

Curriculum Vitae

Swee S. Lim

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languages

English, Malay – *fluent*
Mandarin – *basic*

programming

Python – *main*
MATLAB, R – *proficient*
Java, C, C++ – *basic*
Bash, L^AT_EX, Jekyll,
Markdown

Education

- 2015 **Ph.D. Biomedical Engineering** University of California, Irvine
Multi-scale Structure-function Analysis of Mitochondrial Network Morphology and Respiratory State in Budding Yeast.
- 2009 **M.S. Biomedical Engineering** University of California, Irvine
- 2001 **M.Eng. Mechanical Engineering** Imperial College, London, United Kingdom

Research and Work Experience

- 2016 **University of California, Irvine** Irvine, California
Assistant Specialist
- 2012–2015 **University of California, Irvine** Irvine, California
Graduate Research Assistant, Susanne Rafelski lab
Developed a computational framework to quantify structure-function relationship in yeast mitochondrial networks. This is one of the first projects that attempts to integrate the study of mitochondrial bioenergetics at multiple spatial scales. This project requires a multi-disciplinary skillset of both:
- wet lab
 - confocal microscopy and molecular biology techniques.
 - dry lab
 - Developing quantitative image analysis pipeline, interactive data exploration programs, statistical analysis and coding batch jobs for the pipeline.
- Other responsibilities include:
- Troubleshooting, repairing and maintaining hardware in the lab (such as spinning disk confocal microscope and Linux file servers).
- 2009–2012 **University of California, Irvine** Irvine, California
Graduate Research Assistant, Steven George lab
Researched post-translational effects of *S-nitrosylation* on calcium channel receptors in human and mammalian smooth muscle cells. This project involved culturing primary human and bovine smooth muscle cells and studying their response to calcium excitation, then comparing the data to a mathematical model to determine how the frequency response of asthmatic cells differed from healthy cells.
- 2001–2007 **Tuas Power Singapore** Singapore
Business Analyst
Performed analysis of power consumption data and energy demand in newly liberalized electricity supply market. Responsible for developing risk profiles and mitigation strategies against spikes in fuel prices, forex and market demand. Also involved in stress testing financial portfolio of company against these risks.

Awards

- 2012 **CCBS opportunity award** Center for Complex Biological Systems, UC Irvine
A competitive award meant to foster collaboration between two labs with complementary skills. \$ 10,000 awarded to my lab and our collaborator (Professor Suzanne Sandmeyer). Project was to study the link between mitochondrial and cell morphology in a yeast strain that is able to metabolize fatty acids as a carbon source using 3D automated cell cytometry.
- 2008 **MCSB award** Center for Complex Biological Systems, UC Irvine
The Mathematical, Computational and Systems Biology award is a competitive, fully funded gateway year meant to introduce students to a doctoral program in departments that have systems biology related research. Rotated through several molecular biology labs and obtained my first exposure to molecular biology techniques such as histology, RT-PCR, primary cell culture and cell transfection.
- 1999 **Undergraduate Scholarship** Economic Development Board, Singapore
Full scholarship covering tuition and stipend to pursue undergraduate studies in London, United Kingdom.

Teaching and Mentoring Experience

- 2016 **Guest Lecturer** Biomedical Engineering (BME), UC Irvine
I gave a lecture and also held a lab section for a course in molecular and cell biophotonics. I demonstrated the tools I developed and showed how it could be used to study mitochondrial function in budding yeast using a spinning disk confocal microscope.
- 2012 **Teaching Assistant** BME, UC Irvine
TA for undergraduate classes in organ transport systems and signals analysis in biomedical systems. Responsibilities included leading weekly discussion and grading assignments.

Peer Reviewed Publications

Quantifying mitochondrial content in living cells

Matheus Palhares Viana*, Swee Lim*, Susanne M. Rafelski

Methods in Cell Biology, Academic Press, 2015

** co-first authors*

A quantitative structure-function analysis of mitochondrial network morphology and respiratory state in budding yeast

Swee Lim, Susanne M. Rafelski

in preparation

Oral and Poster Presentations

- 2015 **BME Department Seminar** BME, UC Irvine
Presented my work to department wide seminar attended by undergraduates, graduates and faculty.
- 2015 **Poster presentation** ASCB , San Diego, CA
A quantitative , multi-scale structure-function analysis of mitochondrial network morphology and respiratory state in budding yeast *Saccharomyces cerevisiae*.
- 2013 **Poster presentation** ASCB , New Orleans, LA
Quantifying the relationship between mitochondrial network topology and bioenergetics in budding yeast.
- 2013 **Talk and Poster presentation** MCB Retreat , Santa Monica, CA
Presented results of collaboration with Suzanne Sandmeyer lab on mitochondrial networks in a yeast strain that can metabolize fatty acids as a carbon source.

Professional Memberships

- American Society of Cell Biology
- Biomedical Engineering Society

Interests

Professional: data analysis, software engineering, machine learning, file and storage systems. **Personal:** swimming, gymnastics, automotive repair, mechatronics.