Jonathon T Hill, PhD

Associate Professor, Brigham Young University
LSB 3018 (Office), LSB 3035 (Lab)
jhill@byu.edu

Positions

Scientific Advisor 2023-Current	**Renew Biolabs, LLC** I advise on scientific and IP issues for Renew and its subsidiaries, including Resonant, LLC, Wasatch Biolabs, LLC, Nanohyb, LLC, and others.
Co-Founder 2023-Current	**Nanohyb, LLC** Founded Company that uses Nanopore Sequencing for clinical diagnostics.
Co-Founder 2022-Current	**Wasatch Biolabs, LLC** Wasatch Biolabs uses Nanopore Sequencing for clinical diagnostics.
Assoc. Prof. 2021-Current	**Brigham Young University** Dept. of Cell Biology and Physiology
Scientific Advisor 2020-Current	**Diagnostic Ventures** Worked on developing a rapid antigen test and a rapid sepsis test.
Co-Founder 2018-Current	**Pioneer Biolabs, LLC** Pioneer Biolabs was originally created to make enzymatic CRISPR library kits. It has since pivoted to conduct screens to improve protein production.
Asst. Prof. 2015-2021	**Brigham Young University** Dept. of Cell Biology and Physiology
Postdoc 2010-2015	**University of Utah**, H. Joseph Yost, PhD Studied Genetic and epigenetic regulation of heart development

Education

Ph.D. 2007-2010	**Columbia University**, Lori Sussel, PhD “Nkx2-2 regulation during pancreas development” *Awarded with Distinction*
M.S. 2005-2007	**University of Colorado Health Sciences Center**, Lori Sussel, PhD “Developmental ontogeny of pancreatic ε-cells”
B.S. 1999-2005	**Brigham Young University**, Richard Robison, PhD Microbiology Major, “Culture techniques of *Mycobacterium ulcerans*”

Publications

1. Tasnim, M., Robinson, K. A., Ward, C. B., Melling, L. P., Jenkins, H. N., Wahlquist, P., Elison, J., Price, J.C., & **Hill, J. T.** (2025). Functional divergence of Tbx2a and Tbx2b in zebrafish heart development. *EvoDevo*.
2. Domyan, E. T., Baker, S., Brownlee, W., Burton, B., Kiggins, K., Naylor, E., Piper, H., Porter, T., Strobelt, B., Dian-Rong, T., Walker, N., Walton, Z., & **Hill, J. T.** (2025). An Integrated Investigation of SOX10 in Feather Color in Domestic Rock Pigeon (Columba livia). *Pigment Cell & Melanoma Research*, *38*(6), e70061.
3. Farooq, I., Ahmad, N., Porter, C., Smith, R., Scharf, T., Cowley, A., Jenkins, A., Yates, J. D., **Hill, J. T.**, & Nielsen, B. L. (2025). Characterization of halotolerant *Kushneria* isolates that stimulate growth of alfalfa in saline conditions. *PLoS ONE, 20*(4), e0322979.
4. Wilcox, S. H., Calixto, J., Dray, S. D., Rasch, D. M., Smith, A. H., Brodowski, K. D., **Hill, J. T.**, & Thomson, D. M. (2025). Chronic treatment of old mice with AICAR reverses age-related changes in exercise performance and skeletal muscle gene expression. *FASEB BioAdvances*, *e1491*.

