Katherine Amberg-Johnson | Drug Hunter | Molecular and Cellular Biologist |

katieambergjohnson@gmail.com • 808-428-9703 •
kambergjohnson.com • linkedin.com/in/katieambergjohnson • github.com/kambergjohnson •

SUMMARY

An interdisciplinary and innovative scientist combining both wet-lab expertise with computational skills. A team-oriented drug discovery biologist with experience contributing in cross-functional teams. Broad interests with projects spanning oncology, liver disease, and infectious disease.

EDUCATION

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

University of California, Berkeley
B.S. in Microbial Biology, with honors
May 2013

RESEARCH EXPERIENCE

Schrödinger June 2020-present
Senior Scientist, Drug Discovery Group New York, NY

- Drug Discovery Program Execution
  - Collaborate with computational chemists, medicinal chemists, and experimentalists to develop and execute preclinical drug screening programs designed to assess potency, selectivity, efficacy, and safety of our compounds.
  - Co-lead *in vitro* pharmacology programs designed at exploring drug mechanism-of-action, rationale drug combinations/synergy, and differentiation from standard treatments.
  - Establish collaborations with CROs and academic laboratories and communicate progress across the Schrödinger team to drive our programs towards transformative therapies.
- New Target Identification
  - Propose and analyze new drug targets for their biological rationale and tractability to identify new opportunities for Schrödinger's drug pipeline spanning multiple diseases areas with a sharp focus on areas of unmet medical need.
  - Remain up-to-date on literature, conference presentations, and clinical trial data to recognize opportunities where Schrödinger's technological platform could improve upon current treatments.

Inzen Therapeutics September 2018-May 2020
Scientist New York, NY

- Assay Development:
  - Developed complex cell-culture systems to screen for cell stressors that induce liver cells to secrete molecules that regulate **inflammation, fibrosis, and compensatory proliferation**.
  - Optimized a cell-culture system to model the pathological inflammation of **Non-Alcoholic Steatohepatitis (NASH)** livers.
- Target Identification and Validation:
  - Employed **chemical biology tools** to uncover underlying molecular signaling that leads to the release of pro-inflammatory cytokines in a cell-culture model of NASH.

    - **Identified the specific pro-inflammatory mediator** required for monocyte activation in a cell-culture model of NASH by leveraging RNA sequencing data to identify candidate factors and validating candidates using specific inhibitors and antibody neutralization.
    - Performed **siRNA screens** to discover novel mediators of lung fibrosis.
    - Generated stable knockout cell lines using **CRISPR/Cas9 genome editing** to validate candidate drug targets in cancer mouse models.
- Computational Analysis:
    - Developed **four distinct analysis pipelines** using Python to elect candidate active molecules by integrating proteomics datasets with biochemical activity data.
    - Evaluated the accuracy of our computational analysis pipelines using **statistical resampling methods** (bootstrapping).
- External *In Vivo* Collaborations:
    - Led a collaboration with a contract research organization (CRO) to study mouse serum proteins released in various **mouse models of acute liver failure**.
    - Led a collaboration with a CRO to study the growth of tumor cells with knockouts in candidate drug targets in a **mouse model of B-cell lymphoma.**
- Extracurricular:
    - Helped team transition to an **electronic notebook platform** for documenting experiments and sample tracking.
    - Led a committee to organize **team events, community outreach, and journal club.**

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 January 2018-April 2018

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.

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

Programming Languages: Python, SQL

Tools: Pandas, Scikit-Learn, MatplotLib, BeautifulSoup, Illustrator, PyMOL, GraphPad Prism, Tableau

Wet Lab: Mammalian cell culture-cell lines and primary cells, ELISA, antibody neutralization, siRNA screening, Lentivirus transfections, Drug screening/characterization, SAR analysis, Western blotting, SDS-PAGE, Electroporation transfection, 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, 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).

AWARDS AND HONORS

2019	Inzen Values Award: Passion for Science
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

2018 Stanford University Thesis Presentation (Oral Presentation, Stanford)
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)

EXTRACURRICULAR

American Museum of Natural History May 2019-present
Discovery Room Volunteer New York, NY

- Facilitate **hands-on-science learning** for children of all ages. Activities include scavenger hunts for animal specimen, assembling a life-size cast skeleton of a Triassic crocodile, exploring microbial diversity through microscopy of pond scum, and tracking real-time earthquakes with a digital seismographic display.

Hume Center for Writing and Speaking January 2017-August 2018
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).