

# Hannah Small

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## EDUCATION

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### University of Richmond

Richmond, VA

*Bachelor of Science in Biology (with Honors), Computer Science minor*  
*summa cum laude*

May 2018

Major GPA: 4.00, Overall: 3.94, Phi Beta Kappa

Honors thesis: *Developing an approach to investigate KATP channel's role in the ketogenic diet*

## RESEARCH EXPERIENCE

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### Technical Associate

July 2019 – present

*Dr. Evelina Fedorenko's Language Lab, MIT*

Cambridge, MA

- I lead and organize several projects understanding the representations and underlying computations that are involved in the unique human language ability, including production/comprehension, social cognition, and executive function.
- I create materials and experimental scripts for fMRI and ECoG experiments, lead data collection, process, analyze, and visualize neural data and collaborate on research directions with lab members.

### Electrophysiology Research Assistant, Beckman Scholar Fellow

May 2015 – May 2018

*Dr. Linda Boland's Electrophysiology Lab, University of Richmond*

Richmond, VA

- I developed a model to study potassium ion channel regulation of action potentials. I used *Xenopus laevis* oocytes to express sodium and potassium ion channels and stimulated action potentials with a modified two-electrode loose voltage clamp.
- I utilized this model system in my thesis research to develop a model to investigate the mechanism of action of the ketogenic diet, a diet prescribed to children with severe drug-resistant epilepsy.
- I spearheaded bringing R analysis to the lab, writing scripts for automated data analysis of electrophysiological recordings.

## TEACHING EXPERIENCE

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### Integrated Quantitative Science Review Session Tutor

August 2015 – May 2016

*University of Richmond*

Richmond, VA

- Selected as a strong student from the previous year's class to be a resource and guide to the incoming class, providing tutoring for mathematics, physics, computer science, chemistry, and biology.

## PUBLICATIONS

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Corbin, A., **Small H.**, Boland L.M. & C. Villalba-Galea (2018). A *Xenopus* oocyte model system to study action potentials. *Journal of General Physiology*.

## MANUSCRIPTS IN PROGRESS

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\*denotes equal contribution

Hu, J.\*, **Small, H.\***, H. Kean, A. Takahashi, L. Zekelman, D. Kleinman, E. Ryan, V. Ferreira & E. Fedorenko. (in-prep.) Distributed and overlapping neural mechanisms for lexical access and syntactic encoding during language production.

**Small, H.\***, Hosseini, E.\*, Siegelman, M., Brunner, P., Schalk, G., Kanwisher, N., Isik, L. & E. Fedorenko. (in-prep.) Multivariate decoding of syntactic category in the sentence but not word-list context in ECoG.

Affourtit, J., **Small, H.**, Mineroff, Z. & E. Fedorenko. (in prep.) In defense of individual-level functional neural markers.

Affourtit, J., Rakocevic, L., Tuckute, G., Mineroff, Z., **Small, H.**, Kean, H., Jouravlev, O., Ayyash, D., Pritchett, B., Siegelman, M., Pongos, A., Hoeflin, C., & E. Fedorenko. (in prep.) 800LanA: A probabilistic atlas of the human language network based on 800+ individuals.

## SCIENTIFIC PRESENTATIONS

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### Talks

**Small, H.** “Developing an approach to investigate KATP channel’s role in the ketogenic diet”, thesis presentation at the Biology Seminar, University of Richmond, April 2018

### Posters

Hu, J.\*, **Small, H.\***, Kean, H., Takahashi, A., Zekelman, L., Kleinman, D., Ryan, E., Ferreira, V., & E. Fedorenko. *Distributed and overlapping neural mechanisms for lexical access and syntactic encoding during language production*. Virtual presentation at Society for the Neurobiology of Language, October 2020

Affourtit, J., **Small, H.**, Mineroff, Z., & E. Fedorenko. *In defense of individual-level functional neural markers*. Virtual presentation at Society for the Neurobiology of Language, October 2020

**Small H.**, Corbin, A., Boland, L.M. & C. Villalba-Galea. “Using excitable oocytes to investigate the role of potassium channels in action potentials”. Society for Neuroscience, Washington D.C., November 2017

**Small H.**, Corbin, A., Boland, L.M. & C. Villalba-Galea. “Investigating the modulation of action potentials using excitable oocytes”, Beckman Conference, Irvine, CA, August 2017

**Small H.**, Corbin, A., Boland, L.M. & C. Villalba-Galea. “Differential regulation of action potentials by potassium channels”, Society for Neuroscience, San Diego, CA, November 2016

**Small H.**, Corbin, A., Boland, L.M. & C. Villalba-Galea. “Using egg-citable cells to study the impact of Kv4 channels and their modulation on action potential activity”, ASBMB Symposium, University of Richmond, October 2015

**Small H.**, Corbin, A., Boland L.M. & C. Villalba-Galea. “Egg-citable cells: Action potentials generated in frog oocytes”, HHMI Symposium, University of Richmond, September 2015

## FUNDING

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**Beckman Scholar Award** (2016-2018) ~ \$18,000 funding awarded for quality and creativity of research and potential as a researcher

**HHMI Research Student** (Summer 2015) awarded ~ \$6,000 funding for summer research investigating ion channel properties using electrophysiology

## HONORS AND AWARDS

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**Biology Senior Research Award** (May 2018), Dept. of Biology, University of Richmond, given to the senior with the most outstanding research

**Phi Beta Kappa Honor Society** (invited May 2017), Epsilon chapter, *top 1% of junior class*

**Robins Science Scholar** (May 2014) selected for excellence in science to attend University of Richmond on a full scholarship plus room and board, *awarded to 4 per year*

## PROGRAMMING LANGUAGES AND SOFTWARE

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**Languages:** Python, R, MATLAB, Java, C++

**Software:** Psychtoolbox, jsPsych

**Familiar with:** JavaScript/HTML/CSS

## OPEN SCIENCE CONTRIBUTIONS

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jsPsych (Summer 2020) developed and contributed plugins to record participant audio in online behavioral tasks

## PROFESSIONAL DEVELOPMENT

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**Currently taking:**

*Machine Learning*, Stanford coursera course, taught by Andrew Ng

**Classes I have audited:**

*Lab in Psycholinguistics*, MIT, Spring 2020

*Computational Psycholinguistics*, MIT, Spring 2020

*Deep Neural Network workshop* led by Katharina Dobbs & Kamila Jóźwik, January 2020

*Intro to Deep Learning*, MIT IAP, January 2019

*Computational Cognitive Science*, MIT, Fall 2019

**Summer Schools:**

*Brains, Minds, and Machines Summer Course (virtually)*, Summer 2020

## **VOLUNTEER EXPERIENCE**

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### **Camp Kesem at University of Richmond**

*Camp Administrator*

*Operations Co-Coordinator*

*Treasurer*

Richmond, VA

2017 & 2018

2016 – 2018

2015 – 2016

- I co-organized, planned, and implemented a week-long sleep-away summer camp provided at no cost to children whose families have been affected by cancer.
- I created and operated a \$70,000 budget to provide creative activities to support this unique population.

### **Women in Math and Science Mentoring Group**

Co-Founder and Co-Leader

Richmond, VA

2017 – 2018

### **LZone**

English tutor for native Korean speakers

Busan, South Korea

Summer 2017

### **CIEE Study Abroad Newsletter**

Co-Editor of student-run newsletter

Hyderabad, India

Spring 2017

### **Overby-Sheppard Elementary School and YouthLife**

**Foundation of Richmond**

Elementary School Reading Tutor for 3<sup>rd</sup> grade and kindergarten students

Richmond, VA

2015-2016