5. Pollard, C. A., Saito, E. R., Burns, J. M., **Hill, J. T.**, & Jenkins, T. G. (2024). Considering biomarkers of neurodegeneration in Alzheimer's disease: The potential of circulating cell-free DNA in precision neurology. *Journal of Personalized Medicine, 14*(11), 1104.
6. Herring, J. A., Crabtree, J. E., **Hill, J. T.**, & Tessem, J. S. (2024). Loss of glucose-stimulated β-cell Nr4a1 expression impairs insulin secretion and glucose homeostasis. *American Journal of Physiology-Cell Physiology, 327*(4), C1111–C1124.
7. Tasnim, M., Wahlquist, P., & **Hill, J. T.** (2024). Zebrafish: Unraveling genetic complexity through duplicated genes. *Development Genes and Evolution*, 1–18.
8. Piorczynski, T. B., Calixto, J., Henry, H. C., England, K., Cowley, S., Hansen, J. M., **Hill, J. T.**, & Hansen, J. M. (2024). Valproic acid causes redox-regulated post-translational protein modifications that are dependent upon P19 cellular differentiation states. *Antioxidants, 13*, 560.
9. Vaughan, A. J., McMeekin, L. J., Hine, K., Stubbs, I. W., Codadu, N. K., Cockell, S., **Hill, J. T.**, Cowell, R., Trevelyan, A. J., & Parrish, R. R. (2024). RNA sequencing demonstrates ex vivo neocortical transcriptomic changes induced by epileptiform activity in male and female mice. *eNeuro*. Advance online publication.
10. Searle, P. C., Shiozawa, D. K., Evans, R. P., **Hill, J. T.**, Suli, A., Stark, M. R., & Belk, M. C. (2024). Heterochronic shift in gene expression leads to ontogenetic morphological divergence between two closely related polyploid species. *iScience, 27*(4).
11. Pollard, C., Aston, K., Emery, B. R., **Hill, J. T.**, & Jenkins, T. (2023). Detection of neuron-derived cfDNA in blood plasma: A new diagnostic approach for neurodegenerative conditions. *Frontiers in Neurology, 14*.
12. Tasnim, M., Selph, T. J., Olcott, J., & **Hill, J. T.** (2023). The type IIS restriction enzyme MmeI can cut across a double-strand break. *Molecular Biology Reports*. Advance online publication.
13. Martin, A., Babbitt, A., Pickens, A. G., Pickett, B. E., **Hill, J. T.**, & Suli, A. (2022). Single-cell RNA sequencing characterizes the molecular heterogeneity of the larval zebrafish optic tectum. *Frontiers in Molecular Neuroscience, 15*, 818007.
14. Garg, D., Hodgman, M., Reil, S., Lomo, L., Aston, K. I., **Hill, J. T.**, Johnstone, E., Jenkins, T., & Letourneau, J. M. (2022). Effect of chemotherapy on the uterus of young adult cancer survivors. *F&S Reports*.
15. Casey, M. A., **Hill, J. T.**, Hoshijima, K., Bryan, C. D., Gribble, S. L., Brown, J. T., Chien, C. B., Yost, H. J., & Kwan, K. M. (2022). Shutdown corner, a large deletion mutant isolated from a haploid mutagenesis screen in zebrafish. *G3: Genes, Genomes, Genetics, 12*(3). Advance online publication.
16. Yates, J. D., Russell, R. C., Barton, N. J., Yost, H. J., & **Hill, J. T.** (2021). A simple and rapid method for enzymatic synthesis of CRISPR-Cas9 sgRNA libraries. *Nucleic Acids Research, 49*(22), e131.
17. McGuire, K. L., Smit, P., Ess, D. H., **Hill, J. T.**, Harrison, R. G., & Busath, D. D. (2021). Mechanism and kinetics of copper complexes binding to the influenza A M2 S31N and S31N/G34E channels. *Biophysical Journal, 120*(1), 168–177.
18. McGuire, K. L., **Hill, J. T.**, & Busath, D. D. (2020). Increased dissociation of adamantanamines in influenza A M2 S31N with partial block by rimantadine. *Biophysical Journal, 119*(9), 1811–1820.
19. Chen, T., **Hill, J. T.**, Moore, T. M., Cheung, E., Olsen, Z. E., Piorczynski, T. B., Marriott, T. D., Tessem, J. S., Walton, C. M., Bikman, B. T., Hansen, J. M., & Thomson, D. M. (2020). Lack of skeletal muscle liver kinase B1 alters gene expression, mitochondrial content, inflammation, and oxidative stress without affecting high-fat diet-induced obesity or insulin resistance. *Biochimica et Biophysica Acta: Molecular Basis of Disease, 1866*(8), 165805.
20. Domyan, E. T., Hardy, J., Wright, T., Frazer, C., Daniels, J., Kirkpatrick, J., Wakamatsu, K., & **Hill, J. T.** (2019). SOX10 regulates multiple genes to direct eumelanin versus pheomelanin production in domestic rock pigeon. *Pigment Cell & Melanoma Research, 32*(5), 634–642.
21. Fox, J. C., Evans, A. T., Blomfield, M. P., Livingstone, S. K., Tenney, S. R., Webster, J. B., Perry, K., **Hill, J. T.**, Bikman, B. T., & Hansen, M. (2019). Resistance mechanisms and cross-resistance for a pyridine-pyrimidine amide inhibitor of microtubule polymerization. *Bioorganic & Medicinal Chemistry Letters, 29*(13), 1647–1653.

