Daniel B. Munro

Computational biologist at UC San Diego
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EDUCATION

2019	**Ph.D.** Quantitative and Computational Biology, Princeton University Thesis: Revealing disease-relevant alteration patterns through data aggregation. Advisor: Mona Singh
2013	**B.S.** Biology, University of North Texas

RESEARCH EXPERIENCE

05/2025–Present	**Assistant Project Scientist**, UC San Diego and **Visiting Scientist**, Seattle Children's Research Institute Continuing postdoctoral research with Abraham Palmer and Pejman Mohammadi • Quantitative genetics and regulatory genomics • Integrating genetic variation, multi-modal transcriptomics, and complex traits
05/2023–04/2025	**Bioinformatics Programmer**, UC San Diego and **Visiting Scientist**, Seattle Children's Research Institute Continuing postdoctoral research with Abraham Palmer and Pejman Mohammadi • Quantitative genetics and regulatory genomics • Integrating genetic variation, multi-modal transcriptomics, and complex traits
03/2020–04/2023	**Postdoctoral Fellow**, Scripps Research and **Postdoctoral Scholar**, UC San Diego Advisors: Pejman Mohammadi & Abraham Palmer • Quantitative genetics and regulatory genomics • Integrating genetic variation, multi-modal transcriptomics, and complex traits
03/2019–10/2019	**Postdoctoral Associate**, New York University Advisor: Christine Vogel • Computational research in proteomics and cancer genomics
01/2014–12/2018	**Graduate Research Assistant**, Princeton University Advisor: Mona Singh • Computational research in cancer genomics, protein variant impact, and histological image analysis
01/2011–05/2013	**Undergraduate Research Assistant**, University of North Texas Advisor: Qunfeng Dong • Computational microbiome research and genomics software development

PEER-REVIEWED PUBLICATIONS

Center for AI Safety, Scale AI, HLE Contributors Consortium (**D Munro** is a member). A benchmark of expert-level academic questions to assess AI capabilities. *Nature* (2026). 649: 1139-1146.

N Santhanam, S Sanchez-Roige, S Mi, Y Liang, AS Chitre, **D Munro**, D Chen, et al. RatXcan: A framework for cross-species integration of genome-wide association and gene expression data. *PLOS Genetics* (2025). 21(3): e1011583.

EK Hebda-Bauer, MH Hagenauer, **DB Munro**, P Blandino Jr., F Meng, K Arakawa, JDH Stead, et al. Bioenergetic-related gene expression in the hippocampus predicts internalizing vs. externalizing behavior in an animal model of temperament. *Frontiers in Molecular Neuroscience* (2025). 18:1469467.

D Munro, N Ehsan, SM Esmaeili-Fard, A Gusev, AA Palmer, P Mohammadi. Multimodal analysis of RNA sequencing data powers discovery of complex trait genetics. *Nature Communications* (2024). 15: 10387.

F Okamoto, AS Chitre, TM Sanches, D Chen, **D Munro**, AT Aron, A Beeson, et al. Y and mitochondrial chromosomes in the heterogeneous stock rat population. *G3 Genes|Genomes|Genetics* (2024). jkae213.

TV de Jong, Y Pan, P Rastas, **D Munro**, M Tutaj, H Akil, C Benner, et al. A revamped rat reference genome improves the discovery of genetic diversity in laboratory rats. *Cell Genomics* (2024). 4 (4): 100527.

R Clifford, **D Munro**, D Dochtermann, P Devineni, S Pyarajan, Million Veteran Program, F Telese, et al. Genome-wide association study of chronic dizziness in the elderly identifies loci implicating *MLLT10*, *BPTF*, *LINC01224*, and *ROS1*. *JARO* (2023). 24: 575-591.

JL Zhou, G de Guglielmo, AJ Ho, M Kallupi, N Pokhrel, H-R Li, AS Chitre, **D Munro**, et al. Single-nucleus genomics in outbred rats with divergent cocaine addiction-like behaviors reveals changes in amygdala GABAergic inhibition. *Nature Neuroscience* (2023). 26: 1868–1879.

AS Chitre, O Polesskaya, **D Munro**, R Cheng, P Mohammadi, K Holl, J Gao, et al. Exponential increase in QTL detection with increased sample size. *GENETICS* (2023). 224 (2): iyad054.

S Fowler, T Wang, **D Munro**, A Kumar, AS Chitre, TJ Hollingsworth, A Garcia Martinez, et al. Genome-wide association study finds multiple loci associated with intraocular pressure in HS rats. *Frontiers in Genetics* (2023). 13: 1029058.

D Munro, T Wang, AS Chitre, O Polesskaya, N Ehsan, J Gao, A Gusev, LC Solberg Woods, LM Saba, H Chen, AA Palmer, P Mohammadi. The regulatory landscape of multiple brain regions in outbred heterogeneous stock rats. *Nucleic Acids Research* (2022). 50 (19): 10882–10895.

JT Ash*, G Darnell*, **D Munro***, BE Engelhardt. Joint analysis of gene expression levels and histological images identifies genes associated with tissue morphology. *Nature Communications* (2021)*.* 12 (1): 1–12.
* These authors contributed equally

D Munro, M Singh. DeMaSk: A deep mutational scanning substitution matrix and its use for variant impact prediction. *Bioinformatics* (2020). 36 (22–23): 5322–5329.

