

William DeGroat

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RESEARCH INTERESTS

Regulatory Genomics · Network Modeling · Deep Learning · Causal Inference · Neurodevelopment

EDUCATION

Rutgers University–New Brunswick
Bachelor of Science in Biotechnology, Minor in Biochemistry

Expected Jan. 2027

RESEARCH EXPERIENCE

Center for Advanced Biotechnology and Medicine

May 2022–Present

Research Assistant | Advisor: Anat Kreimer, PhD

- Conceived and developed a machine-learning model that increased AUPRC for enhancer–gene regulatory interaction prediction by 11–16% relative to established models
- Designed and evaluated machine-learning, deep-learning, and fine-tuned genomic sequence models for prediction of regulatory activity in data-limited neuronal contexts
- Mapped autism-associated non-coding variation onto neuronal gene regulatory networks to identify candidate disease mechanisms
- Generated analyses, figures, and scientific writing for a successful NIH/NLM R01 application on computational modeling of gene regulation

Eli Lilly and Company

May 2025–Aug. 2025

Genetic Medicine Intern | Advisor: Maya Sen, PhD

- Built a prediction pipeline for sgRNA on-target efficiency and off-target activity that improved Spearman ρ by 0.30 and was adopted as Genetic Medicine’s standard workflow

Rutgers Institute for Health

Aug. 2022–May 2025

Senior Research Assistant | Advisor: Zeeshan Ahmed, PhD

- Led development of open-source software for multi-omics disease prediction, directing software architecture and code review while mentoring developers
- Standardized lab-wide bioinformatics pipelines with Nextflow/Snakemake orchestration, Docker/Singularity containerization, and Git-based version control

American Museum of Natural History

Oct. 2021–May 2022

Visiting Scientist | Advisor: Dean Bobo

- Performed genome assembly, annotation, phylogenetics, and comparative genomics while mentoring junior bioinformaticians in command-line and HPC workflows

SELECTED PUBLICATIONS AND MANUSCRIPTS

Peer-Reviewed Publications

DeGroat W, Kreimer A. Massively parallel reporter assay–informed modeling improves prediction of context-specific enhancer–gene regulatory interactions. *Nucleic Acids Research*. 2026. doi: 10.1093/nar/gkag554

DeGroat W, Inoue F, Ashuach T, *et al.* Comprehensive network modeling approaches unravel dynamic enhancer-promoter interactions across neural differentiation. *Genome Biology*. 2024. doi: 10.1186/s13059-024-03365-w

DeGroat W, Abdelhalim H, Patel K, *et al.* Discovering biomarkers associated and predicting cardiovascular disease with high accuracy using a novel nexus of machine learning techniques for precision medicine. *Scientific Reports*. 2024. doi: 10.1038/s41598-023-50600-8

DeGroat W, Mendhe D, Bhusari A, *et al.* IntelliGenes: a novel machine learning pipeline for biomarker discovery and predictive analysis using multi-genomic profiles. *Bioinformatics*. 2023. doi: 10.1093/bioinformatics/btad755

Manuscripts in Preparation

Liu J, **DeGroat W**, Kusuma A, *et al.* Genetic background shapes multi-omic programs and enhancer–gene regulation during neural differentiation. *Manuscript in preparation*.

DeGroat W, Harnof O, Cattel S, *et al.* Modeling RNA partitioning across translational states with Monopoly reveals multilayer dysregulation in autism. *Manuscript in preparation*.

DeGroat W, Williams SE, Koesterich J, *et al.* Decoding generalizable neuronal cis-regulatory grammar across cell types and stimulation states. *Manuscript in preparation*.

SELECTED PRESENTATIONS

Conference Talks

DeGroat W, Kreimer A. Massively parallel reporter assay-informed modeling improves prediction of context-specific enhancer-gene regulatory interactions. *Biology of Genomes, Cold Spring Harbor Laboratory*. 2026. Presented by Anat Kreimer.

DeGroat W, Inoue F, Ashuach T, *et al.* Comprehensive network modeling approaches unravel dynamic enhancer-promoter interactions across neural differentiation. *RECOMB-CSB*. 2025. Presented by Anat Kreimer.

DeGroat W, Kreimer A. Reconstructing cell type-specific enhancer-promoter interaction regulatory networks with massively parallel reporter assays. *Network Biology, Cold Spring Harbor Laboratory*. 2025.

DeGroat W, Kreimer A. Constructing cell type-specific enhancer-promoter regulatory interaction networks with massively parallel reporter assays. *American Society of Human Genetics Annual Meeting*. 2024.

DeGroat W, Inoue F, Ashuach T, *et al.* Unraveling dynamic enhancer-promoter interactions across neural differentiation using network analysis models. *Network Biology, Cold Spring Harbor Laboratory*. 2023.

Poster Presentations

DeGroat W, Williams SE, Koesterich J, *et al.* Learning transferable cis-regulatory grammar across neuronal cell types from massively parallel reporter assays. *AI in Biology, Cold Spring Harbor Laboratory*. 2026.

DeGroat W, Kreimer A. Mapping cell type-specific enhancer–gene interaction networks using massively parallel reporter assays. *Genome Informatics, Cold Spring Harbor Laboratory*. 2025.

DeGroat W, Kreimer A. Constructing cell type-specific enhancer-promoter regulatory interaction networks with massively parallel reporter assays. *Biology of Genomes, Cold Spring Harbor Laboratory*. 2025.

DeGroat W, Inoue F, Ashuach T, *et al.* Comprehensive network modeling approaches unravel dynamic enhancer-promoter interactions across neural differentiation. *Society for Neuroscience Annual Meeting*. 2024.

Invited Talks and Seminars

DeGroat W. Where, When, and How Enhancers Control Genes. *CABM STARS Seminar, Center for Advanced Biotechnology and Medicine*. 2026.

DeGroat W. Invited talk. *Artificial Intelligence Club, Rutgers University*. 2024.

HONORS AND AWARDS

JXTX + CSHL Biology of Genomes Scholarship	2025
James P. Taylor Foundation for Open Science and Cold Spring Harbor Laboratory	
Summer Undergraduate Research Experience (SURE)	2022–2024
Center for Advanced Biotechnology and Medicine, Rutgers University	
Aresty Summer Science Program	2022
Aresty Research Center, Rutgers University	

TEACHING, MENTORING, AND SERVICE

Teaching Assistant, Practicing Precision Medicine	Fall 2023
Rutgers University	
Research Mentor, RISE Program	2024
Illinois Mathematics and Science Academy	
Mentored a single-cell RNA-seq project that received a Gold Level Certificate at the Illinois Junior Academy of Science State Expo	
Peer Reviewer	2025–2026
<i>Molecular Psychiatry · npj Parkinson’s Disease</i>	

TECHNICAL SKILLS

Programming: Python, R, Bash, C++, Rust, SQL
Machine Learning: PyTorch, TensorFlow
Functional Genomics: MPRA, CRISPRi, ATAC-seq, ChIP-seq, Hi-C, RNA-seq, single-cell RNA-seq
Computing: Linux/Unix, CUDA, SLURM, Git, Nextflow, Snakemake, Docker, Singularity, AWS