22. Speirs, M. P., Swensen, A. C., Chan, T. Y., Jones, P. M., Holman, J. C., Harric, M. B., Maschek, J. A., Cox, J. E., Carson, R. H., **Hill, J. T.**, Andersen, J., Prince, J. T., & Price, J. C. (2019). Imbalanced sphingolipid signaling is maintained as a core proponent of a cancerous phenotype in spite of metabolic pressure and epigenetic drift. *Oncotarget*. Advance online publication.
23. Johnsen, S. P., Yates, J. D., Frederich, Z. B., & **Hill, J. T.** (2018). ZeMo: An open-source water quality monitoring system for aquaria. *Zebrafish, 15*(6), 652–655.
24. **Hill, J. T.**, Demarest, B., Gorsi, B., Smith, M., & Yost, H. J. (2017). Heart morphogenesis gene regulatory networks revealed by temporal expression analysis. *Development, 144*(19), 3487–3498.
25. Karanth, S., Zinkhan, E. K., **Hill, J. T.**, Yost, H. J., & Schlegel, A. (2016). FOXN3 regulates hepatic glucose utilization. *Cell Reports, 15*, 2745–2755.
26. Ray, J. D., Kener, K. B., Bitner, B. F., Wright, B. J., Ballard, M. S., Barrett, E. J., **Hill, J. T.**, Moss, L. G., & Tessem, J. S. (2016). Nkx6.1-mediated insulin secretion and β-cell proliferation is dependent on upregulation of c-Fos. *FEBS Letters, 590*, 1791–1803.
27. **Hill, J. T.**, Demarest, B. L., Bisgrove, B. W., Su, Y., Smith, M., & Yost, H. J. (2014). Poly Peak Parser: Method and software for identification of unknown indels using Sanger sequencing of PCR products. *Developmental Dynamics, 243*(12), 1632–1636.
28. Sarkar, A. A., Nuwayhid, S. J., Maynard, T. M., Ghandchi, F., **Hill, J. T.**, Lamantia, A. S., & Zohn, I. E. (2014). Hectd1 is required for development of the junctional zone of the placenta. *Developmental Biology, 392*(2), 368–380.
29. **Hill, J. T.**, Demarest, B. L., Bisgrove, B. W., Gorsi, B., Su, Y., & Yost, H. J. (2013). MMAPPR: Mutation mapping analysis pipeline for pooled RNA-seq. *Genome Research, 23*(4), 687–697.
30. Maguire, C. T., Demarest, B. L., **Hill, J. T.**, Palmer, J. D., Brothman, A. R., Yost, H. J., & Condic, M. L. (2013). Genome-wide analysis reveals the unique stem cell identity of human amniocytes. *PLoS ONE, 7*(12), e520267.
31. Arnes, L., **Hill, J. T.**, Gross, S., Magnuson, M. A., & Sussel, L. (2012). Ghrelin expression in the mouse pancreas defines a unique multipotent progenitor population. *PLoS ONE, 7*(12), e520267.
32. **Hill, J. T.**, Anderson, K. R., Mastracci, T. L., Kaestner, K. H., & Sussel, L. (2011). Novel computational analysis of protein binding microarray data identifies direct targets of Nkx2-2 in the pancreas. *BMC Bioinformatics, 12*, 62.
33. **Hill, J. T.**, Chao, C. S., Anderson, K. R., Kaufman, F., Johnson, C. W., & Sussel, L. (2010). Nkx2-2 activates the ghrelin promoter in pancreatic islet cells. *Molecular Endocrinology, 24*, 381–390.
34. **Hill, J. T.**, Mastracci, T. L., Vinton, C., Doyle, M. L., Anderson, K. R., Loomis, Z. L., Schrunk, J. M., Minic, A. D., Prabakar, K. R., Pugliese, A., Sun, Y., Smith, R. G., & Sussel, L. (2009). Ghrelin is dispensable for embryonic pancreatic islet development and differentiation. *Regulatory Peptides, 157*, 51–56.

Book Chapters

1. **Hill, J. T.** (2019). Identifying toxicant-interacting genes using forward-genetic screening in zebrafish. In J. Hansen & L. Winn (Eds.), *Developmental toxicology: Methods and protocols* (2nd ed.).

Invited Presentations

2025	**Plasma Neuron-Derived cfDNA: Nanopore Sequencing for Neurodegenerative Disease** Oxford Nanopore's London Calling Conference
2024	**Platform Talk: Bringing Nanopore to the Clinic** American Society for Human Genetics
2024	**Using Nanopore Technology to Establish the Fire Sponge as a Spermatogenesis Model** American Society for Andrology National Meeting
2023	**What Evolution Can Teach Us About Human Development** Universidade Federal da Bahia (Brazil) *Given in Portuguese*

2018 **Enzymatic Generation of CRISPR Libraries**
NHLBI B2B Consortium Meeting

2016 **RNA-seq Time Course Data Reveals Gene Regulatory Interactions During Heart Looping**
Ohio State University

2016 **RNA-seq Time Course Data Reveals Gene Regulatory Interactions During Heart Looping**
NHLBI B2B Consortium Meeting

2014 **Genetic and Genomic Analysis of Heart Development in Zebrafish**
Utah Valley University

Submitted Posters and Oral Presentations (not including those by students)

2022 **SLOLAM: A Simple and Rapid Method for Enzymatically Generating CRISPR-Cas9 sgRNA Libraries**
International Zebrafish Conference (online)

2021 **SLOLAM: A Simple and Rapid Method for Enzymatically Generating CRISPR-Cas9 sgRNA Libraries**
Southwest Regional Society for Developmental Biology 2021

2020 **SLOLAM: A Simple and Rapid Method for Enzymatically Generating CRISPR-Cas9 sgRNA Libraries**
Society for Developmental Biology 2020

2019 **A CRISPR/Cas9 Tissue Specific Forward Genetic Screening Method in *Danio rerio***
International Zebrafish Society SCZI Conference