GXL Li, **D Munro**, D Fermin, C Vogel, H Choi. A protein-centric approach for exome variant aggregation enables sensitive association analysis with clinical outcomes. *Human Mutation* (2020). 41 (5): 934–945.

D Munro, D Ghersi, M Singh. Two critical positions in zinc finger domains are heavily mutated in three human cancer types. *PLoS Comput Biol* (2018). 14 (6): e1006290.

C Cohen, E Toh, **D Munro**, Q Dong, H Hawlena. Similarities and seasonal variations in bacterial communities from the blood of rodents and from their flea vectors. *The ISME Journal* (2015). 2015-01-09.

Y Gavish, H Kedem, I Messika, C Cohen, E Toh, **D Munro**, Q Dong, C Fuqua, K Clay, H Hawlena. Association of host and microbial species diversity across spatial scales in desert rodent communities. *PLoS ONE* (2014). 9: e109677.

JS Kuehn, PJ Gorden, **D Munro**, R Rong, Q Dong, PJ Plummer, C Wang, GJ Phillips. Bacterial community profiling of milk samples as a means to understand culture-negative bovine clinical mastitis. *PLoS ONE*. 8: e61959.

M Zhou, R Rong, **D Munro**, C Zhu, X Gao, Q Zhang, Q Dong (2013). Investigation of the effect of type 2 diabetes mellitus on subgingival plaque microbiota by high-throughput 16S rDNA pyrosequencing. *PLoS ONE* (2013). 8: e61516.

H Hawlena, E Rynkiewicz, E Toh, A Alfred, LA Durden, MW Hastriter, DE Nelson, R Rong, **D Munro**, Q Dong, C Fuqua, K Clay. The arthropod, but not the vertebrate host or its environment, dictates bacterial community composition of fleas and ticks. *The ISME Journal* (2013). 7: 221-223.

K Revanna, **D Munro**, A Gao, C Chiu, A Pathak, Q Dong. A web-based multi-Genome Synteny Viewer for customized data. *BMC Bioinformatics* (2012). 13: 190.

PREPRINTS

P Campo, R Qiao, MR Doyle, **D Munro**, BJ Johnson, AA Palmer, M Kallupi, G de Guglielmo. Ivermectin Reduces Withdrawal-Induced Alcohol Intake via CeA GABAergic Enhancement. Preprint: https://www.biorxiv.org/content/10.1101/2025.10.14.682432v1

KR Ganapathy, E Song, **D Munro**, A Torkamani, P Mohammadi. Allele Specific Expression Quality Control Fills Critical Gap in Transcriptome Assisted Rare Variant Interpretation.

Preprint: https://www.biorxiv.org/content/10.1101/2025.05.30.657086v2

HONORS & AWARDS

2025	Staff Appreciation and Recognition (STAR) Award for 2024-2025, Department of Psychiatry, UC San Diego
2019	Runner-up, Symbiosis Competition at Imagine Science Film Festival, New York, NY, in collaboration with Jin Angdoo
2013	**National Science Foundation Graduate Research Fellowship**
2013	Phi Kappa Phi National Fellowship ($5000)

TEACHING EXPERIENCE

Spring 2016	Assistant in Instruction, "An Integrated, Quantitative Introduction to the Natural Sciences II", Princeton University
Fall 2015	Assistant in Instruction, "An Integrated, Quantitative Introduction to the Natural Sciences I", Princeton University

PRESENTATIONS

2024	"Multimodal analysis of RNA sequencing data powers discovery of complex trait genetics", platform talk at RECOMB-Genetics, April 28, 2024
2022	"The regulatory landscape of multiple brain regions in outbred heterogeneous stock rats", talk at the Complex Trait Consortium-Rat Genomics 2022 meeting, September 29, 2022
2021	"Identification of regulatory landscape in multiple brain regions of outbred heterogeneous stock rats", talk at the Complex Trait Consortium-Rat Genomics 2021 meeting, September 1, 2021
2021, 2023	"Techniques for algorithmic graphics", guest lecture for Honors Colloquium on Complex Systems, University of Nebraska Omaha, March 2, 2021 and March 28, 2023
2020	"Mapping eQTLs in five rat brain regions", talk at the 6th Annual Retreat for P50 Center for GWAS in Outbred Rats, La Jolla, CA, November 2, 2020

PROFESSIONAL SERVICE & MEMBERSHIPS

Test subject in NASA's Exploration Atmosphere study (EA6 Mission 2) at Johnson Space Center, Houston, TX, July 25 to August 1, 2025

Active member of the Multi-Omics and Human analysis working groups for the NASA Open Science Data Repository. https://awg.osdr.space/u/danielmunro

Judge for NASA's GL4HS (GeneLab for High Schools) Capstone Showcase, September 6, 2025

Ad hoc peer reviewer for:
Developmental Biology (2019)
PLOS Computational Biology (2020)
PLOS ONE (2020)
BMC Bioinformatics (2021)
Journal of Computational Biology (2021)
Genome Biology (2023)
IEEE/ACM Transactions on Computational Biology and Bioinformatics (2023)
The American Journal of Human Genetics (2023)
Neuropsychopharmacology (2024)
Nature Communications (2024)

Memberships:
Society for Neuroscience (Since 2025)
American Society of Human Genetics (Since 2020)
International Society for Computational Biology (Since 2019)

CERTIFICATIONS

Initial Physiological Training Course – NASA (Houston, TX, 2024-11-07)
Open Water Diver – PADI (2024-07-28)
Amateur Radio License, General Class – FCC (2024-06-25)