

## CURRICULUM VITAE

**Kate Molloy O'Neill, Ph.D.**

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U.S. Citizen

## EDUCATION

### UNDERGRADUATE

Princeton University, Princeton, NJ 2007-2011  
B.S.E., Chemical & Biological Engineering (awarded May 2011)  
Undergraduate thesis title: "Revealing the patterning potential of the terminal system in the *Drosophila* embryo"  
Mentor: Dr. Stanislav Y. Shvarstman

### GRADUATE

Rutgers University, Piscataway, NJ 2011-2017  
Ph.D., Biomedical Engineering (awarded May 2017)  
Dissertation title: "The role of Brain-Derived Neurotrophic Factor in the regulation of dendritic arbor morphology, neuronal network activity, and neuroprotection"  
Advisor: Dr. Bonnie L. Firestein

## POSTDOCTORAL TRAINING

Joint Postdoctoral Fellow 2017-present  
University of Maryland College Park, Department of Physics, Institute for Physical Science and Technology, Advisor: Dr. Wolfgang Losert  
National Institute of Neurological Disorders and Stroke of the National Institutes of Health, Axon Guidance and Neural Connectivity Section, Advisor: Dr. Edward Giniger

## FELLOWSHIPS AND GRANTS

### U.S. Dept. of Education

Awarded a one-year predoctoral fellowship for \$48,959 9/1/2016-6/30/2017  
Rutgers GAANN Program in "Personalized & Precision Medicine"

### New Jersey Commission on Brain Injury Research

Awarded a three-year predoctoral fellowship for \$100,500 7/1/2013-6/30/2016  
Project title: "The Neuroprotective Effects of BDNF after TBI"

### National Institutes of Health

Awarded a two-year predoctoral fellowship for \$56,000 9/1/2011-6/30/2013  
Rutgers-RWJMS Biotechnology Training Program

## HONORS AND AWARDS

|  |         |
|--|---------|
| Trainee Professional Development Award, Society for Neuroscience           | 8/2016  |
| Honorable Mention, Dissertation Fellowship Competition, Ford Foundation    | 6/2016  |
| Region E Scholarship, Society of Women Engineers                           | 6/2016  |
| Conference Travel Award, Graduate School of New Brunswick, Rutgers Univ.   | 11/2015 |
| STRIDES® Scholarship, Executive Women of New Jersey                        | 8/2015  |
| Conference Travel Award, Graduate School of New Brunswick, Rutgers Univ.   | 7/2013  |
| Outstanding Senior Thesis Award, Chem. & Biol. Eng. Dept., Princeton Univ. | 5/2011  |

## PROFESSIONAL ORGANIZATIONS AND ACTIVITIES

### ORGANIZATIONS

Member of Biomedical Engineering Society (BMES; 4/2013-present), Society for Neuroscience (SfN; 4/2014-present), Society of Women Engineers (SWE; 5/2015-present), American Association for the Advancement of Science (AAAS; 12/2015-present), Graduate Women in Science (GWIS; 7/2016-present), and American Physical Society (APS; 10/2018-present).

### ACTIVITIES

|   |                |
|---|----------------|
| JTEHM Student Editorial Board Member                                | 7/2018-present |
| IEEE Journal of Translational Engineering in Health and Medicine    |                |
| Nanosymposium Chair   | 11/2017        |
| Control of Neuronal Firing, Society for Neuroscience Annual Meeting |                |
| Ad hoc reviewer for Physical Review Letters                         | 9/2013-present |

## PUBLICATIONS

### PUBLISHED WORKS

- O'Neill KM**<sup>¶</sup>, Donohue KE<sup>¶</sup>, Omelchenko A, Firestein BL. "The 3' UTRs of Brain-Derived Neurotrophic Factor transcripts differentially regulate the dendritic arbor." *Front Cell Neurosci.* 2018 Mar 7;12:60. PMCID: PMC5845904.  
<sup>¶</sup> equal contribution
- Rodríguez AR, **O'Neill KM**, Swiatkowski P, Patel MV, Firestein BL. "Overexpression of cypin alters dendrite morphology, single neuron activity, and network properties via distinct mechanisms." *J Neural Eng.* 2018 Feb;15(1):016020. PMCID: PMC5797707.
- O'Neill KM**<sup>¶</sup>, Kwon M<sup>¶</sup>, Donohue KE, Firestein BL (2017). "Distinct effects on the dendritic arbor occur by microbead versus bath administration of Brain-Derived Neurotrophic Factor." *Cellular and Molecular Life Sciences* 74(23): 4369-4385. PMCID: PMC5819737.  
<sup>¶</sup> equal contribution
- O'Neill KM**, Akum BF, Dhawan ST, M Kwon M, Langhammer CG, Firestein BL (2015). "Assessing effects on dendritic arborization using novel Sholl analysis." *Frontiers in Cellular Neuroscience* 9: 285. PMCID: PMC4519774.
- Kim Y, Iagovitina A, Ishihara K, **Fitzgerald KM\***, Deplancke B, Papatsenko D, Shvartsman SY (2013). "Context-dependent transcriptional interpretation of MAPK signaling in *Drosophila* embryo." *Chaos* 23(2): 025105. PMCID: PMC3689791.  
\*maiden name