2018 **High-Throughput Promoter Analysis**
NHLBI B2B Consortium Meeting

2015 **RNA-seq Time Course Data Reveals Gene Regulatory Interactions During Heart Looping**
SDB National Meeting (Poster)

2015 **RNA-seq Time Course Data Reveals Gene Regulatory Interactions During Heart Looping**
Weinstein Cardiovascular Conference (Poster)

2015 **RNA-seq Time Course Data Reveals Gene Regulatory Interactions During Heart Looping**
Heart Disease and Regeneration: Insights from Development (Oral)

2014 **RNA-seq Timecourse of Heart Morphogenesis in Zebrafish**
SDB Southwest Regional Meeting (Oral)

2013 **Genomic Techniques for Studying Heart Development in Zebrafish**
Bench to Bassinet Consortium Meeting (Oral)

2013 **MMAPPR: Mutation Mapping Analysis Pipeline for Pooled RNA-seq**
International Congress of Developmental Biology (Poster)

2013 **MMAPPR: Mutation Mapping Analysis Pipeline for Pooled RNA-seq**
SDB Southwest Meeting (Oral) Received best presentation by a Postdoc

2012 **MMAPPR: Mutation Mapping Analysis Pipeline for Pooled RNA-seq**
BioT Conference (Poster)

2012 **MMAPPR: Mutation Mapping Analysis Pipeline for Pooled RNA-seq**
Weinstein Cardiovascular Conference (Poster)

2009 **Transcriptional Regulation in The Embryonic Pancreas by Nkx2.2**
Beta Cell Biology Consortium Investigator Retreat (Poster)

2008 **Nkx2.2 Activates the Ghrelin Promoter in Mature Islet Cells**

Beta Cell Biology Consortium Investigator Retreat (Poster)

2007 **Characterization of The Ghrelin Promoter**
Beta Cell Biology Consortium Investigator Retreat (Poster)

External Funding

2025 **Fulbright Specialist Award: A Course on Genomic Sequencing and Assembly using Oxford Nanopore**
Fulbright Commission
PI: Jonathon Hill, Emilio Lanna, Luzimar Fernandez
Total Direct Cost: $12,000

2024-2027 **Renewal: Developing a CRISPR-based forward-genetic screening method in embryonic zebrafish**
NIH-NICHD: R15 HD098969-02
PI: Jonathon Hill
Total Direct Cost: $300,000

2023-2026 **Sistemática e Biologia de Esponjas da Bahia, Nordeste do Brasil**
Brazilian National Council for Scientific and Technological Development (CNPq)
PI: Emilio Lanna, Jonathon Hill (Co-Investigator)
Total Direct Cost: R$115,486

2023-2024 **Improving methods of detecting neuron-derived cfDNA in blood plasma: a new diagnostic approach for neurodegenerative conditions**
Utah State Alzheimer's Disease Research Consortium
Co-PIs: Jonathon Hill and Tim Jenkins
Total Direct Cost: $40,000

2023-2024 **Novel Epigenetic Test for the Treatment and Improvement of Longitudinal Health-Outcomes for Men with Severe Infertility**
NIH-NICHD: R44 HD112264-01
PI: Kristin Brogaard, Jonathon Hill (Co-Investigator)
Total Direct Cost: $207,000

2022-2023 **Novel Diagnostic Approach Using Leucine Zipper Conformational Switches**
B&B Diagnostics
PI: Jonathon Hill
Total Direct Cost: $10,000

2022-2023 **Fulbright Scholarship to Sequence the Genome of the Fire Sponge in Salvador, Brazil**
Fulbright Commission
PI: Jonathon Hill, Emilio Lanna (Co-Investigator)
Total Direct Cost: $20,000

2022-2026 **Novel Diagnostic and Research Sequencing Approaches Utilizing Nanopore Sequencing**
Renew Diagnostics (SRA)
PI: Timothy Jenkins, Jonathon Hill (Co-Investigator)
Total Direct Cost: $228,000

2019-2023 **Developing a CRISPR-based forward-genetic screening method in embryonic zebrafish**
NIH-NICHD: R15 HD098969-01
PI: Jonathon Hill
Total Direct Cost: $298,000

2019-2022 **Seeing Red: Recessive red pigeons as an innovative model to elucidate Sox10 function and evolution in vertebrate pigmentation**
NIH-NIGMS: R15 GM132858-01
PI: Eric Domyan, Jonathon Hill (Collaborator)
Total Direct Cost: $300,000

2019-2022 **Identifying and characterizing auditory- visual multisensory neurons in the optic tectum of zebrafish larvae.**
NIH-NICHD: R15 HD095737-01
PI: Arminda Suli, Jonathon Hill (Collaborator)
Total Direct Cost: $300,000

2019-2021 **Defining beta cell heterogeneity to expand functional beta cell mass as a treatment for Type 1 Diabetes**
Beatson Foundation
PI: Jeffery S. Tessem, Jonathon Hill (Co-PI)
Total Direct Cost: $200,000

