Paul W. Hook

phook2@jhmi.edu | +1 (865) 719-5230 | pwh124.github.io
300 E. 26th Street, Baltimore, MD 21218, USA

EDUCATION

Johns Hopkins School of Medicine, Baltimore, MD — 2014 – 2020
Ph.D., Human Genetics

The Pennsylvania State University, University Park, PA — May 2012
B.S., Biochemistry and Molecular Biology
Area of concentration: Molecular and Cell Biology

RESEARCH EXPERIENCE

Postdoctoral Fellow — 2020 – Present
Whiting School of Engineering
Johns Hopkins University, Baltimore, MD
PI: Winston Timp

- Developing genomics approaches utilizing long-read sequencing to explore subjects including DNA methylation, protein-DNA binding, and information storage in RNA

Graduate Student — 2014 – 2020
Johns Hopkins School of Medicine, Baltimore, MD
Advisor: Andrew McCallion

- Designed, performed, and analyzed RNA-seq and single-cell RNA-seq experiments on mouse dopaminergic neurons and established a scoring paradigm for prioritizing genes from Parkinson disease GWAS loci
- Analyzed chromatin data in order to identify cell populations relevant to schizophrenia disease risk and to prioritize disease-relevant variation in disease-associated loci

Research Technologist — 2012 – 2014
Johns Hopkins School of Medicine, Baltimore, MD
Advisor: Andrew McCallion

- Elucidated the functional consequences of disrupting genes on somitogenesis and heart development in zebrafish and implemented the use of Cas9 nuclease genome editing in zebrafish and human cell culture

Science Undergraduate Laboratory Internship — Summer 2011
Department of Energy, Pacific Northwest National Laboratory, Sequim, WA
Advisor: Michael Huesemann

- Explored how temperature affects algal growth and algal lipid composition for the National Alliance for Advanced Biofuels and Bio-products team

Chemical Research Intern — 2010 – 2011
The Pennsylvania State University, University Park, PA
Advisor: Joseph Keiser

- Adapted and developed experiments focused on exploring the biochemical components of peanuts for an undergraduate laboratory class
- Assisted in designing and building demonstrations for undergraduate chemistry lectures

Paul W. Hook

phook2@jhmi.edu | +1 (865) 719-5230 | pwh124.github.io
300 E. 26th Street, Baltimore, MD 21218, USA

TEACHING EXPERIENCE

Teaching Assistant Fall 2016
Evolution of Ideas in Human Genetics
Johns Hopkins University School of Medicine, Baltimore, MD

Presenter November 14, 2015
The Genome Geeks Are In
Smithsonian National Museum of Natural History, Washington, DC

Peer Learning Assistant Fall 2011
BMB 430: Developmental Biology
The Pennsylvania State University, University Park, PA

LEADERSHIP AND MENTORING

Shared Interest Group (SIG) Leader 2022 – Present
Bioinformatics and Computational Methods SIG
The American Society of Human Genetics

Membership Engagement Committee 2020 – Present
The American Society of Human Genetics

ASHG Annual Meeting Advisory Group 2022
The American Society of Human Genetics

Program Committee 2022
NIH Advanced Genomic Technology Development Annual Meeting

Student Faculty Representative 2016 – 2020
Human Genetics Pre-Doctoral Training Program
Johns Hopkins University School of Medicine, Baltimore, MD

Peer Mentoring Leader 2017 – 2020
Institute of Genetic Medicine Peer Mentoring Families
Johns Hopkins University School of Medicine, Baltimore, MD

PROFESSIONAL ASSOCIATIONS

The American Society of Human Genetics 2015 - Present

PREPRINTS AND PEER-REVIEWED PUBLICATIONS

Rhie, A., Nurk, S., Cechova, M., Hoyt, S.J., Taylor, D.J., Altemose, N., **Hook, P.W.**, Koren, S., Rautiainen, M., Alexandrov, I.A., …, Eichler, E.E, O'Neill, R., Schatz, M.C., Miga, K.H., Makova, K.D., & Phillippy, A.M. (2023). The complete sequence of a human Y chromosome. *Nature*, 1–11. https://doi.org/10.1038/s41586-023-06457-y.

