SARS-CoV-2," *J Comput Biol*, 30(1):3–20, 2023.

[2] Singh*, Devkota*, **Sledzieski**, Berger, Cowen, "Topsy-Turvy: integrating a global view into sequence-based PPI prediction," *Bioinformatics*, 38(Supplement 1):i264-i272, 2022.

[1] **Sledzieski***, Singh*, Cowen, Berger, "D-SCRIPT translates genome to phenome with sequence-based, structure-aware, genome-scale predictions of protein-protein interactions," *Cell Systems*, 12(10):969-982, 2021.

CONFERENCE AND WORKSHOPS

[6] **Sledzieski**, Versavel, Singh, Ocitti, Devkota, Kumar, Shhpilker, Roger, Yang, Lewinski, Putnam, Berger, Klein-Seetharaman, Cowen, "Decoding the Functional Interactome of Non-Model Organisms with PHILHARMONIC," *Conference on Research in Computational Molecular Biology (RECOMB)*, 2024.

[5] **Sledzieski**, Kshirsagar, Baek, Berger, Dodhia, Lavista Ferres, "Parameter-Efficient Fine-Tuning of Protein Language Models Improves Prediction of Protein-Protein Interactions," *Machine Learning for Structural Biology Workshop at NeurIPS*, 2023.

[4] **Sledzieski***, Singh*, Cowen, Berger, "Contrasting drugs from decoys," *Machine Learning for Structural Biology Workshop at NeurIPS*, 2022.

[3] **Sledzieski***, Singh*, Cowen, Berger, "Adapting Protein Language Models for Rapid Drug-Target Interaction Prediction," *Machine Learning for Structural Biology Workshop at NeurIPS*, 2021.

[2] **Sledzieski***, Singh*, Cowen, Berger, "Sequence-based prediction of protein-protein interactions: a structure-aware interpretable deep learning model," *Conference on Research in Computational Molecular Biology (RECOMB)*, 2021.

[1] **Sledzieski***, Zhang, Mandoiu, Bansal, "TreeFix-TP: Phylogenetic Error Correction for Accurate Reconstruction of Viral Transmission Networks," *Pacific Symposium on Biocomputing (PSB)*, 2021.

PREPRINTS

[3] Ullanat, Jing, **Sledzieski**, Berger, "Learning the language of protein-protein interactions," *bioRxiv*, 2025. 10.1101/2025.03.09.642188v1.

[2] Vizgaudis, Kumar, Olaosebikan, Roger, Brenner, **Sledzieski**, Yang, Lewinski, Singh, Daniels, Cowen, Klein-Seetharaman, "Insulin Signaling and Pharmacology in Corals," *Authorea Preprints*, 2024. 10.22541/au.170666200.07483513/v1.

[1] Kousi, Boix, Park, Mathys, **Sledzieski**, Peng, Bennett, Tsai, Kellis, "Single-cell mosaicism analysis reveals cell-type-specific somatic mutational burden in Alzheimers Dementia," *bioRxiv*, 2022. 10.1101/2022.04.21.489103.

PRESENTATIONS

Cold Spring Harbor Laboratory Meeting on Network Biology	Mar 2021, Mar 2023, Mar 2025
Biophysical Society Annual Meeting (BPS)	Jan 2025
Intelligent Systems for Molecular Biology (ISMB)	Jul 2022, Jul 2023, Jul 2024
Machine Learning in Structural Biology (MLSB) Workshop at NeurIPS	Dec 2021, Dec 2022, Dec 2023
Research on Computational Molecular Biology (RECOMB)	Apr 2019, May 2022, Apr 2025
Pacific Symposium on Biocomputing (PSB)	Jan 2021
IEEE ICCABS Workshop on Computational Advances for Next Generation Sequencing	Oct 2018
UConn Fall Frontiers in Undergraduate Research	Oct 2018
University of Connecticut Bioinformatics Seminar	Mar 2018, Oct 2018

AWARDS & FELLOWSHIPS

Flatiron Postdoctoral Research Fellowship	2024 - 2026
National Science Foundation (NSF) Graduate Research Fellowship	2021 - 2024
First Place, MIT Intro to Deep Learning Final Project Competition	2020
New England Scholar, University of Connecticut	2017 – 2019
Dean's List, College of Liberal Arts and Sciences, School of Engineering	2015 – 2019
Academic Excellence Scholarship, University of Connecticut	2015 – 2019
National Merit Scholarship Finalist	2014

SOFTWARE

D-SCRIPT https://github.com/samsledje/D-SCRIPT
58k+ PyPI downloads

ConPLex https://github.com/samsledje/ConPLex
24k+ PyPI downloads

PHILHARMONIC https://github.com/samsledje/philharmonic
5k+ PyPI downloads

virDTL https://github.com/suz11001/virDTL

TreeFix-TP https://github.com/samsledje/TreeFix-TP

MENTORING

MIT Undergraduate Research Opportunities Program (UROP) Advisor	2021 – 2024
MIT Research Summer Institute (RSI) Advisor	2022 – 2023
HackMIT Mentor	2019 – 2022

PEER REVIEW

Nature, *Nature Methods*, *Nature Communications*, *Nature Biotechnology*, *Current Opinions in Structural Biology*, *Bioinformatics*, *Genome Biology*, *Journal of Computational Biology*, *PLOS Computational Biology*, *IEEE Transactions on Artificial Intelligence*, *NeurIPS, Machine Learning in Structural Biology (MLSB)*, *RECOMB*, *ISMB*

MEMBERSHIPS & ACTIVITIES

International Society for Computational Biology (ISCB)
Institute of Electronics Engineers (IEEE)
Association for Computing Machinery (ACM)
Tau Beta Pi, Engineering Honor Society (TBII)
Eta Kappa Nu (IEEE-HKN)
Upsilon Pi Epsilon, Computer Science Honor Society (UPE)

[*CV compiled on 2025-05-28*]