

**Mark Zielinski, Ph.D.**  
Data Scientist, Scipher Medicine

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**EDUCATION**

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- 2013-2020      **Brandeis University**  
*M.S., Ph.D., Neuroscience - Quantitative Biology Specialization*  
Advisor: Dr. Shantanu Jadhav
- 2007-2011      **University of Chicago**  
*B.A., Biology- Specialization in Neuroscience*  
*Minor, Computational Neuroscience*

**RESEARCH EXPERIENCE**

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- 2013-2020      **Brandeis University, Waltham, MA**  
*Graduate Student, Ph.D. candidate, Postdoctoral Scholar*  
Advisor: Dr. Shantanu Jadhav
- 2011-2013      **University of Chicago Medical Center, Chicago, IL**  
*Research Technologist, Islet Research Lab*  
Advisor: Dr. Manami Hara, Dr. Graeme Bell
- 2009-2011      **University of Chicago, Chicago, IL**  
*Research Assistant, Somatosensory Research Lab*  
Advisor: Dr. Sliman Bensmaia

**PUBLICATIONS**

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Pending: **MC Zielinski**, JD Shin, SP Jadhav. Hippocampal theta sequences in REM sleep during spatial learning. bioRxiv 2021.04.15.439854; doi: <https://doi.org/10.1101/2021.04.15.439854>

1. **MC Zielinski**, JD Shin, SP Jadhav. Coherent Coding of Spatial Position Mediated by Theta Oscillations in the Hippocampus and Prefrontal Cortex. *Journal of Neuroscience*. 2019;39(23):4550-4565; DOI:10.1523/JNEUROSCI.0106-19.2019
2. **MC Zielinski**, W Tang, SP Jadhav. The role of replay and theta sequences in mediating hippocampal-prefrontal interactions for memory and cognition. *Hippocampus*. 2017;10.1002/hipo.22821
3. AE Papale, **MC Zielinski**, LM Frank, SP Jadhav, AD Redish. Interplay between hippocampal sharp wave ripple events and vicarious trial and error behaviors in decision making. *Neuron*. 2016;92(5):975-982.
4. SA Greeley, **MC Zielinski**, A Poudel, H Ye, S Berry, JB Taxy, D Carmody, DF Steiner, LH Philipson, JR Wood, M Hara. Preservation of Reduced Numbers of Insulin-Positive Cells in Sulfonylurea-Unresponsive KCNJ11-Related Diabetes. *Journal of Clinical Endocrinology and Metabolism*. 2017;102(1):1-5.
5. A Poudel, JL Fowler, **MC Zielinski**, G Kilimnik, M Hara. Stereological analyses of the whole human pancreas. *Scientific Reports*. 2016;6:34049.
6. Bailey KA, Savic D, **Zielinski M**, Park S-Y, Wang L, Witkowski P, Brady M, Hara M, Bell GI, Nobrega MA. Evidence of non-pancreatic beta cell-dependent roles of Tcf7l2 in the regulation of glucose metabolism in mice. *Human molecular genetics*. 2015;24(6):1646–1654.
7. Gołąb K, Kizilel S, Bal T, Hara M, **Zielinski M**, Grose R, Savari O, Wang X-J, Wang L-J, Tibudan M. Improved Coating of Pancreatic Islets With Regulatory T cells to Create Local Immunosuppression by Using the Biotin-polyethylene Glycol-succinimidyl Valeric Acid Ester Molecule. *Transplantation proceedings*. 2014;46(6):1967–1971.
8. Manfredi LR, Saal HP, Brown KJ, **Zielinski MC**, Dammann JF, Polashock VS, Bensmaia SJ. Natural scenes in tactile texture. *Journal of neurophysiology*. 2014;111(9):1792–1802.
9. Savari O, **Zielinski MC**, Wang X, Misawa R, Millis JM, Witkowski P, Hara M. Distinct function of the head region of human pancreas in the pathogenesis of diabetes. *Islets*. 2013;5(5):226–228.
10. Wang X, Misawa R, **Zielinski MC**, Cowen P, Jo J, Periwal V, Ricordi C, Khan A, Szust J, Shen J. Regional differences in islet distribution in the human pancreas--preferential beta-cell loss in the head region in patients with type 2 diabetes. *PLoS One*. 2013;8(6).
11. Wang X, **Zielinski MC**, Misawa R, Wen P, Wang T-Y, Wang C-Z, Witkowski P, Hara M. Quantitative analysis of pancreatic polypeptide cell distribution in the human pancreas. *PloS one*. 2013;8(1):e55501.
12. Kilimnik G, Jo J, Periwal V, **Zielinski MC**, Hara M. Quantification of islet size and architecture. *Islets*. 2012;4(2):167–172.