2016-2018 **Exploring the function of Nr4a1 in the pancreatic beta cell during type 2 diabetes progression**
American Diabetes Association: 1-17-IBS-101
PI: Jeffery S. Tessem, Jonathon Hill (Co-PI)
Total Direct Cost: $345,000

2015-2020 **Genome-wide Analysis of Cardiac Development in Zebrafish**
NHLBI Cardiovascular Development Consortium: 2UM1HL098160
PI: H. Joseph Yost, Jonathon Hill (consortium member within Utah center)
Total Direct Costs: $2,500,000 for Utah center (Paid genomic sequencing costs for my lab)

2013-2015 **Elucidating the Gene Regulatory Network in the Embryonic Atrio-ventricular Canal**
NRSA Fellowship: NIH NHLBI F32HL115881
PI: Jonathon Hill, H. Joseph Yost (mentor)
Total Direct Costs: ~$156,570

Internal Funding

2025-2026 **Bobbitt Heart Research Award: Zebrafish Heart Genetics**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $10,000

2024-2025 **Teaching Enhancement Grant-Creation of Graphics and Animations for Cell Biology**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $10,000

2023-2024 **Bobbitt Heart Research Award: The role of Sytl5 in cardiac calcium signaling**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $25,000

2022-2023 **Bobbitt Heart Research Award: The role of Camta1 in the developing heart**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $10,000

2022-2023 **Tech Transfer Grant: Developing the Leucine Lock System**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $10,000

2021-2022 **Bobbitt Heart Research Award: A Forward Genetics Screen in Zebrafish**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $20,000

2020-2021 **Grants on the Edge: The role of Camta1 in the developing heart**

Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $10,000

2020-2021 **Interdisciplinary Grant (Track 3): The role of Camta1 in the developing heart**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $20,000

2020-2021 **Bobbitt Heart Research Award: Evolution of Tbx factors in fish species**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $15,000

2019-2020 **College Mentoring Award**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $5,000

2019-2020 **Grants on the Edge: Developing a CRISPR-based forward-genetic screening method in embryonic zebrafish**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $12,400

2018-2019 **Bobbitt Heart Research Award: Role of Camta1 in the developing heart**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $15,000

2017-2018 **Teaching Enhancement Grant-Creation of Instructional Videos for Cell Biology**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $10,000

2016-2017 **Teaching Enhancement Grant-Creation of Instructional Videos for Cell Biology**
Brigham Young University
PI: Jonathan Alder, Jonathon Hill
Total Direct Cost: $10,000

2015-2018 **New Faculty Award**
Brigham Young University
PI: Jonathon Hill
Total Direct Cost: $60,000

Journal Peer Reviews

Translational Medicine
IUBMB Life
Pediatric Intensive Care
Advanced Science
Science Advances
BMC Bioinformatics
Developmental Biology
Developmental Dynamics
Frontiers in Endocrinology
Nucleic Acid Research
Molecular Biology Reports
Communications Biology
Journal of Translational Medicine

Grant Reviews

Polish Academy of Sciences (ad hoc)
United Kingdom Research Institute (ad hoc)
National Institutes of Health

Open-Source Projects

MethylSeqR	**An R package for analyzing Nanopore methylation data** I designed key data structures and paradigms and supervised their implementation. Available at https://github.com/Wasatch-BioLabs-Bfx/MethylSeqR
Zemo	**Software and hardware for continuous monitoring and remote notification of aquaria conditions, including pH, Conductivity, Temperature and Dissolved Oxygen** I designed the hardware and supervised software development.
sangerseqR	**Software package for opening, viewing and manipulating sanger sequencing chromatograms in R (Bioconductor)** I conceived, developed and programmed the entire package. Available at http://www.bioconductor.org/packages/release/bioc/html/sangerseqR.html
MMAPPR	**Software package for identifying mutations underlying phenotypes in forward genetic screens** I conceived, developed and programmed the software. Available at http://yost.genetics.utah.edu/software.php

