

Jonathon T Hill, PhD

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Education and Employment

Asst. Prof. 2015-Current	Brigham Young University Dept. of Physiology and Developmental Biology
Postdoc 2010-2015	University of Utah , H. Joseph Yost, PhD “Genetic and epigenetic regulation of heart development”
Ph.D. 2007-2010	Columbia University , Lori Sussel, PhD “Nkx2-2 regulation during pancreas development” <i>Awarded with Distinction</i>
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 <i>Mycobacterium ulcerans</i> ”

Publications

1. **Hill, JT**, Demarest, B, Gorski, B, Smith, M, Yost, HJ. (2017). Heart morphogenesis gene regulatory networks revealed by temporal expression analysis. *Development*, 144(19), 3487-3498.
2. Karanth S, Zinkhan EK, **Hill JT**, Yost HJ, Schlegel A. (2016). FOXN3 Regulates Hepatic Glucose Utilization. *Cell Rep* 15: 2745–2755.
3. Ray JD, Kener KB, Bitner BF, Wright BJ, Ballard MS, Barrett EJ, **Hill JT**, Moss LG, Tessem JS. (2016). Nkx6.1-mediated insulin secretion and β -cell proliferation is dependent on upregulation of c-Fos. *FEBS Lett* 590: 1791–1803.
4. **Hill JT**, Demarest BL, Bisgrove, BW, Su Y, Smith M, Yost HJ. (2014). Poly Peak Parser: Method and software for identification of unknown indels using Sanger Sequencing of PCR products. *Developmental Dynamics* 243(12), 1632–1636.
5. Sarkar AA, Nuwayhid SJ, Maynard TM, Ghandchi F, **Hill JT**, Lamantia AS, Zohn IE. (2014). Hectd1 is Required for Development of the Junctional Zone of the Placenta. *Developmental Biology* 392(2):368-80.
6. **Hill JT**, Demarest BL, Bisgrove BW, Gorski B, Su Y, Yost HJ. (2013). MMAPPR: Mutation Mapping Analysis Pipeline for Pooled RNA-seq. *Genome Research* 23(4):687-97. *Highlighted in Nature Reviews Genetics*.
7. Maguire CT, Demarest BL, **Hill JT**, Palmer JD, Brothman AR, Yost HJ, Condic ML. (2013). Genome-wide Analysis Reveals the Unique Stem Cell Identity of Human Amniocytes. *Plos One* 7(12): e520267.
8. Arnes L*, **Hill JT***, Gross S, Magnuson MA, Sussel L. (2012). Ghrelin expression in the mouse pancreas defines a unique multipotent progenitor population. *Plos One* 7(12): e520267.

9. **Hill JT**, Anderson KR, Mastracci TL, Kaestner KH, and Sussel L. (2011). Novel computational analysis of protein binding microarray data identifies direct targets of Nkx2-2 in the pancreas. *BMC Bioinformatics* 12, 62.
10. **Hill JT***, Chao CS*, Anderson KR, Kaufman F, Johnson CW, Sussel L. (2010). Nkx2-2 activates the ghrelin promoter in pancreatic islet cells. *Molecular Endocrinology* 24, 381-90.
11. **Hill JT**, Mastracci TL, Vinton C, Doyle ML, Anderson KR, Loomis ZL, Schrunk JM, Minic AD, Prabakar KR, Pugliese A, Sun Y, Smith RG, Sussel L. (2009). Ghrelin is dispensable for embryonic pancreatic islet development and differentiation. *Regulatory Peptides* 157, 51-6.

Invited Presentations

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| 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 |

Posters and Oral Presentations

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| 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) |

- 2010 **Genome-wide Prediction of Nkx2.2 Binding Sites**
Columbia University Dept. of Genetics and Development Retreat (Oral)
- 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)

Research Fellowships and Grants

- 2016-Current **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-Current **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

Journal Peer Reviews

BMC Bioinformatics
Developmental Biology
Developmental Dynamics

Open Source Projects

- 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. Available at <https://www.zemoproject.org/>
- 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

2017 Yates JD, Hill JT. **Methods and Compositions for Generating CRISPR Guide RNA Libraries (15/727,279)**
Developed and patented a method for creating CRISPR sgRNA libraries enzymatically

2011 Hill JT, Sussel L. **Methods, Systems, and Media for Identifying Transcription Factor Binding Sites (13/118,148)**
Developed and patented a computational algorithm for identifying transcription factor binding sites using protein binding microarrays

Courses Taught

2018-Current **PDBIO 570: Responsible Conduct of Research, BYU**
Developed a new course to meet the NIH and NSF research ethics requirements.

2015-Current **PDBIO 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 **PDBIO 494R/495R: Mentored Research, BYU**
Mentored an average of 15 undergraduate students each semester in my lab.

2016-Current **PDBIO 601: Cell Biology, BYU**
Taught a lecture and literature review on the cellular and molecular mechanisms of cardiac physiology.

Mentored Undergraduate Students

Blayne Fekete	Matthew "Quinn" Benson*	Nathan Jenkins
Adriana Lopez	Jonathan Rawlins	Nathaniel Batey
Dawson Lybbert	Justin Ward	Seth Johnsen*
Brad Atoa	Zachary Frederick	Matthew Kern
Madison Tippets*	Annika Martin*	Evangeline Friedbaum
Spencer Coleman*	Morgan Fronk	Emily Henderson
Joshua Yates*	Kyle Johnsen*	Mary Taylor
Carson Russell	Elizabeth Porter	

* = Poster Presentation

Mentored Graduate Students

2016-Current **Joshua Yates, Physiology and Developmental Biology (MS)**
A CRISPR/Cas9 Tissue Specific Forward Genetic Screening Method in *D. rerio*

Graduate Committee Membership

2017-Current	Kelsey Hirschi, Physiology and Developmental Biology (PhD) Committee Member
2017-Current	Jacob Herring, Nutrition, Dietetics and Food Science (PhD) Committee Member
2017-Current	Ted Piorczynski, Physiology and Developmental Biology (PhD) Committee Member
2016-Current	David Bates, Microbiology and Molecular Biology (PhD) Committee Member
2016-Current	Micah Ross, Physiology and Developmental Biology (PhD) Committee Member
2015-2017	Ting Chen, Physiology and Developmental Biology (PhD) Committee Member

Guest Lectures and Other Teaching

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

2015-Current	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-Current	Office of Research and Creative Activities (ORCA) Reviewer Reviewed 10-12 student 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-Current **Portuguese to English Translator, American Journal Experts**
Translate scientific articles from Portuguese to English

Awards and Honors

- 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**