Jason D Fernandes, PhD

Experimental and **Computational** Molecular Biologist

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Overview

I have 15 years of graduate and post-graduate expertise in **stem cell biology**, **molecular biology, evolutionary biology**, **genomics**, and **virology** in both computational and experimental settings**.** I am passionate about using my **interdisciplinary knowledge** in creative ways and push the boundaries of cutting-edge biomedical research. My broad training allows me to **effectively communicate** with team members with diverse specializations so that together we can **develop innovative new technologies**.

Education

PhD	Pharmaceutical Sciences and Pharmacogenomics	UC San Francisco	2013
BS	Chemical Engineering [Minor, Computer Science]	Columbia University	2005

Major Research Projects

Project Scientist in SARS-CoV-2 Genomics — Jan 2020 - Current

UC Santa Cruz Genomics Institute
Collaboration with Dr. Maximilian Haeussler

- Collaborated with the UCSC Genome Browser team to release a **genome browser for the SARS-CoV-2 genome** (the coronavirus that causes COVID-19).
- **Widely-used** by researchers around the world (>10,000 weekly hits).

Postdoctoral Fellow/Scientist in Stem Cell Research — Feb 2016 - Current

UC Santa Cruz Genomics Institute/Howard Hughes Medical Institute
Laboratory of Dr. David Haussler & Dr. Sofie Salama

- Used **human and primate pluripotent stem cells**, to trace a "genetic arms race" between a set of proteins and retrotransposons over millions of years of evolution.
- Revealed how **genetic arms races impact human-specific evolution** by rewiring important gene expression networks in early embryonic development.
- **Directly managed** and mentored a team of 5 undergraduates and 2 technicians.

Graduate Student/Postdoc in HIV Evolution Research — Sep 2010 - Jan 2016

UC San Francisco, HIV Accessory and Regulatory Complex Center
Laboratory of Dr. Alan D Frankel

- Designed and performed **deep mutational scanning** of two HIV proteins (200 mutational libraries, sampling all codons at all amino acids) and **next generation sequencing** to reveal that overlapping genes do not evolve as previously thought.
- Established **reporter assays** and **viral replication assays** to characterize and **validate phenotypes** of individual mutants in the context of protein structures.

Graduate Student in HIV Proteomics Research — Sep 2006 - Oct 2010

UC San Francisco, HIV Accessory and Regulatory Complex Center
Laboratory of Dr. Alan D Frankel (collaboration with Dr. Nevan Krogan)

- Mapped human-HIV protein-protein interactions via **affinity purification and mass spectrometry (AP-MS)**.
- Validated **novel interaction partners** for HIV proteins using **immunoprecipitation** and **western blotting**. This approach was recently used to ID drug targets for SARS-CoV-2.

Experimental Skills

Molecular Biology [Cloning, PCR, immunoprecipitation]
Illumina Sequencing/Library Generation [RNA-SEQ, ChIP-SEQ]
Affinity Purification Mass Spectrometry [AP-MS]
Stem Cell Culture & Standard Cell Culture [hESC, iPSC, mESC]
Lentiviral Transductions/HIV-1 Live-Virus Replication [virus generation, ELISA, RNA isolation]
Deep Mutational Scanning [Comprehensive, gene-wide mutagenesis]

Computational Skills

Genomic/Next Generation Sequencing Analyses [bowtie/bwa, macs2, DE-SEQ]
UNIX/bash scripting [grep, sed, awk]
C/C++/Java [File I/O, algorithm implementation]
R [tidyverse]
Microsoft Office [Excel, Powerpoint, Word]
Adobe Creative Suite [Illustrator, Photoshop, Dreamweaver]

Leadership & Mentorship

UCSC STEM Postdocs Association [Symposium Co-Chair & Vice-Chair] **2017-present**

- Organized the 2018 and 2019 UC Santa Cruz Postdoc Symposia inviting keynotes to give non-scientific talks on critical issues on the future of science and scientific training:
  - Dr. Carol Greider (2009 Nobel Prize in Medicine)
  - Dr. David Lipman (CSO of Impossible Foods)
  - Dr. Keith Yamamoto (Vice Chancellor of Research, UCSF)
  - Dr. Cori Bargmann (Director of the Chan Zuckerberg Initiative)
  - Dr. Michael Rosbash (2017 Nobel Prize in Medicine)
  - Dr. Daphne Koller (CEO of insitro)
- Established organization from an informal collection of postdocs (see uspa.ucsc.edu).

eLife Early Career Ambassador **2017- present**

- Led an analysis of the academic job market (downloaded >10,000 times in one month). Now published in: Fernandes JD, Sarabipour S, Smith CT, et al. *Elife*. 2020

Mentorship: Graduate & Undergraduate Students **2008-present**

- Mentored 17 graduate/undergraduate students. All have positive career outcomes.

Fellowships and Grants

NHGRI R01 *[to Salama/Haussler, based off my work]* (2019-present)	4 years
Ruth L. Kirschstein F32 NIGMS NRSA (2018-2019)	1 year
Amgen Research Excellence Fellowship (2010)	1 year
Ruth L. Kirschstein T32 Support, *[to UCSF PSPG Program]* (2006-2008)	2 years

Selected Peer-Reviewed Publications

1. Fernandes JD, Hinrichs AS, Clawson H, Gonzalez JN, Lee BT, Nassar LR, et al. The UCSC SARS-CoV-2 Genome Browser. bioRxiv. 2020 May 4;2020.05.04.075945. *[under review at Nature Genetics]*

2. Fernandes JD, Zamudio-Hurtado A, Clawson H, Kent WJ, Haussler D, Salama SR, Haeussler M. The UCSC Repeat Browser allows discovery and visualization of evolutionary conflict across repeat families. *Mobile DNA* 2020 Mar 31;11:13.

3. Fernandes JD, Faust TB, Strauli NS, Smith CS, Crosby DC, Nakamura RL, Hernandez RD, Frankel AD. Functional segregation of overlapping genes in HIV. *Cell.* 2016 Dec 15, 167(7):1762-1773.e12.

Full list of publications at: https://bit.ly/jdf_pubs