Paul W. Hook

phook2@jhmi.edu | +1 (865) 719-5230 | pwh124.github.io
300 E. 26th Street, Baltimore, MD 21218, USA

Hook, P.W., and Timp, W. (2023). Beyond assembly: the increasing flexibility of single-molecule sequencing technology. *Nat. Rev. Genet. 24*, 627–641.

Boyd, R.J., McClymont, S.A., Barrientos, N.B., **Hook, P.W.**, Law, W.D., Rose, R.J., Waite, E.L., Rathinavelu, J., Avramopoulos, D., and McCallion, A.S. (2023). Evaluating the mouse neural precursor line, SN4741, as a suitable proxy for midbrain dopaminergic neurons. *BMC Genomics 24*, 306.

Razaghi, R., **Hook, P.W**., Ou, S., Schatz, M. C., Hansen, K. D., Jain, M., & Timp, W. (2022). Modbamtools: Analysis of single-molecule epigenetic data for long-range profiling, heterogeneity, and clustering. *bioRxiv*, 2022.07.07.499188.

Gershman, A., Sauria, M.E.G., Guitart, X., Vollger, M.R., **Hook, P.W.**, Hoyt, S.J., Jain, M., Shumate, A., Razaghi, R., Koren, S., Altemose, N., Caldas, G.V., Logsdon, G.A., Rhie, A., Eichler, E.E., Schatz, M.C., O'Neill, R.J., Phillippy, A.M., Miga, K.H., & Timp, W. (2022). Epigenetic patterns in a complete human genome. *Science*, *376* (6588), eabj5089.

Soto-Beasley, A.I., Walton, R.L., Valentino, R.R., **Hook, P.W.**, Labbé, C., Heckman, M.G., Johnson, P.W., Goff, L.A., Uitti, R.J., McLean, P.J., Springer, W., McCallion, A.S., Wszolek, Z.K., & Ross, O.A. (2020). Screening non-*MAPT* genes of the Chr17q21 H1 haplotype in Parkinson's disease. *Parkinsonism & Related Disorders*, *78*, 138–144.

Hook, P.W., & McCallion, A.S. (2020). Leveraging mouse chromatin data for heritability enrichment informs common disease architecture and reveals cortical layer contributions to schizophrenia. *Genome Research*, *30* (4): 528–39.

McClymont, S.A, **Hook, P.W.**, Soto, A.I., Reed, X., Law, W.D., Kerans, S.J., Waite, E.L., Briceno, N.J., Thole, J.F., Heckman, M.G., Diehl, N.N., Wszolek, Z.K., Moore, C.D., Zhu, H., Akiyama, J.A., Dickel, D.E., Visel, A., Pennacchio, L.A., Ross, O.A., Beer, M.A., McCallion, A.S. (2018). Parkinson Associated *SNCA* Enhancer Variants Revealed by Open Chromatin in Mouse Dopamine Neurons. *The American Journal of Human Genetics*, *103* (6), 874–892.

Hook, P.W., McClymont, S.A., Cannon, G.H., Law, W.D., Morton, A.J., Goff, L.A., & McCallion, A.S. (2018). Single-Cell RNA-Seq of Mouse Dopaminergic Neurons Informs Candidate Gene Selection for Sporadic Parkinson Disease. *The American Journal of Human Genetics*, *102* (3), 427–446.

Turner, T.N., Hormozdiari, F., Duyzend, M.H., McClymont, S.A., **Hook, P.W.**, Iossifov, I., … Eichler, E.E. (2016). Genome Sequencing of Autism-Affected Families Reveals Disruption of Putative Noncoding Regulatory DNA. *The American Journal of Human Genetics*, *98* (1), 58–74.

