

# Drew Hughes

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## Academic Positions & Employment

2023–Present **Assistant Professor, Section of Molecular Oncology, Division of Anatomic and Molecular Pathology, Department of Pathology & Immunology, Washington University School of Medicine, St. Louis, MO.**

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## Board Certification

2023 **Molecular Genetic Pathology, American Board of Pathology.**  
2022 **Clinical Pathology, American Board of Pathology.**

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## Post-Graduate Training

2022–2023 **Clinical Fellow, Molecular Genetic Pathology, Washington University School of Medicine, St. Louis, MO.**  
2019–2022 **Resident, Clinical Pathology, Barnes-Jewish Hospital, St. Louis, MO.**

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## Education

2009–2019 **MD/PhD, Molecular Genetics and Genomics, Washington University School of Medicine St. Louis, MO.**  
2004–2008 **BS (*summa cum laude*), Mathematics, College of William & Mary, Williamsburg, VA.**

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## Teaching Experience

2015, 2016 **Washington University School of Medicine, Teaching Assistant: Fundamentals of Biostatistics, St. Louis, MO.**  
2011 **Washington University School of Medicine, Teaching Assistant: Human Anatomy and Development, St. Louis, MO.**

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## Skills

**Clinical Pathology:** molecular diagnostics | clinical variant interpretation | assay development | assay validation | clinical informatics | Epic | Cerner.

**Genomics:** next-generation sequencing | nanopore sequencing | end-to-end bioinformatic analysis | germline and somatic variant calling | RNA-seq | ATAC-seq | ChIP-seq | massively parallel reporter assays.

**Data Science:** machine learning | statistical modeling | data visualization | R {tidyverse} {tidymodels} {shiny} {Bioconductor} | Bash | Python | SQL | Git | high-performance computing.

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## Honors and Awards

2023 **Clinical Pathology Fellow Educator of the Year, Department of Pathology & Immunology, Washington University School of Medicine.**  
2021 **Richard Marshall Education Award, American Association for Clinical Chemistry.**  
2021 **Best Abstract (Clinical and Diagnostic Immunology), American Association for Clinical Chemistry.**

- 2021 Most Innovative Abstract, American Society for Histocompatibility and Immunogenetics.
- 2020 Abstract Achievement Award, American Society of Hematology.
- 2020 Paul E. Strandjord Young Investigator Award, Academy of Clinical Laboratory Physicians and Scientists.
- 2020 Best Laboratory and Genomic Medicine Grand Rounds Presentation, Department of Pathology & Immunology, Washington University School of Medicine.
- 2019 Dr. Philip Rosenblatt Award, Department of Pathology & Immunology, Washington University School of Medicine.
- 2008 Phi Beta Kappa, College of William & Mary.
- 2008 Cissy Patterson Prize, Department of Mathematics, College of William & Mary.
- 2008 Honors, Department of Biology, College of William & Mary.

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## Peer-Reviewed Publications

- 2023 **Hughes AEO**, Forbriger A, May AM, Scott MG, Char D, Farnsworth CW. Implementation of high-sensitivity troponin with a rapid diagnostic algorithm reduces emergency department length of stay for discharged patients. *Clin Biochem.* 2023 Jun;116:87–93. PMID: 37054770. doi: 10.1016/j.clinbiochem.2023.04.003.
- 2022 **Hughes AEO** and Jackups R Jr. Clinical Decision Support for Laboratory Testing. *Clinical Chemistry*, 68(3), 402–412. PMID: 34871351. doi: 10.1093/clinchem/hvab201.
- 2021 Duncavage EJ, Schroeder MC, O’Laughlin M, Wilson R, MacMillan S, Bohannon A, Kruchowski S, Garza J, Du F, **Hughes AEO**, Robinson J, Hughes E, Heath SE, Baty JD, Neidich J, Christopher MJ, Jacoby MA, Uy GL, Fulton RS, Miller CA, Payton JE, Link DC, Walter MJ, Westervelt P, DiPersio JF, Ley TJ, and Spencer DH. Genome Sequencing as an Alternative to Cytogenetic Analysis in Myeloid Cancers. *The New England Journal of Medicine*, 384(10), 924–935. PMID: 33704937. doi: 10.1056/NEJMoa2024534.
- 2020 Perez-Cervantes C, Smith LA, Nadadur RD, **Hughes AEO**, Wang S, Corbo JC, Cepko C, Lonfat N, and Moskowitz IP. Enhancer Transcription Identifies *cis*-Regulatory Elements for Photoreceptor Cell Types. *Development*, 147(3), dev184432. PMID: 31915147. doi: 10.1242/dev.184432.
- 2020 **Hughes AEO**, Webber DM, Wallace MA, Johnson C, Burnham CA, and Anderson NW. Comparable Detections of Viral Pathogens in Lower Respiratory Tract Specimens with the BioFire Respiratory Panel 2 and the BioFire Pneumonia Panel. *Journal of Clinical Microbiology*, 58(6), e00254-20. PMID: 32269103. doi: 10.1128/JCM.00254-20.
- 2020 Volkov LI, Kim-Han JS, Saunders LM, Poria D, **Hughes AEO**, Kefalov VJ, Parichy DM, and Corbo JC. Thyroid Hormone Receptors Mediate Two Distinct Mechanisms of Long-Wavelength Vision. *Proceedings of the National Academy of Sciences of the United States of America*, 117(26), 15262–15269. PMID: 32541022. doi: 10.1073/pnas.1920086117.
- 2019 Murphy DP, **Hughes AEO**, Lawrence KA, Myers CA, and Corbo JC. *Cis*-Regulatory Basis of Sister Cell Type Divergence in the Vertebrate Retina. *Elife*, 8, e48216. PMID: 31633482. doi: 10.7554/eLife.48216.
- 2018 **Hughes AEO**, Myers CA, and Corbo JC. A Massively Parallel Reporter Assay Reveals Context-Dependent Activity of Homeodomain Binding Sites In Vivo. *Genome Research*, 28(10), 1520–1531. PMID: 30158147. doi: 10.1101/gr.231886.117.
- 2017 **Hughes AEO**, Enright JM, Myers CA, Shen SQ, and Corbo JC. Cell Type-Specific Epigenomic Analysis Reveals a Uniquely Closed Chromatin Architecture in Mouse Rod Photoreceptors. *Scientific Reports*, 7, 43184. PMID: 28256534. doi: 10.1038/srep43184.
- 2016 Shen SQ, Myers CA, **Hughes AEO**, Byrne LC, Flannery JG, and Corbo JC. Massively Parallel *cis*-Regulatory Analysis in the Mammalian Central Nervous System. *Genome Research*, 26(2), 238–55. PMID: 26576614. doi: 10.1101/gr.193789.115.