Patent Applications

Key: Doe, J. = Undergraduate Student, Doe, J. = Graduate Student

1. Pitt, B., Robinson, K., & **Hill, J. T.** (2025). Methods for removal of polymerase chain reaction contaminants or inhibitors from blood samples. (U.S. Provisional Patent No. 63/811,420). United States Patent and Trademark Office.
2. **Hill, J. T.**, Jenkins, T. G., & Jenkins, A. (2024). BRDGR-Bridge RNA recombinase targeted nucleotide enrichment and sequencing prep (U.S. Provisional Patent No. 63/735,023). United States Patent and Trademark Office.
3. **Hill, J. T.**, Jenkins, T. G., & Jenkins, A. (2024). Components and method for DNA sample native strand enrichment for nanopore sequencing (U.S. Provisional Patent No. 63/638,742). United States Patent and Trademark Office.
4. Bro, C. C., **Hill, J. T.**, Barrow, J., & Stark, M. (2024). Systems and methods for producing progeny with selective traits (U.S. Patent Application No. 18/593,658). United States Patent and Trademark Office.
5. **Hill, J. T.**, Stirland, I., Jenkins, T. G., & McQuhae, E. (2024). Detection of *B. burgdorferi* and other coinfector cfDNA in blood plasma: A diagnostic approach for Lyme disease (U.S. Provisional Patent No. 63/559,598). United States Patent and Trademark Office.
6. Yates, J. D., & **Hill, J. T.** (2024). Guide strand library construction and methods of use thereof (U.S. Patent Application No. 18/734,879). United States Patent and Trademark Office.
7. Moore, J., **Hill, J. T.**, & Jenkins, T. (2024). Quantifying frequencies of microbial species in the human gut microbiome (U.S. Provisional Patent No. 63/624,277). United States Patent and Trademark Office.
8. Yates, J. D., & **Hill, J. T.** (2023). Systems and methods for single cell detection of protein secretion (PCT International Application No. PCT/US2023/078542). World Intellectual Property Organization.
9. **Hill, J. T.**, & Jenkins, T. (2023). Methods and compositions for native methylation sequencing of enriched genomic regions (U.S. Provisional Patent No. 63/450,472). United States Patent and Trademark Office.
10. **Hill, J. T.** (2022). Peptide switch for controlling protein dimerization (PCT International Application No. PCT/US2022/070991). World Intellectual Property Organization.
11. **Hill, J. T.** (2021). Method for detection of viral infections using split enzymes (PCT International Application No. PCT/US2021/072739). World Intellectual Property Organization.
12. Yates, J. D., & **Hill, J. T.** (2020). Guide strand library construction and methods of use thereof (PCT International Application No. PCT/US2020/018701). World Intellectual Property Organization.

13. Yates, J. D., & **Hill, J. T.** (2019). Inventions for improving enzymatic CRISPR generation and reaction cleanup (U.S. Provisional Patent No. 62/807,679). United States Patent and Trademark Office.
14. Yates, J. D., & **Hill, J. T.** (2020). Methods and compositions for generating CRISPR guide RNA libraries (U.S. Patent No. 10,669,539). United States Patent and Trademark Office.
15. **Hill, J. T.**, & Sussel, L. (2011). Methods, systems, and media for identifying transcription factor binding sites (U.S. Patent Application No. 13/118,148). United States Patent and Trademark Office.

Courses Taught

2024-Current	**UNIV 101: BYU Foundations, BYU** Taught a new course to help freshmen succeed at BYU.
2018-2024	**CELL 570: Responsible Conduct of Research, BYU** Developed and taught a new course to meet the NIH and NSF research ethics requirements.
2017-Current	**CELL 550R: RNA-seq Data Analysis** Developed and taught a new course on how to design and analyze RNA-seq experiments.
2015-Current	**CELL 360: Cell Biology, BYU** Taught three lectures per week covering a broad range of topics, including cell/organelle structure, transcription and translation, protein transport, endocytosis, cell signaling, cell replication, and apoptosis.
2015-Current	**CELL 295R/495R: Mentored Research, BYU** Mentored an average of 15 undergraduate students each semester in my lab.
2016-2018	**PDBIO 601: Cell Biology, BYU** Taught the unit on the cellular and molecular mechanisms of cardiac physiology.

Mentored Undergraduate Students

Blayne Fekete
Adriana Lopez
Dawson Lybbert
Brad Atoa
Madison Tippets[1]
Spencer Coleman[1]
Joshua Yates[1,2,6]
Carson Russell[2]
Matthew “Quinn” Benson[1]
Jonathan Rawlins
Justin Ward
Zachary Frederich[1,2,5]
Annika Martin[1]
Morgan Fronk[1,3]
Kyle Johnsen[1]
Elizabeth Porter
Nathan Jenkins
Nathaniel Batey
Seth Johnsen[1,2]
Matthew Kern
Evangeline Friedbaum
Emily Henderson
Mary Taylor
Joshua Keller[1]
Lindsey Meservey[1]
Colby Nielsen[1]
JT Chapple[1,5]
Adam Bayer
Brendon Hogge
Hunter Giles[1,3]
Jake Selph[2,5]
Nathaniel Barton[1,2,4]
Olivia Fordiani
Carlissa Frederich[1,5]
Jordan Bothwell
Jason Olcott[2]
Julie Ann Goddard[1,5]
Claire Moore
Clayton Grundvig[1,5]
Noelle Nerenberg
Matthew Goff[1,5]
Spencer Wilson
Andrew Sessions
Megan Stephani
Idongesit Ekpo[1,3]
Conner Ward
James Wrengler
Hannah Abernathy
Preston Wahlquist
Benjamin Passey
Emi Ferderber
Andrew Jenkins[1,3,4,5]
William Nelson
Matthrew Hodgman[2]
Nicholas Baker
Glade Adams
Cayden Bro[1,5,7]
Philip Morrison[1,5,7]
Aidan Cardall[4]
Carson Miller
Kaitlyn Robinson[1]
Kellie Seely
Nathan Smith
Sophia Schroeder
Lucas Wang[1,5]
Bryce Johnson[1]
Benjamin Johnson
Jared Taylor[5]
Logan Melling
Isabelle Palmer
Ryan Halls[1]
Landon Parker
Natalia Laurence
Caroline Cook
E. Nicole Lopez
Madelin Morris
Wyatt Woffinden
Quentin Cook