13. Manfredi LR, Baker AT, Elias DO, Dammann III JF, **Zielinski MC**, Polashock VS, Bensmaia SJ. The effect of surface wave propagation on neural responses to vibration in primate glabrous skin. *PLoS one*. 2012;7(2):e31203.

#### **ABSTRACTS/ CONFERENCE PROCEEDINGS**

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1. **MC Zielinski**, JD Shin, SP Jadhav. Coherent coding of spatial position in prefrontal cortex and hippocampus on a theta timescale. Poster presented at the 48th annual meeting of the Society for Neuroscience, San Diego, CA [Abstracts of the Society for Neuroscience 48: 424.03]

2. **MC Zielinski**, JD Shin, SP Jadhav. Sequential activity during hippocampal theta supports distinct prefrontal representations. Poster presented at the 47th annual meeting of the Society for Neuroscience, Washington, DC [Abstracts of the Society for Neuroscience 47: Diversity Poster Session, ME05.141]

3. **MC Zielinski**, AE Papale, AD Redish, LM Frank, SP Jadhav. Disrupting awake sharp-wave ripples increases vicarious trial and error behavior. Poster presented at the 45th annual meeting of the Society for Neuroscience, Chicago, IL [Abstracts of the Society for Neuroscience 45: 86.07]

4. AE Papale, **MC Zielinski**, LM Frank, SP Jadhav, AD Redish. Sequential activity during theta and sharp wave ripples supports flexible decision making. Poster presented at the 45th annual meeting of the Society for Neuroscience, Chicago, IL [Abstracts of the Society for Neuroscience 45: 86.04]

5. **Zielinski MC**, Wang X, Misawa R, Wang L-J, Witkowski P, Hara M. Histological Analysis of the Whole Human Pancreas in Health and Disease. *Amer Diabetes Assoc* 1701 N Beauregard St, Alexandria, VA 22311-1717 USA; 2013. p. A563–A563.

6. Greeley SAW, **Zielinski MC**, Wood JR, Steiner DF, Bell GI, Philipson LH, Hara M. Fewer Beta Cells and Insulin Granules in Autopsy Histology of a Patient With Sulfonylurea-Unresponsive KCNJ11 Neonatal Diabetes. *Amer Diabetes Assoc* 1701 N Beauregard St, Alexandria, VA 22311-1717 USA; 2013. p. A562–A562.

7. Golab K, Kizilel S, Bal T, Hara M, **Zielinski M**, Wang X-J, Grzanka J, Wang L-J, Cochet O, Tibudan M. Biotin-PEG-SVA as a more Effective Linking Molecule in Comparison to Biotin-PEG-NHS for Coating of Pancreatic Islets with Regulatory T Cells (Tregs) to Create Local Immunoprotection-Optimization of the Method. *TRANSPLANTATION*. Lippincott Williams & Wilkins 530 Walnut St, Philadelphia, PA 19106-3621 USA; 2013. Vol. 96, No. 6, p. S63-S63.

8. Golab K, Kizilel S, Bal T, Hara M, **Zielinski M**, Wang X, Grzanka J, Wang L, Cochet O, Tibudan M. Optimization of the Coating of Pancreatic Islets with T Regulatory Cells in the Novel Immunoprotective Approach. *Wiley-Blackwell* 111 River St, Hoboken 07030-5774, NJ USA; 2013. p. 242–242.

9. **Zielinski MC**, Wang X, Dilorio P, Jo J, Perival V, Misawa R, Witkowski P, & Hara M. (2012). Pancreatic islet development and aging in humans. Poster presentation at 7th Annual Chicago

Diabetes Day, Chicago, IL.

