

# 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

Data analyst and software developer with 7+ years of experience and a strong interdisciplinary foundation in genetics, 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 written in Python, R, and Rust. Passionate about machine learning, with a particular focus on Bayesian modeling and interpretation.

## EDUCATION

**Harvard Medical School** 2017-2022

Ph.D. in Computational Biology

**UC Irvine** 2013-2017

B.S. in Biochemistry & Molecular Biology (*magna cum laude*)

B.S. in Chemistry (*magna cum laude*)

## EXPERIENCE

### Vertex Pharmaceuticals

Computational Genomics Senior Research Scientist 2025 – Present

Computational Genomics Research Scientist 2022 – 2024

- 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 Python- and Rust-based 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.

### Harvard Medical School, DFCI

Ph.D. Candidate in Computational Biology 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 in Python and R to streamline data-processing for lab members.
- Presented my findings to audiences of diverse backgrounds and expertise.

### UC Irvine

Research Assistant 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 a semi-automated pipeline for the quantification of focal adhesion formation in *T. gondii*-infected human monocytes.

## UC Irvine Learning and Academic Resource Center

Tutor & Tutor Advisor 2015–2017

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

## Saban Research Institute, Children's Hospital Los Angeles

Research Assistant 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.

## 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

2025: Team Silver, Individual Silver

2024: Team Silver, Individual Bronze

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

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.