

Jacob C. Kimmel
San Francisco, CA
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Education

Ph.D. — Developmental & Stem Cell Biology, UC San Francisco, 2015 - Present

Funding: NSF Graduate Fellowship, PhRMA Informatics Fellowship, NIH T32

GPA: 4.0 / 4.0

B.S. — Biotechnology, University of Central Florida, 2012 - 2015

Distinctions: Summa Cum Laude, Top Honors, University Honors

GPA: 4.0 / 4.0

Marine Biological Laboratory, Woods Hole, MA, 2016

Course: Computational Image Analysis in Cell and Developmental Biology

Research Experience

University of California San Francisco, San Francisco, CA, 2015 - Present

PhD Candidate

Principal Investigators: Andrew Brack & Wallace Marshall

Thesis: Inferring stem cell state from cell behavior

- Developed software tools to infer cell state from motility behaviors
- Quantified state transition rates during muscle stem cell activation based on timelapse image data
- Developed tools to apply deep convolutional neural networks to the analysis of cell motility
- Developing an image based classification method for muscle stem cell subpopulation states

University of Central Florida, Orlando, FL, 2011 - 2015

Research and Mentoring Program Scholar, Burnett Research Scholar

Principal Investigator: Kiminobu Sugaya, PhD

- Characterized induced pluripotent reprogramming in mesenchymal stem cells using machine-learning based image analysis, investigated cell sorting applications
- Examined the use of polarized optical torques to guide cell motility in collaboration with U. of Central Florida's optics research center
- Investigated a pathway for producing neuronal cells from adipose derived stem cells by modulation of Nanog. Published as a first-author paper, presented at Neuroscience 2013.

University of California San Francisco, San Francisco, CA, 2014 Summer

Summer Research and Training Program, Amgen Scholar

Principal Investigator: K. Mark Ansel, PhD

- Investigated the role of microRNA-29 in the regulation of cytokine production in T-cells
- Awarded the summer program's competitive Outstanding Presentation Award

National Institute on Aging, Baltimore, MD, 2012 Summer

Summer Fellow, Image Informatics and Computational Biology Unit

Principal Investigator: Ilya G. Goldberg, PhD

- Identified differential aging rates across the anatomy of *C. elegans* using machine learning based image classification
- Investigated the relationship between cognitive and age related morphologies in the primate hippocampus

Computational Skills

- Python, Matlab, R
- Deep learning with convolutional neural networks
- Quantitative imaging, multivariate data analysis, machine learning
- Object-oriented programming, VCS (git/svn), Test Driven Development

Publications

1. **Kimmel, J.C.**, A.S. Brack, and W.F. Marshall. 2017. Deep convolutional neural networks allow analysis of cell motility during stem cell differentiation and neoplastic transformation. bioRxiv. doi: <https://doi.org/10.1101/159202>. (*Submitted for publication*).
2. Constant C, **Kimmel J**, Sugaya K, Dogariu A. Optically Controlled Subcellular Diffusion. Frontiers in Optics & Laser Science. 2015.
3. **Kimmel J**, Sugaya K. Nanog Overexpression Increases Neural Marker Expression in Adipose Derived Stem Cells. Recent Patents in Regenerative Medicine. 2014;4(1):69-74.

Presentations

1. **Kimmel J**, Chang A, Brack AS, Marshall WF. Inferring cell state from cell motility behavior. Selected oral presentation to the NSF Quantitative Cell Biology Network Workshop. Allen Institute for Cell Science, Seattle, WA. 2016.
2. **Kimmel J**, Willenberg BJ, Brown A, Sugaya K. Delivery of TGF-beta signaling factors by capillary alginate gel. U. of Central Florida, Showcase of Research Excellence. 2015.
3. **Kimmel J**, Kageyama R, Steiner D, Ansel KM. miR-29 Regulation of TNF-alpha production in T cells. University of California, San Francisco. 2014.
4. **Kimmel J**, Yuan B, Constant C, Dogariu D, Foroosh H, Sugaya K. Characterization of induced pluripotent reprogramming in mesenchymal stem cells by quantitative image analysis. U. of Central Florida, Showcase of Research Excellence. 2014.
5. **Kimmel J**, Sugaya K. Nanog overexpression improves neural transdifferentiation in adipose derived stem cells. Neuroscience 2013, San Diego, CA. 2013.
6. **Kimmel J**, Eckley DM, Colleta C, Long J, Orlov N, Rapp P, Goldberg IG. Do different tissues age at different rates?. National Institute on Aging, Baltimore, MD. 2012.

Outreach

Science Education Partnership, UCSF/SFUSD, 2016 - 2017

- Partnered with San Francisco public school teachers to design and implement science lessons for elementary school students

Bay Area Maker Faire Exposition, 2016 - Present

- Bay Area festival to present creative science and technology to the public, 100,000+ attendees
- Presented an exhibit demonstrating adaptive cellular responses to engage the public with life science research

Central Florida Society for Neuroscience, 2012 - 2015

- Student President, 2013-2015; Founding Member, 2012
- Wrote and won a chapter grant from the national organization
- Held large scale science education events for the public & received regional media coverage

High School Research Mentor, Satellite High School, 2013 - 2015

- Assisted high school students with the development and implementation of science fair projects
- Arranged for students to access laboratory equipment at the U. of Central Florida, trained students in molecular biology

Honors and Awards

- NSF Graduate Research Fellowship, 2017
- PhRMA Informatics Fellowship, PhRMA Foundation, 2017
- Honorable Mention, NSF Graduate Research Fellowship, 2016
- Amgen Scholar, University of California San Francisco, 2014
- Research & Mentoring Program Scholar, U. of Central Florida, 2013-2015
- Burnett Research Scholar, U. of Central Florida, 2013
- NIH Summer Fellow, National Institute on Aging, 2012
- Florida Academic Scholar, State of Florida, 2012-2015
- National Merit Scholar, 2012
- International Science & Engineering Fair Finalist, 2011, 2012