# Katherine Amberg-Johnson | Molecular and Cellular Biologist | Data Scientist

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## RESEARCH EXPERIENCE

**Inzen Therapeutics** Sept 2018- present
*Scientist* New York, NY

- Uses both experimental and computational approaches to understand how different cell death mechanisms drive fibrotic diseases

**Stanford University,** Advisor: Ellen Yeh Sept 2013-August 2018
*Bio-X Fellow Ph.D. Student, Departments of Microbiology & Biochemistry* Palo Alto, CA

- Chemical and Cell Biology:
  - Pioneered a **phenotypic drug-screening pipeline** involving FACs-based conditional dose-dependent drug assays, qPCR, and microscopy to identify and characterize novel antimalarial compounds targeting apicoplast biogenesis.
  - Optimized a **fluorescence drug-screening assay** involving an automated microplate-reader to quantify dose-dependent cell-death kinetics in *T. gondii.*
  - Utilized **CRISPR/Cas9 genome editing** to validate drug targets in *P. falciparum* and *T. gondii.*
- Computational Analysis:
  - Analyzed **whole-genome sequencing data** using Python to identify anti-parasitic drug targets from multiple independently selected resistant *T. gondii* strains.
  - Developed a Python-based platform for **automatic queries** of the parasite online databases.
- Collaborations:
  - Coordinated collaboration with enzymologists at MIT to establish **high-throughput *in vitro* drug assays** for inhibition of enzymatic activity.
  - Pioneered and optimized **live video microscopy** experiments of *T. gondii* to study defects in division in collaboration with *T. gondii* geneticists.
- Leadership and Teaching:
  - Directly **mentored three 1st year Ph.D. students and one undergraduate researcher** on diverse projects including synthetic biology, super-resolution microscopy, protein immunoprecipitation, and gene expression profiling.
  - Provided both **instrument training and technical support for 70+ flow cytometry users**. Aided users with experimental design and data analysis.
  - Taught ***Techniques in Biotechnology*** and ***Innate Immunology*** to graduate students.

**Insight Data Science** Jan 2018-present
*Fellow* New York City, NY
Summary: www.kambergjohnson.com/projects/beach-water-contamination

- Developed *Contamination in Paradise*—a **python-based model** to predict bacterial contamination in Hawaiian beach water that could lessen the workload of the Hawaii Department of Health by 1/3rd.
- Implemented a boosted decision tree **machine-learning algorithm** including features engineered from time-series weather data to predict contamination events from severely imbalanced historical contamination data.
- Communicated a **dashboard visualization** of time series bacterial contamination using Tableau.
- **Identified possible subtypes** of contamination events for further analysis.

**Hume Center for Writing and Speaking** Jan 2017-present
*Oral Communications Tutor* Palo Alto, CA

- Fostered **supportive communication** through one-on-one mentoring to students at all stages of the oral presentation process (presenting a diversity of subjects including math, liberal arts, and science).

**University of California, Berkeley**, Advisor: David Wemmer July 2010-May 2013
*Undergraduate Researcher* Berkeley, CA

- Performed **NMR spectroscopy** and **optical tweezers** experiments to understand the structure and function of the bacterial transcriptional regulatory factor, σ54.

## SKILLS

**Languages**: Python, SQL
**Tools**: Tableau, Scikit-Learn, Pandas, MatplotLib, BeautifulSoup, Illustrator, PyMOL, GraphPad Prism
**Wet Lab:** Drug screening/characterization, SAR analysis, Western blotting, SDS-PAGE, Mammalian cell culture-primary cells, Transfection-stable, microplate-based assays, FACs cell sorting and analysis, Microscopy-live and fix immunofluorescence, CRISPR/Cas9 genome editing-knockouts and knock-ins, Molecular cloning—digest and recombination, PCR, qPCR, dPCR, ELISA, Protein expression and purification

## PUBLICATIONS

- Tang, Y., Meister, T.R., Walczak, M., Pulkoski-Gross, M., Hari, S.B., Sauer, R.T., **Amberg-Johnson, K.,** Yeh, E. A mutagenesis screen for essential plastid biogenesis genes in human malaria parasites. *Plos Biol*. (2019)
- **Amberg-Johnson, K.** Yeh, E. Host cell metabolism contributes to delayed-death kinetics of apicoplast inhibitors in Toxoplasma gondii. *Antimicrobial Agents and Chemotherapy.* (2018).
- Foe, IT., Onguka, O., **Amberg-Johnson, K.**, Garner, R., Amara, N., Beatty, W., Yeh, E., Bogyo, M. The *Toxoplasma gondii* Active Serine Hydrolase 4 regulates parasite division and intravacuolar parasite architecture*. mSphere.* (2018).
- **Amberg-Johnson, K**., Hari, S.B., Ganesan, S.M., Lorenzi, H.A., Sauer, R.T., Niles, J.C., Yeh, E. Small molecule inhibition of apicomplexan FtsH1 disrupts plastid biogenesis in human pathogens. *eLife.* (2017).

## EDUCATION

**Stanford University**
Ph.D. in Microbiology and Immunology
August 2018

**University of California, Berkeley**
B.Sc. in Microbial Biology, with honors
August 2009-May 2013

## AWARDS AND HONORS

| | |
|---|---|
| 2018 | Insight Data Science Fellowship |
| 2016-2019 | Bio-X Stanford Interdisciplinary Graduate Fellowship (Stanford University) |
| 2016 | Two-Photon and Super-Resolution Microscopy Pilot Grant (Stanford University) |
| 2015, 2016 | Biosciences Office of Graduate Education Travel Grant (Stanford University) |
| 2013-2016 | Cellular and Molecular Biology Training Grant (Stanford University) |
| 2012 | Amgen Scholars Program (UC Berkeley) |
| 2012-2013 | Barry Goldwater Scholarship (UC Berkeley) |
| 2011 | Science Undergraduate Laboratory Internship (LBNL) |
| 2009-2010 | Leadership Award (UC Berkeley) |

## PRESENTATIONS

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| 2017 | Toxo-14 Meeting (Oral Presentation, Portugal) |
| 2017 | Bay Area Microbial Pathogenesis (Oral Presentation, UCSF) |
| 2016 | Biochemistry Postdoc Seminar (Oral Presentation, Stanford) |
| 2016 | Microbiology and Immunology Retreat Seminar (Oral Presentation, Stanford) |
| 2015, 2016 | Molecular Parasitology Meeting (Poster Presentation, Woods Hole) |
| 2015 | Bay Area Meeting on Organelle Biology (Oral Presentation, UCSF) |
| 2013 | Undergraduate Honors Thesis Research Symposium. (Oral Presentation, UC Berkeley) |
| 2012 | Amgen Symposium (Oral Presentation, UC Berkeley) |