Maragh, S., Miller, R.A., Bessling, S.L., Wang, G., **Hook, P.W.**, & McCallion, A.S. (2014). Rbm24a and Rbm24b are required for normal somitogenesis. *PLoS ONE*, *9* (8).

Van Wagenen, J., Miller, T.W., Hobbs, S., **Hook, P.**, Crowe, B., and Huesemann, M. (2012). Effects of light and temperature on fatty acid production in *Nannochloropsis salina*. *Energies 5*, 731–740.

Paul W. Hook

phook2@jhmi.edu | +1 (865) 719-5230 | pwh124.github.io
300 E. 26th Street, Baltimore, MD 21218, USA

PLATFORM AND INVITED TALKS

Hook, P.W. "Targeted long-read sequencing for interrogation of cancer genetic loci." Association of Biomolecular Resources Facilities Annual Meeting, Palm Springs, CA, 2022.

Hook, P.W., McCallion, A.S. "Refining cell populations and fine-mapping variants for schizophrenia and bipolar disorder using mouse open chromatin profiles" The American Society of Human Genetics, Houston, TX, 2019.

Hook, P.W., McClymont S.A., Cannon, G.H., Law, W.D., Morton, A.J., Goff, L.A., McCallion, A.S. "Prioritizing genes for sporadic Parkinson disease using single-cell expression profiling of mouse dopaminergic neurons" 11th Leena Peltonen School of Human Genomics, Les Diablerets, Switzerland, 2018.

Hook, P.W., McClymont, S.A., Goff, L.A., McCallion, A.S. "RNA-seq analysis identifies phenotypic heterogeneity among *ex vivo* purified dopamine neurons and highlights their progressive temporal diversification" The American Society of Human Genetics, Vancouver, BC, Canada, 2016.

POSTER PRESENTATIONS

Hook, P.W., Hosea, J.A., Morina, L.B., Ebenstein, Y., Simpson, J., Timp, W. "Measuring the epigenome with nanopore sequencing." The Advances in Genomic Technology Development Annual Meeting, La Jolla, California, 2023.

Hook, P.W., Timp, W. "Protein-DNA interactions at the bench: CUT&RUN/Tag with nanopore sequencing." The Advances in Genome Biology and Technology Annual Meeting, Hollywood, FL, 2023.

Hook, P.W., Krueger, F., Timp, W. "Adapting Enzymatic Methyl-seq (EM-seq) for long-read nanopore sequencing." Nanopore Community Meeting, New York City, NY, 2022.

Hook, P.W., Krueger, F., Timp, W. "Adapting Enzymatic Methyl-seq (EM-seq) for long read sequencing." The Advances in Genome Biology and Technology Annual Meeting, Orlando, FL, 2022.

HONORS AND AWARDS

ASHG/Charles J. Epstein Trainee Award for Excellence in Human Genetics Research – Semifinalist 2019
The American Society of Human Genetics - Houston, TX
"Refining cell populations and fine-mapping variants for schizophrenia and bipolar disorder using mouse open chromatin profiles"

C.W. Cotterman Award 2018
The American Society of Human Genetics – San Diego, CA
"*Single-Cell RNA-Seq of Mouse Dopaminergic Neurons Informs Candidate Gene Selection for Sporadic Parkinson Disease*"

Paul W. Hook

phook2@jhmi.edu | +1 (865) 719-5230 | pwh124.github.io
300 E. 26th Street, Baltimore, MD 21218, USA

Leena Peltonen School of Human Genomics Trainee Summer 2018
Les Diablerets, Switzerland

Graduated with Distinction May 2012
Eberly College of Science
The Pennsylvania State University, University Park, PA

Dean's List 2008-2012
Eberly College of Science
The Pennsylvania State University, University Park, PA

Gail A. and Thomas G. Ernst Scholarship 2009 – 2011

Kimberly Clark Bright Futures Scholarship 2008 – 2012