- 2015 Young AL, Wong TN, **Hughes AEO**, Heath SE, Ley TJ, Link DC, and Druley TE. Quantifying Ultra-Rare Pre-Leukemic Clones Via Targeted Error-Corrected Sequencing. *Leukemia*, 29(7), 1608–11. PMID: 25644247. doi: 10.1038/leu.2015.17.
- 2014 **Hughes AEO**, Magrini V, Demeter R, Miller CA, Fulton R, Fulton LL, Eades WC, Elliott K, Heath S, Westervelt P, Ding L, Conrad DF, White BS, Shao J, Link DC, DiPersio JF, Mardis ER, Wilson RK, Ley TJ, Walter MJ, and Graubert TA. Clonal Architecture of Secondary Acute Myeloid Leukemia Defined by Single-Cell Sequencing. *PLOS Genetics*, 10(7), e1004462. PMID: 25010716. doi: 10.1371/journal.pgen.1004462.
- 2012 Ramos E, Levinson BT, Chasnoff S, **Hughes AEO**, Young AL, Thornton K, Li A, Vallania FL, Province M, and Druley TE. Population-Based Rare Variant Detection Via Pooled Exome or Custom Hybridization Capture with or without Individual Indexing. *BMC Genomics* 13, 683. PMID: 23216810. doi: 10.1186/1471-2164-13-683.

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## Book Chapters

- 2022 Parikh BA, **Hughes AEO**, and Anderson NW. Molecular Microbiology. In *Manual of Clinical Microbiology*, 13th ed. *In Press*.

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## Presentations

- 2022 **Hughes AEO**, Anderson NW, Eberly AR, and Parikh BA. Evaluating the Utility of Ct Skewness to Predict SARS-CoV-2 Epidemiological Dynamics. Poster presentation, *American Society for Microbiology Clinical Virology Symposium*, May 1–4, West Palm Beach, FL.
- 2021 **Hughes AEO**, Bell RC, Abel HJ, Schroeder MC, Liu C, Duncavage EJ, and Spencer DH. Human Leukocyte Antigen Typing of Patients with Myeloid Malignancies by Whole Genome Sequencing. Oral presentation, *Association for Molecular Pathology Annual Meeting and Expo*, November 16–20, Philadelphia, PA.
- 2021 **Hughes AEO**, Farnsworth CW, and Gronowski AM. Automated Interpretation of Serum Protein Electrophoresis. Poster presentation, *American Association for Clinical Chemistry*, September 26–30, Atlanta, GA.
- 2021 **Hughes AEO**, Montgomery MC, Liu C, and Weimer ET. Allele-Specific Quantification of HLA Transcript Isoforms by Nanopore Long-Read Sequencing. Poster presentation, *American Society for Histocompatibility and Immunogenetics*, September 27–October 1, Orlando, FL.
- 2021 **Hughes AEO**, Farnsworth CW, and Gronowski AM. Automated Interpretation of Serum Protein Electrophoresis. Poster presentation (virtual), *Association for Pathology Informatics Summit*, May 18–21, Pittsburgh, PA.
- 2020 **Hughes AEO**, Montgomery MC, Liu C, and Weimer ET. Allele-Specific HLA Expression with Nanopore Long-Read Sequencing. Poster presentation (virtual), *American Society of Hematology Annual Meeting*, December 5–8, San Diego, CA.
- 2020 **Hughes AEO**, Webber DM, Wallace MA, Johnson C, Burnham CAD, and Anderson NW. Combining the BioFire Pneumonia Panel with Culture Optimizes Lower Respiratory Pathogen Testing. Poster presentation (virtual), *American Society for Microbiology Microbe*, July 17–18, Chicago, IL.
- 2016 **Hughes AEO**, Enright JM, Myers CA, and Corbo JC. Nrl Mediates Widespread Changes in the Epigenomic Landscape of Mouse Photoreceptors. Poster presentation, *The Biology of Genomes*, May 10–14, Cold Spring Harbor, NY.

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## Peer Review Activities

Referee: *Clinical Biochemistry, Clinical Chemistry, Frontiers, The Journal of Applied Laboratory Medicine, Journal of Clinical Microbiology, and The Journal of Molecular Diagnostics.*