Anna Barlow	Kenley Kohls[5]	Braden Betteridge
Alexander Curtis	Abby Papritz	Kade Griffths
Benjamin Guffey	Izaak Wallin	McKenzie Mitchell

1 = Poster Presentation 2 = Publication 3 = Honors Thesis 4 = Oral Presentation 5 = Undergraduate Grant (CURA)
6 = Patent Application 7 = Student Innovator of the Year Competition

Honors Student Committee Membership

2025	**Israel Aleman (Reader)** Extracellular Vesicle Markers of Disease Progression of Helicobacter Pylori Infection to Gastric Cancer
2024	**Andrew Jenkins (Chair)** Rapid Discovery of House-Keeping Genes in the Bacterium Kushneria, Using a Slalom-Library-Based Crispri Forward Genetic Screen
2023	**Allison Pickens (Reader)** Identifying and Knocking Out Deep Brain Photoreceptors in the Larval Zebrafish Optic Tectum
2022	**Joseph Sherman (Reader)** A Descriptive Analysis of Severe Maternal Morbidities in Southern Arizona
2020	**Idongesit Ekpo (Reader)** Building an INS-1 cDNA Library for a Genome-Wide Crispr-Cas9 Screen
2020	**Hunter Giles (Chair)** Evaluation and Improvement of a Novel Method for Rapid Promoter Characterization in a Zebrafish Model
2018	**Morgan Fronk (Chair)** Identifying the 5' End of the Camta1 Genes in Zebrafish
2018	**Teron Haynie (Reader)** Synthesis of Candidate Natural Killer T Cell Ligands

Mentored Graduate Students

2024-Current	**Carine Belau, Cell Biology and Physiology (PhD)** Genetics of sperm formation in the Sea Sponge *Tedania ignis*
2024-Current	**Kaitlyn Robinson, Cell Biology and Physiology (MS)** Developing a rapid test for sepsis
2022-Current	**Jouber Calixto, Cell Biology and Physiology (PhD)** Understanding the molecular mechanisms of Tbx5 ohnolog retention in the zebrafish
2021-2023	**Matthew Goff, Cell Biology and Physiology (MS)** Kinetic effects of unstable leucine zipper hairpins on protein binding
2018-2024	**Maliha Tasnim, Physiology and Developmental Biology (PhD)** Understanding the molecular mechanisms of Tbx2 ohnolog retention in the zebrafish
2016-2019	**Joshua Yates, Physiology and Developmental Biology (MS)** A CRISPR/Cas9 Tissue Specific Forward Genetic Screening Method in *D. rerio*

BYU Thesis/Dissertation Committee Membership

2024-Current	**Kutter Hine, Bioinformatics (MS)**
2024-Current	**Ashley Marcheschi, Genetics, Genomics and Biotechnology (MS)**

2023-Current	**Joseph Bush, Cell Biology and Physiology (PhD)**
2023-Current	**Bailey Calder, Cell Biology and Physiology (PhD)**
2023-Current	**Isaac Stirland, Cell Biology and Physiology (PhD)**
2021-Current	**Sebastian Valencia Amores, Cell Biology and Physiology (PhD)**
2020-Current	**Michael Von Gunten, Neuroscience (PhD)**
2020-2022	**Logan Edvalson, Nutrition, Physiology and Developmental Biology (MS)**
2020-2023	**Zachary Olsen, Physiology and Developmental Biology (MS)**
2019-Current	**Annalie Martin, Physiology and Developmental Biology (PhD)**
2019-2023	**Jacqueline Crabtree, Nutrition, Dietetics and Food Science (MS)**
2018-2020	**Chase Walton, Physiology and Developmental Biology (MS)**
2017-2024	**Jie (Bridget) Wu, Physiology and Developmental Biology (PhD)**
2017-2024	**Ifeanyichukwu Nwosu, Biology (PhD)**
2017-2020	**Kelsey Hirschi, Physiology and Developmental Biology (PhD)**
2017-2024	**Brandon Davies, Physiology and Developmental Biology (PhD)**
2017-2024	**Jacob Herring, Nutrition, Dietetics and Food Science (PhD)**
2017-2022	**Ted Piorczynski, Physiology and Developmental Biology (PhD)**
2016-2023	**David Bates, Microbiology and Molecular Biology (PhD)**
2016-2020	**Micah Ross, Physiology and Developmental Biology (PhD)**
2015-2017	**Ting Chen, Physiology and Developmental Biology (PhD)**

