JOSHUA COOK

Graduent Student Researcher

As an undergrad, I studied the parasite *Toxoplasma gondii*, and I currently study cancer genetics using bioinformatics with a specific focus on Bayesian methods. I am looking to once again switch disciplines but continue utilizing and improving my Bayesian statistical analysis skills.

EDUCATION

present | 2017
Harvard Medical School
Biomedical and Biological Sciences PhD. program — Boston, MA
Studying cancer genetics with bioinformatics and statistical modeling.

2017 | 2013
University of California, Irvine
B.S. in Biochemistry and Molecular Biology & B.S. in Chemistry — Irvine, CA
Magna Cum Laude with a cumulative GPA of 3.94 and Honors in Biology.

RESEARCH EXPERIENCE

present | 2017
Graduate Research
Harvard Medical School — Boston, MA
My first project was to study the tissue- and allele-specific genetic interactions of *KRAS* in cancer using thousands of human tumor samples. Currently, I am analyzing CRISPR-Cas9 loss-of-function screens using Bayesian hierarchical models.

2017 | 2014
Undergraduate Research
Dept. of Molecular Biology and Biochemistry, UCI — Irvine, CA
I investigated the patterns and mechanisms of dissemination by which *Toxoplasma gondii*, an obligate, intracellular parasite, infects a human host.

2014
Research Interneship
Saban Research Institute, Los Angeles — Los Angeles, CA
I studied the underlying causes of developmental disruptions within the hypothalamus that are characteristic of Prader-Willi syndrome.

2012
Research Interneship
Saban Research Institute, Los Angeles — Los Angeles, CA
I researched the role of liver progenitor cells in Alagille syndrome and biliary atresia, two rare, yet deadly, early-onset liver diseases.

PUBLICATIONS

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

CONTACT INFO

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SKILLS

- Bayesian statistical modelling
- Data visualization
- iOS, macOS, and watchOS app development

PROGRAMMING LANGUAGES

- R
- Python
- Swift
- Bash

Download this CV as a PDF.

(Still need to add a link to the actual file...)

2019 **Tissue-Specific Oncogenic Activity of *KRAS*A146T**
Cancer Discov.
Emily J Poulin, Asim K Bera, Jia Lu, Yi-Jang Lin, Samantha Dale Strasser, Joao A Paulo, Tannie Q Huang, Carolina Morales, Wei Yan, **Joshua Cook**, Jonathan A Nowak, Douglas K Brubaker, Brian A Joughin, Christian W Johnson, Rebecca A DeStefanis, Phaedra C Ghazi, Sudershan Gondi, Thomas E Wales, Roxana E Iacob, Lana Bogdanova, Jessica J Gierut, Yina Li, John R Engen, Pedro A Perez-Mancera, Benjamin S Braun, Steven P Gygi, Douglas A Lauffenburger, Kenneth D Westover, Kevin M Haigis

2018 **_Toxoplasma gondii_ disrupts β1 integrin signaling and focal adhesion formation during monocyte hypermotility**
J. Biol. Chem.
Joshua H Cook, Norikiyo Ueno, Melissa B Lodoen

2016 **Loss of Magel2 impairs the development of hypothalamic Anorexigenic circuits**
Hum. Mol. Genet.
Julien Maillard, Soyoung Park, Sophie Croizier, Charlotte Vanacker, **Joshua H Cook**, Vincent Prevot, Maithe Tauber, Sebastien G Bouret

SOFTWARE

- **ggasym**
  Plotting asymmetric heatmaps in `R`.
- **mustashe**
  Caching and restoring the results of long-running computations in `R`.
- **boston311**
  `Python` package for querying Boston's 311 non-emergency reporting service.
- **textrank**
  `Swift` package for using the PageRank algorithm for text summarization.
- **Germinate**
  An `iOS app` for tracking seedling germination rates.
- **WaterMe**
  An `iOS app` for recording and scheduling when to water plants.
- **Plant Tracker**
  An `iOS app` for keeping track of a plant collection.
- **Workout Spinner**
  An `Apple Watch` app for randomly selecting an exercise.
- **Telemetry Recorder**
  An `Apple Watch` app that records the watches acceleromter and gyroscope values and saves them a CSV in iCloud.
- **Brief**
  A `macOS` app for summarizing text.

PRESENTATIONS

Sept 2021 Cancer Research UK Trainee Meeting (oral): Modeling CRISPR-Cas9 screens to identify tissue-specific patterns.

Bayesian data analysis portfolio

Here is a collection of Bayesian data analyses I have done for my graduate research and personal projects.

Data visualization examples

You can peruse some of my data visualizations and analyses in my `TidyTuesday` repository.

For BMI 707 *Deep Learning for Biomedical Data*, my group trained a Generative Adversarial Network to produce high-resolution, realistic hand X-rays and then analyzed the latent space to control the age of the generated hand.

Examine the result in our report and watch this video of us controlling the GAN to make aging hand radiographs.

May 2021 — Harvard Medical School Cancer Signaling Meeting (oral): Tissue- and allele-specific genetic interactions of *KRAS*.