## PUBLICATIONS (cont'd)

### WORKS SUBMITTED, ACCEPTED, OR UNDER REVISION

6) Krzyszczyk PY, Acevedo A, Davidoff EJ, Timmins LM, Marrero-Berrios I, Patel M, White C, Lowe C, Sherba JJ, Hartmanshenn C, **O'Neill KM**, Balter ML, Androulakis IP, Schloss RS, Yarmush ML (2018). "The Growing Role of Precision and Personalized Medicine for Cancer Treatment." *Technology* (Submitted).

7) Lescak E<sup>¶</sup>, **O'Neill KM**<sup>¶#</sup>, Collu GM, Das S (2018). "Ten Simple Rules for providing a meaningful research experience to high school students." *PLoS Computational Biology* (Submitted).

<sup>¶</sup> equal contribution, # corresponding author

## PRESENTATIONS

### NATIONAL CONFERENCES (past 5 years)

1) **O'Neill KM**, Losert W (2019 – Upcoming). "Controlling the relationship between cytoskeletal and electrical dynamics in neuronal model systems." *American Physical Society's Annual March Meeting* (Oral Presentation, Controlling Cells with Electric Fields). **Invited talk.**

2) **O'Neill KM**, Gates SJ, Alvarez PH, Wang Y, Li H, Qing Q, Ortiz G, Miller E, Brenowitz SD, Losert W (2018). "Investigating the internal responses of neurons and neuron-like cells to external electric fields." *Annual Meeting of the Biomedical Engineering Society* (Poster Presentation 824, Atlanta, GA). 18 Oct 2018.

3) **O'Neill KM**, Firestein BL (2017). "BDNF regulates the development of electrical activity in hippocampal neuron networks cultured on microelectrode arrays." *Annual Meeting of the Society for Neuroscience* (Oral Presentation, Control of Neuronal Firing 542.04, Washington, D.C.). 14 Nov 2017.

4) **O'Neill KM**, Firestein BL (2016). "The role of BDNF in the protection of hippocampal neuron networks after glutamate-induced excitotoxicity." *Annual Meeting of the Society for Neuroscience* (Poster Presentation 605.09, San Diego, CA). 15 Nov 2016.

5) **O'Neill KM**, Firestein BL (2016). "Microelectrode array analysis of neuroprotection after glutamate-induced excitotoxicity." *Annual Meeting of the Biomedical Engineering Society* (Oral Presentation, Neural Cell Model Systems Fri – 3 – 11, Minneapolis, MN). 7 Oct 2016.

6) **O'Neill KM**, Akum BF, Dhawan ST, Kwon M, Langhammer CG, Firestein BL (2015). "Cypin overexpression distinctly alters dendrite arborization at different developmental time points as shown by novel Sholl analyses." *Annual Meeting of the Society for Neuroscience* (Oral Presentation, Dendritic Growth and Branching 278.10, Chicago, IL). 19 Oct 2015.

7) **O'Neill KM**, Siu T, Shinbrot T, Firestein BL (2015). "Neuronal response after injury in simulated and cultured networks." *Annual Meeting of the Biomedical Engineering Society* (Oral Presentation, Neuro-rehabilitation Fri – 1 – 9, Tampa, FL). 7 Oct 2015.

8) Siu T, **O'Neill KM**, Shinbrot T (2015). "Pattern learning, damage, and repair within biological neural networks." *American Physical Society's Annual March Meeting* (Oral Presentation, J47.00007, San Antonio, TX). 3 Mar 2015.

9) **O'Neill KM**, Siu T, Mattson G, Shinbrot T, Firestein BL (2014). "Learned stimulus response in experimental and simulated neural networks." *Annual Meeting of the Biomedical Engineering Society* (Poster Presentation 296, San Antonio, TX). 23 Oct 2014.

## LEADERSHIP AND SERVICE

### POSTDOCTORAL

#### **Losert Laboratory, University of Maryland College Park**

Project Mentor

9/2017-present

- Mentor to post-baccalaureate student (Fall 2017-present).
- Mentor to 2 physics undergraduates in PHYS 299B course (Spring 2018).
- Mentor to 1 Biochemistry undergraduate student (Fall 2017-present).
- Mentor to 1 Eleanor Roosevelt high school student (Summer 2018-present).
- Mentor to 1 senior Biochemistry undergraduate student (Fall 2018-present).