External Thesis/Dissertation Committee Membership

2023-Current	Bruno Cajado Gouveia, Universidade Federal da Bahia, Brazil (PhD)
2026	Amanda de Graça Melo, Universidade Federal da Bahia, Brazil (Dissertation Defense)

Guest Lectures and Educational Outreach

2025	**Genome Sequencing and Assembly using Oxford Nanopore at the Federal University of Bahia, Salvador, Brazil** Worked with a graduate student to create course materials in Portuguese and then taught the course to ~30 students in Portuguese as a four-week hands-on course.
2023	**RNA-seq Data Analysis at the Federal University of Bahia, Salvador, Brazil** Worked with a team of students to translate course materials to Portuguese and then taught my RNA-seq data analysis course to ~30 students in Portuguese as a two-week intensive course.
2017-2019	**Zenetics: Zebrafish Genetics and Natural Selection** Developed and taught a one-week curriculum using a zebrafish mating experiment in fifth grade classrooms to teach genetics and natural selection. The course met all of the Utah curriculum standards for fifth grade biology while offering a hands-on science experience.
2017-2018	**CellClips Tutorials YouTube Channel Project Lead** I led a group of students in a project to create a series of 12 YouTube videos to teach key Cell Biology concepts. I oversaw the students involved in all aspects of the project, including writing, recording, animating, and editing the videos.

2016 **Guest Lecturer on Genomic Analysis of Time-course Data, Ohio State University**
Gave two lectures with an assignment in between to help graduate students at Ohio State University learn how to analyze complex RNA-seq datasets, including time course data analysis and identification of interactions in factorial designs.

2008-2009 **SMDEP Biology Course Instructor, Columbia University**
Developed curriculum for and taught a biology course as part of a program to help minority students prepare for medical or dental school.

2004-2005 **Teaching Assistant, Brigham Young University**
Aided student instruction for two courses: Introduction to Genetics and Microbiology Lab. Duties included lab demonstrations, preparing quizzes, conducting review sessions, grading papers, and answering student questions.

Brigham Young University Service

2023-2025 **Life Sciences College Genetics/Molecular/Cell Curriculum Committee**
Member of a committee evaluating ways to streamline and improve curriculum across three majors.

2022-Current **Chair of the Cell Biology and Physiology Department Research Committee**
Chaired the department research committee consisting of five members. Efforts included adding a career paths seminar series, increasing external research funding in the department, and helping new professors start their research programs.

2021-2022 **Member of the Cell Biology and Physiology Department Faculty Search Committee**
Helped advertise, vet, and interview potential faculty members for the department during two searches. I also led the teaching evaluation and student feedback data analysis.

2021 **Life Sciences College Genomics Curriculum Committee**
Chair of an ad hoc committee to evaluate and propose curriculum changes to genomics courses in the college.

2021 **Life Sciences College Statistics Curriculum Committee**
Member of an ad hoc committee to evaluate and propose curriculum changes to statistics courses in the college.

2019-2022 **Cell Biology and Physiology Department Graduate Committee**
Member of a standing committee to guide our graduate program. I led an effort to re-evaluate and modify our graduate program requirements for curriculum and helped with recruiting and setting graduate standards in the department.

2015-2019 **Physiology and Developmental Biology Department Curriculum Committee**
Member of standing committee to review and address curriculum issues for the Physiology and Developmental Biology, Biophysics and Neuroscience majors.

2015-2019 **Office of Research and Creative Activities (ORCA) Reviewer**
Reviewed 10-12 student and internal university grant applications each year

2015-2016 **University Internal Grant Reviewer**
Reviewed internal grant applications for the John A. Widstoe and David O. McKay grants

Other Service

2012-2013 **Member of the Society of Developmental Biology Southwest Meeting Organizing Committee**
Oversaw development of meeting website, abstract book and email campaign and participated in planning tasks.

2011-2015	**Member of the NHLBI Bench-to-Bassinet Consortium Bioinformatics Committee** Participated in monthly phone conferences and in-person meetings to present, discuss and plan work in the consortium to analyze, store and share genomic datasets.
2010-2018	**Portuguese to English Translator, American Journal Experts** Translate scientific articles from Portuguese to English

Awards and Honors

2023	**Distinguished Professor, Cell Biology and Physiology Department, BYU**
2022-2023	**Fulbright Scholarship to Salvador, Brazil**
2022	**BYU Early-Career Teaching Award**
2013	**Best Postdoc Presentation, SDB Southwest Regional Meeting**
2012-2016	**NIH Extramural Loan Repayment Program**
2010	**PhD awarded with Distinction, Columbia University**
2008-2010	**NIH Pre-Doctoral Training Grant in Endocrinology**
2007,2008,2009	**Beta Cell Biology Consortium Student Travel Scholarship**
2006-2007	**NIH Pre-Doctoral Training Grant in Molecular Biology**
2004	**ORCA Research Grant, Brigham Young University**
1999-2005	**Heritage Scholarship (Full Tuition), Brigham Young University**