

# JOSHUA COOK

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## Programming Languages

Python

R

Rust

Swift

## Skills

Software development  
(applications and libraries)

Bioinformatics

Spatial transcriptomics

Bayesian statistics & modeling

Machine Learning

Data analysis & visualization

Git version control

iOS, watchOS, macOS

application development

Microcontroller engineering

and programming

## Hobbies

Backpacking & camping

Long distance & trail running

Fishing

Reading

## PROFILE

Results-driven software developer and data analyst with 7+ years of experience and a strong interdisciplinary foundation in molecular biology, biochemistry, chemistry, and computational biology. Proficient in analyzing bulk and single-cell 'omics data to accelerate exploratory research, early discovery, and late-stage pre-clinical programs. Experienced team leader with a track record of developing robust data processing pipelines, analysis workflows, and innovative internal software tools. Passionate about machine learning, with a particular focus on Bayesian modeling and interpretation.

## EXPERIENCE

### Computational Genomics Research Scientist | Vertex Pharmaceuticals

2022–Present

- Analyzed human genetic variability in multiple diseases including Duchenne muscular dystrophy (DMD) and sickle cell disease, contributing to the advancement of exa-cel (Casgevy) through multiple regulatory phases and to market in the USA and Europe.
- Lead onboarding of novel spatial transcriptomics technologies for the Type I Diabetes cell therapy program by constructing best practice guidelines and pipelines for data processing, execution of cell type deconvolution ML models, and statistical analyses.
- Developed workflows to standardize and streamline analyses of AAV integration for a CRISPR-based DMD gene therapy.
- Continual literature research to identify novel methods and technologies to advance our research programs.

### Ph.D. Candidate in Computational Biology | Harvard University

2017–2022

- Statistical analysis of large genomic and transcriptomic datasets to identify novel patterns and potential vulnerabilities in *KRAS*-mutant cancers.
- Developed and fit hierarchical Bayesian models to extract insights from large, complex, high-dimensional genomic datasets and CRISPR/Cas9 knock-out screens.
- Constructed efficient and reproducible pipelines to streamline data-processing for lab members.
- Presented my findings to audiences of diverse backgrounds and expertise.

### Research Assistant | UC Irvine

2014–2017

- Dissected the molecular processes by which *Toxoplasma gondii* alters the adhesion and mobility machinery in infected white blood cells.
- Performed live-cell confocal microscopy and developed an semi-automated pipeline for the quantification of focal adhesion formation in *T. gondii*-infected human monocytes.

### Tutor & Tutor Advisor | UC Irvine Learning and Academic Resource Center

2015–2017

- Regularly met with tutors to assist them with successfully managing their own course load, personal lives, and tutoring responsibilities.
- Advocated on behalf of the tutors in conversations with school administrators.
- Maintained the smooth operations of LARC tutoring services by scheduling tutorial sessions and addressing day-to-day problems.

2014

- Performed qPCR and neuronal imaging on samples from multiple brain regions of genetically engineered mice to quantify the spatial composition of axon-guidance machinery under different developmental conditions.

## **EDUCATION**

(2017–2022) **Harvard University** — Ph.D. in Computational Biology

(2013–2017) **UC Irvine** — B.S. in Biochemistry & Molecular Biology (Honors); B.S. in Chemistry (Honors)

## **PUBLICATIONS**

**Joshua H. Cook**. 2022. “Studying the tissue-specificity of cancer driver genes through *KRAS* and genetic dependency screens.” Ph.D. Dissertation. Harvard University.

Minh V. Huynh, G. Aaron Hobbs, ..., **Joshua H. Cook**, ..., Kevin M. Haigis, ..., Channing J. Der. 2022. “Functional and biological heterogeneity of *KRAS*Q61 mutations.” *Science Signaling*. PMID 35944066.

**Joshua H. Cook**, Giorgio E. M. Melloni, Doga C. Gulhan, Peter J. Park, and Kevin M. Haigis. 2021. “The origins and genetic interactions of *KRAS* mutations are allele- and tissue-specific.” *Nature Communications*. PMID 33753749.

Emily J. Poulin, Asim K. Bera, ..., **Joshua H. Cook**, ..., Douglas A. Lauffenburger, Kenneth D. Westover, Kevin M. Haigis. 2019. “Tissue-specific oncogenic activity of *KRASA*146T.” *Cancer Discovery*. PMID 30952657.

**Joshua H. Cook**, Norikiyo Ueno, and Melissa B. Lodoen. 2018. “*Toxoplasma gondii* disrupts  $\beta$ 1 integrin signaling and focal adhesion formation during monocyte hypermotility.” *The Journal of Biological Chemistry*. PMID 29295815.

Maillard, Julien, Soyoung Park, Sophie Croizier, Charlotte Vanacker, **Joshua H. Cook**, Vincent Prevot, Maithe Tauber, and Sebastien G. Bouret. 2016. “Loss of *Magel2* impairs the development of hypothalamic anorexigenic circuits.” *Human Molecular Genetics*. PMID 27288456.

## **AWARDS**

### **Vertex Outstanding Contribution Award Program**

2024: Team Silver award, Individual Bronze award

2023: Team Silver award, Individual Silver award, 3x Team Bronze awards, Individual Bronze award

### **NSF Graduate Research Fellowship Program Honorable Mention**

### **UC Irvine Honors in Biological Sciences**

### **Phi Lambda Upsilon National Honorary Chemical Society**

American Chemical Society Polymer Education Award

Jayne Unzelman Scholarship

### **UC Irvine Chancellor’s Award of Distinction**

### **Phi Beta Kappa Society**

### **Fulbright Fellowship Alternate**

Malcolm R. Stacey Memorial Scholarship

### **UCI Alumni Association 2016-17 Distinguished Anteaters<sup>1</sup> Award**

UCI School of Bio Sci Brian Atwood Scholarship

Robert Ernst Prize for Excellence in Research in the Biological Sciences

### **Barry Goldwater Scholar**

UCI Dean’s Honor List

All 12 academic quarters

UCI Campuswide Honors Program

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<sup>1</sup> The anteater is the UC Irvine mascot.