#### **HiSTEP, Office of Intramural Training & Education, NIH**

High School Scientific Training and Enrichment Program

Volunteer tutor

Summer 2018

#### **GRAD-MAP Winter Workshop, University of Maryland College Park**

Graduate Resources for Advancing Diversity with MD Astronomy & Physics

Mentor and tutor

1/2018

#### **Physics is Phun, University of Maryland College Park**

Volunteer presenter

12/2017

#### **CU2MiP, University of Maryland College Park**

Conference for Undergraduate Underrepresented Minorities in Physics

Laboratory tour guide

10/2017

### GRADUATE

#### **Firestein Laboratory, Rutgers University**

Project Mentor

9/2012-6/2017

- Mentor to 1 Molecular Biosciences rotation student (Fall 2012).
- Mentor to 1 undergraduate student (Biology) and 3 high school students. Supervised two independent projects (Summer 2013).
- Supervised Senior Design team (BME, 3 students; 9/2013-5/2014). First place in Senior Design Competition, Tissue Engineering category.
- Supervised Freehold, NJ, high school student's junior research project (9/2013-6/2014). First place, Monmouth Junior Science Symposium.
- Guided 1 undergraduate student (Biology) through summer research and research for credit (6/2014-5/2015).
- Guided 1 undergraduate student (Genetics) through research for credit (9/2015-5/2016) and honors thesis (9/2016-5/2017). Won Henry Rutgers Scholar Award and MacMillan Award for Research Excellence for thesis.

#### **GradFund, Rutgers University**

Peer Mentor

6/2016-6/2017

- Assisted graduate students with identifying, applying for, and incorporating feedback into fellowship applications.
- Wrote blog posts (<https://gradfund.rutgers.edu/blog/author/kate-oneill/>).

#### **Precision and Personalized Medicine Seminar Series, Rutgers University**

Coordinator and Host

9/2016-5/2017

- Worked with other Biomedical Engineering GAANN fellows to coordinate seminar series. Responsible for planning, hosting, and scheduling 2 of 8 speakers.

**LEADERSHIP AND SERVICE (cont'd)****GRADUATE (cont'd)****New Brunswick High School, New Brunswick, NJ**

Volunteer instructor, freshman physics class (1x/2 wks) 1/2013-6/2017

- Led daily lessons, group activities, and laboratories at urban school.
- Delivered research presentation at end of school year and informed students about scholarships to encourage them to pursue science careers.
- Expanded Neuroscience Day program to bring students to Rutgers (2014, 2016, 2017).
- Improved Spanish language to volunteer in bilingual class (9/2014-6/2017).

**Upward Bound Institute, Rutgers University**

Lead coordinator for Neuroscience Day 7/2015-6/2017

**Summer Science Scholars Academy (S3A), Rutgers RWJMS**

Research Day Mentor Summers 2012-2016

**Math Science Learning Center, Rutgers University**

Neuroscience Day Instructor 2013-2014

**Biotechnology Training Program, Rutgers University**

Member, Student Advisory Board 6/2012-6/2014

- Lead organizer and coordinator for annual symposium (2013 and 2014).

**UNDERGRADUATE****Club Swim Team, Princeton University**

Vice-President (1/2008-1/2009), President (1/2009-1/2011) 2008-2011

**Biomedical Engineering Society, Princeton Univ. Chapter**

Secretary and Founding Member 6/2010-1/2011

**TEACHING EXPERIENCE****Rutgers University, Biochemistry Dept., Ethical Scientific Conduct**

Guest lecturer for graduate Ethics course (50 students) 1/2016  
"History of Scientific Ethics"

**Rutgers University, Biomedical Eng. Dept., Measurements and Analysis Laboratory**

Guest lecturer and laboratory TA for undergraduate course (130 students) 3/2013  
"Electroencephalogram (EEG) – Basics and Applications"

**TRAINING AND WORKSHOPS**

Training Course, NIH Office of Intramural Training & Education Apr-May 2018  
Diversity and Inclusion in a Multicultural Society (4 hr/wk for 6 wks)

Project AGER, Rutgers University 2014-2015  
NSF-Funded Excellence in Mentorship Program (9/2014-5/2015)

MBI Workshop, Ohio State University 2014  
CTW: Axonal Transport and Neuronal Mechanics (Nov. 3-7)

Society for Neuroscience Conference, Washington, D.C. 2014  
Neurobiology of Disease Workshop: Stroke Recovery (Nov. 14)

Project AGER, Rutgers University 2013  
Mentoring Undergraduates in Laboratory Research (May 15)