**10. Zielinski MC**, Wang X, Dilorio P, Jo J, Periwal V, Misawa R, Witkowski P, & Hara M. (2012). Pancreatic islet development and aging in humans. Poster presentation at 2012 Beta Cell Biology Consortium Retreat, Chantilly, VA.

**11.** Manfredi LR, Dammann JF, **Zielinski MC**, Polashock VS, Baker AT, & Bensmaia SJ. (2011). The statistics of natural scenes in tactile perception. Poster presented at the 41st annual meeting of the Society for Neuroscience, Washington DC [Abstracts of the Society for Neuroscience 41: 704.13]

## INSTITUTIONAL TALKS

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### Graduate Research Seminar

2018 Coherent coding of spatial position in prefrontal cortex and hippocampus

2017 Role of hippocampal and prefrontal neural activity patterns in decision making

2016 Role of hippocampal neural activity patterns in memory guided behavior

### Neuroscience Department Journal Club

2018-2019 Presentation of: DOI: 10.1038/s41593-018-0256-4

A corticopontine circuit for initiation of urination

2017-2018 Presentation of: DOI: 10.1038/nature21692

Mapping of a non-spatial dimension by the hippocampal-entorhinal circuit.

2016-2017 Presentation of: DOI: <http://dx.doi.org/10.7554/eLife.13998.001>

Adult axolotls can regenerate original neuronal diversity in response to brain injury.

2015-2016 Presentation of: DOI:10.1038/nature14031

Three-dimensional head-direction coding in the bat brain.

### Computational and Systems Neuroscience Journal Club

2016-2017 Presentation of: DOI: 10.1038/nn.4507

Hippocampal awake replay in fear memory retrieval.

2015-2016 Presentation of: DOI: 10.1126/science.aaa9633

Autoassociative dynamics in the generation of sequences of hippocampal place cells.

### Quantitative Biology Journal Club

2015 How to make a pizza from scratch- Food science, chemistry, and botany of flavor and cooking

## TEACHING EXPERIENCE

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Fall 2015 Data Analysis and Statistics Workshop

Fall 2015 Computational Neuroscience

Spring 2016 General Biology Laboratory

Fall 2017      Data Analysis and Statistics Workshop

### **SCHOLARSHIPS, HONORS, AND AWARDS**

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2017            Neuroscience Scholars Program Professional Development Award  
 2016            Top 10% Kaggle Ranking- Melbourne Univ. AES/MathWorks/NIH Seizure Prediction  
 2016-2018      Neuroscience Scholars Program (NSP)- Associate  
 2012            Best Poster Award, 7th Annual Chicago Diabetes Day  
 2011            Grant Finalist and Recipient, University of Chicago Uncommon Fund  
 2009-2012      Scholarship Recipient, Cystic Fibrosis Scholarship Foundation  
 2009-2012      Keynote Speaker, Cystic Fibrosis Scholarship Foundation  
 2010-2011      University of Chicago Dean's List  
 2008-2011      University of Chicago Odyssey Scholarship Recipient

### **SCIENTIFIC MEMBERSHIPS AND ASSOCIATIONS**

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2016- 2018            Neuroscience Scholars Program(NSP)- Associate  
 2014- Present American Association for the Advancement of Science (AAAS)  
 2013- Present Society for Neuroscience (SfN)

### **COURSES AND CERTIFICATIONS**

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2013            Coursera - Machine Learning, Dr. Andrew Ng  
 2013            Coursera - Introduction to Data Science, Dr. Bill Howe

### **SKILLS**

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Matlab, Python, Git, Linux, Fiji/ImageJ, PCB design (Autodesk Eagle), some 3D modeling (Autodesk Inventor), SQL, R, Tableau

Data Analysis, Statistics, Signal Processing, Exploratory Data Analysis, Data Mining and Visualization, some Machine Learning and Big Data

Research, Experimental Design, Grant Writing, Teaching, Mentoring, Scientific Writing, Grant Writing, Histology and Immunohistochemistry, Aseptic Surgery, Animal Models of Disease and Behavior- Rat, Mouse, some NHP

Neuroscience, Systems Neuroscience, Computational Neuroscience, Behavioral Neuroscience, Electrophysiology, *in-vivo* Extracellular Electrophysiology, Neurobiology, Neuroanatomy, Neurophysiology, some Computational Biology, Endocrinology

Polish, some Spanish