Kimberly McCabe

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EDUCATION:

University of California, San Diego La Jolla, CA

PhD, Bioengineering with a Specialization in Multiscale Biology *April 2019*

- Dissertation title: “Multiscale Computational Approaches for the Study of Dilated Cardiomyopathy Mechanisms and Therapy”

Master of Science, Bioengineering *December 2016*

Yale University New Haven, CT

Bachelor of Science, Biomedical Engineering *May 2013*

EXPERIENCE:

Simula Research Laboratory Oslo, Norway

Research Scientist *Jan 2019- Present*

SUURPh Programme Coordinator

- Conduct the annual Simula Summer School in Computational Physiology, organize scientific lectures and design curricula.
- Coordinate scientific collaborations between Simula, the University of Oslo, and UCSD. Supervise 8 co-mentored PhD students in the field of computational medicine.

Cardiac Mechanics Research Group at UCSD La Jolla, CA

Graduate Student Researcher *Sept 2014- Apr 2019*

- Developed multi-scale Monte Carlo Markov State, molecular dynamics, and reaction-diffusion models of myocardial function at the molecular, sarcomere, and cell level
- Studied effects of novel dATP therapy on cardiac contraction and calcium handling through computational simulation

LEADERSHIP:

UCSD Graduate Student Association La Jolla, CA

Vice President of External Affairs *July 2015-October 2018*

• Performed outreach and advocacy at the UC, local, state, and national level on behalf of the Graduate Student Association and the 7,000 graduate and professional students at UCSD.

Student Advocates for Graduate Education

Vice Chair *June 2017-June 2018*

• Chief administrative and operations officer for a coalition of public R1 institutions who advocate for access and affordability to graduate education

TEACHING:

Simula Research Laboratory Oslo, Norway

Course Instructor, Summer School in Computational Physiology

- Lecture and conduct hands-on coding exercises in modelling of cardiac mechanics and calcium handling

UCSD Bioengineering Department La Jolla, CA

Course Instructor, BENG 276 *Jan 2016- March 2018*

- Co-taught a graduate course entitled “Numerical Analysis for Multiscale Biology”. Lectured and provided hands-on tutorials on modeling subcellular systems using the Virtual Cell software.

Teaching Assistant, BENG 110 (Continuum Mechanics)

PUBLICATIONS:

- Aboelkassem Y, Powers JD, **McCabe KJ**, McCulloch AD (2019). Multiscale Models of Cardiac Muscle Biophysics and Tissue Remodeling in Hypertrophic Cardiomyopathies. *Current Opinion in Biomedical Engineering*. (accepted)
- Aboelkassem Y, **McCabe KJ**, Huber GA, Regnier M, McCammon JA, McCulloch AD (2019). A Stochastic Multiscale Model of Cardiac Thin Filament Activation Using Brownian-Langevin Dynamics. *Biophys J*. doi: 10.1016/j.bpj.2019.08.003.
- Powers JD, Yuan CC, **McCabe KJ**, Murray JD, Childers MC, Flint GV, Moussavi-Harami F, Mohran S, Castillo R, Zuzek C, Ma W, Daggett V, McCulloch AD, Irving TC, Regnier M (2019). Cardiac myosin activation with 2-deoxy-ATP via increased electrostatic interactions with actin. *Proc Natl Acad Sci U S A*. 116(23). doi: 10.1073/pnas.1905028116.
- **McCabe KJ***, Dewan S*, Regnier M, McCulloch AD (2017). Insights and Challenges of Multi-scale Modeling of Sarcomere Mechanics in cTn and Tm DCM mutants–Genotype to Cellular Phenotype. Frontiers in Physiology, 8, p 151. * Co-first authors
- Dewan S, **McCabe KJ,** Regnier M, McCulloch AD, Lindert S (2016) Molecular Effects of cTnC DCM Mutations on Calcium Sensitivity and Myofilament Activation - An Integrated Multi-Scale Modeling Study. *J. Phys. Chem.* 120 (33), pp 8264–8275
- Aboelkassem A, Bonilla JA, **McCabe KJ**, Campbell SG (2015) Contributions of Ca2+-Independent Thin Filament Activation to Cardiac Muscle Function. *Biophys J.* 109:2101-2112.

PRESENTATIONS:

- **Poster**, “A Markov State Model of the Sarcomere to Explain the Effects of dATP on Cardiac Contraction”, Biophysical meeting, February 2018, San Francisco, CA.

AWARDS/ACHIEVEMENTS:

- 2018-2019 Engelson Ph.D. Thesis Award in Bioengineering, June 2019
- Siebel Scholar, Class of 2019
- R.B. Wooley Award for Engineering Leadership/ Gordon Fellowship: May 2018
- NIH Ruth Kirschstein National Service Awardee: July 2017-April 2019
- Rita L Atkinson Graduate Fellowship: June 2016-June 2017
- Frontiers of Innovation Scholars Program (FISP) Fellowship for multidisciplinary research: February 2016- June 2017