Mar 2020 — Brigham and Women's Hospital, Genetics Research in Progress (oral): The genetic interaction network of mutationally activated *KRAS*.

Oct 2019 — Cancer Research UK Progress Meeting (oral): Genetic description of oncogenic *KRAS* mutations.

May 2016 — UCI Undergraduate Research Opportunities Program Symposium (poster): *Toxoplasma gondii*-induced hypermotility in human primary monocytes through the dysregulation of β1 integrins.

Apr 2016 — UCI Excellence in Research (poster): *Toxoplasma gondii*-induced hypermotility in human primary monocytes through the dysregulation of β1 integrins.

Apr 2016 — UCI Excellence in Research (oral): *Toxoplasma gondii*-induced hypermotility in human primary monocytes through the dysregulation of β1 integrins.

Apr 2016 — West Coast Biological Sciences Undergraduate Research Conference (oral): Hypermotility of human primary monocytes through the dysregulation of β1 integrins by *Toxoplasma gondii*.

May 2015 — UCI Undergraduate Research Opportunities Program Symposium (oral): Destabilization of cell adhesion in human monocytes infected with *Toxoplasma gondii*.

TEACHING EXPERIENCE

Sept 2018 | June 2021

Private Tutoring

Cambridge, MA

- Tutored a high school student every evening in a variety of topics
- Ensured that assignments were completed and submitted in time

Aug 2019 | Nov 2019

Teaching Assistant for BMI 713 *Computing Skills for Biomedical Sciences*

Department of Biomedical Informatics, Harvard Medical School — Boston, MA

- Assisted with instruction during lectures and helped students during periods of interactive group work
- Held weekly office hours and occasionally 1-on-1 tutoring sessions
- Created and graded problem sets

Aug 2015 | Sept 2016

Tutor

UCI Learning and Academic Resource Center — Irvine, CA

- Organized and led group tutoring sessions for undergraduate students
- Tutored for courses in introductory biology, biochemistry, molecular biology, and calculus

LEADERSHIP AND MENTORING

Feb 2016 | June 2016, Jan 2017

Irvine Little League Manager
Little League Baseball — Irvine, CA

- Co-managed a Majors division (11-12 year-olds) baseball team
- Co-managed the 11 year-old's All Star Team over the summer
- Managed my own team in the AA division (8-10 year-olds); season champions and won the Irvine City Championship Tournament
- Attended league meetings, organized parent volunteers, and scheduled practices and games

Mar 2016 | June 2017

Tutor Advisor
UCI Learning and Academic Resource Center (LARC) — Irvine, CA

- Trained other LARC tutors
- Met with tutors to make sure they were managing their course load and job in an efficient and healthy manner
- Scheduled LARC tutorials and handled day-to-day problems

Aug 2016 | June 2017

Peer Mentor
UCI Campuswide Honors Program — Irvine, CA

- Assisted and supported four incoming UC Irvine freshman
- Notified them of useful resources, answered questions they had about classes, and helped them work through the stress of beginning their undergraduate studies

Sept 2016 | Jan 2017

Peer Scholars Mentor
Scholarship and Opportunities Program — Irvine, CA

- Helped three UCI students apply for the Barry Goldwater Scholarship

HONORS AND AWARDS

Apr 2019 — NSF Graduate Research Fellowship Program Honorable Mention

June 2017 — Honors in Biological Sciences

May 2017 — Phi Lambda Upsilon

A national chemistry honorary society into which a few select graduating chemistry students are invited.

May 2017 — American Chemical Society Polymer Education Award

May 2017 — Jayne Unzelman Scholarship ($3,000)

Undergraduate student, academic excellence and service to the School of Biological Sciences and/or the University, and service to the community.

May 2017 — UC Irvine Chancellor's Award of Distinction

May 2017 — Phi Beta Kappa

Mar 2017 — Fulbright Fellowship Alternate

Jan 2017 — Undergraduate Research Opportunities Program (UROP) Fellow and Grant Recipient ($400)

Oct 2016 — Malcolm R. Stacey Memorial Scholarship ($500)

Awarded to meritorious students of Jewish descent with financial need.

June 2016 — UCI Alumni Association 2016-17 Distinguished Anteaters Award ($1,500)

The anteater is the UCI mascot.

June 2016 — Summer Undergraduate Research Program ($1,300)

May 2016 — UCI School of Bio Sci Brian Atwood Scholarship ($3,000)

Awarded to a Junior-level Biological Sciences major who has demonstrated outstanding achievement in both scholarship and service to the UCI community.

May 2016 — Robert Ernst Prize for Excellence in Research in the Biological Sciences ($250)

Apr 2016 — Excellence in Research

A UCI School of Biological Sciences undergraduate competition whereby each student submits a manuscript of their research project, gives an oral presentation, and holds a poster session.

Mar 2016 — Barry Goldwater Scholar ($7,500)

Jan 2016 — UROP Fellow and Grant Recipient ($500)

June 2015 — UROP Honorary Fellowship

Jan — 2015 UROP Fellow and Grant Recipient ($500)

2017 | 2014 — UCI Dean’s Honor List (all 12 academic quarters)

2017 | 2014 — UCI Campuswide Honors Program