

# Caroline Cypranowska

Postdoc, Dept. of Molecular & Cell Biology, University of California, Berkeley

Isacoff Lab, 279 Weill Hall #3200, Berkeley, CA 94720

[casegura@berkeley.edu](mailto:casegura@berkeley.edu) | [LinkedIn](#) | [cypranowska.github.io](https://cypranowska.github.io)

**Expertise:** data analysis, functional genomics, neuroscience, biophysics, image processing

**Computational tools:** R/Rstudio, Python, Bash, MATLAB, Git, Adobe Illustrator, Julia

**Laboratory techniques:** single-cell RNA-seq, fluorescence-activated cell sorting (FACS), immunohistochemistry (IHC), confocal microscopy, fruit fly culture, protein purification, single-molecule imaging, TIRF microscopy

## Selected Research Experience

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Graduate Student Researcher (UC Berkeley, Advisor: Ehud Isacoff, Mar 2015 - May 2020)

Functional transcriptomics of larval *Drosophila melanogaster* motor neurons

- Investigating functional diversity of neuron populations in the ventral nerve cord of fruit fly larvae using single-cell RNA-sequencing and low-input RNA-sequencing
- Using unsupervised machine learning methods in high-performance computing environments to identify different populations of motor neurons
- Interpreting models to identify genes involved in how neurons maintain and modify the strength of their synaptic connections
- Maintaining group environments tailored for lab-specific projects on high-performance computing resources

Graduate Student Researcher (UC Berkeley, Advisor: Ahmet Yildiz, June 2013 - Jan 2015)

Role of the AAA3 ATPase subunit in the motility of cytoplasmic dynein

- Investigated the mechanism by which the AAA3 ATPase regulates motility and pausing behavior of dynein for the transport of cellular cargoes using single-molecule TIRF microscopy and single-molecule inhibition assays
- Developed a two-state model to describe how the AAA3 subunit acts as a gate to facilitate rapid motility
- Culminated in second author publication in *Nature Structural & Molecular Biology*

Undergraduate Researcher (UC Berkeley, Advisor: Ehud Isacoff, Jan 2012 - May 2013)

Cooperativity in a voltage-gated proton channel, CiVSP

- Used electrophysiology and mutagenesis to map the interface controlling cooperativity between the two subunits of the CiVSP homodimer

## Education

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University of California, Berkeley; 2013 - 2020

PhD in Molecular & Cell Biology

University of California, Berkeley; 2009 - 2013

BA in Molecular & Cell Biology, Emphasis in Neurobiology

## Publications, Posters, and Presentations

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- **Cypranowska, C.A.**, Yildiz, A., Ishikawa, T. Dyneins. *Encyclopedia of Cell Biology*, 2016; 620-636.
- Dewitt, M.A., **Cypranowska, C.A.**, Cleary, F.B., Belyy, V., Yildiz, A. The AAA3 domain of cytoplasmic dynein acts as a switch to facilitate microtubule release. *Nat Struct Mol Biol*, 2015; 22(1): 73-80.
- Dewitt, M.A., **Cypranowska, C.A.**, Cleary, F.B., Belyy, V., Yildiz, A. The AAA3 domain of cytoplasmic dynein acts as a switch to facilitate microtubule release. Paper presented at: MCB Joint Retreat; 2015 Jan 11-13; Asilomar, CA.
- Dewitt, M.A., **Cypranowska, C.A.**, Lawrence, R.E., Yildiz, A. Single-molecule study of the communication between the two primary sites of cytoplasmic dynein. Poster session presented at: 58th Biophysical Society Meeting; 2014 Feb 15-19; San Francisco, CA.

## Awards

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- National Science Foundation Graduate Research Fellowship (2015 - 2020)

## Teaching

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- Neurobiology of Disease - UC Berkeley, Spring 2017 - *Graduate Student Instructor*
- Elementary Algebra - Prison University Project at San Quentin, Fall 2015 - *Instructor*
- Biophysical Chemistry - UC Berkeley, Fall 2014 - *Graduate Student Instructor*
- Elementary Algebra - Prison University Project at San Quentin, Summer 2014 - *Instructor*

## Selected Activities

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UC Berkeley Single Cell User Group (Summer 2018 - Fall 2019)

- Facilitated monthly discussions between graduate students and postdocs across labs using single-cell RNA-sequencing for their projects
- Consulted on single-cell RNA-sequencing projects in other labs in MCB

Software Carpentries/Data Carpentries, Instructor (Summer 2018)

- Led hands-on training of a diverse group of graduate students and postdocs in Git, Shell and R ([bids.github.io/2018-06-11-bids/](https://bids.github.io/2018-06-11-bids/)) and genomics data analysis ([bids.github.io/2018-08-06-bids/](https://bids.github.io/2018-08-06-bids/))

The Hacker Within/Data Analysis Tool Series, Organizer (March 2018 - December 2018; [bids.github.io/dats/](https://bids.github.io/dats/))

- Lead workshops on analytical and visualization tools, such as matplotlib and D3.js
- Organizing speakers and providing communications copy for events

Graduate Affairs Committee, Dept. of Molecular & Cell Biology (August 2017 - May 2019)

- Conducted surveys of graduate student body for the purpose of improving pedagogical training throughout the doctoral program
- Formed a departmental wellness committee to improve cohesion between faculty, staff, students, and postdoctoral researchers

**Caroline Cypranowska**, PhD, Molecular & Cell Biology, UC Berkeley

Prison University Project, Dept. of Mathematics, San Quentin State Prison (May 2014 - Dec 2015)

- Led courses in mathematics with the Prison University Program, a AA-degree awarding program operating within San Quentin State Prison