

Curriculum Vitae

Frazer I. Heinis
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Education

2009-2015

Ph.D., Biochemistry, Molecular Biology, and Biophysics
University of Minnesota
Minneapolis, MN

Thesis: "Molecular dissection of compensatory pathways in models of severe heart failure."

2005-2009

B.S., Molecular and Cellular Biology
Johns Hopkins University
Baltimore, MD

Research Experience

2015-Present

Postdoctoral Associate
Department of Integrative Biology and Physiology
University of Minnesota, Minneapolis, MN
Laboratory of Joseph M. Metzger

2009-2015

Graduate Research Assistant
Department of Biochemistry, Molecular Biology, and Biophysics
University of Minnesota, Minneapolis, MN
Advisor: Joseph M. Metzger

Project: Investigated the relationship between altered Ca^{2+} cycling and cardiac dysfunction in a mouse model of inducible, cardiac-specific *Serca2* gene ablation. Designed and performed experiments utilizing Langendorff perfusion of isolated mouse hearts, IonOptix measurements of sarcomere dynamics in isolated cardiac myocytes, *in vivo* telemetry and running wheel behavior, immunoblot analysis, and confocal fluorescence imaging of Ca^{2+} release events. Managed animal colony with several distinct lines of transgenic and knockout mice. Performed a collaborative project studying cardiac function and metabolic performance in the 13-lined ground squirrel, a mammalian hibernator, during the summer active and winter torpid seasons.

2008-2009

Student Assistant
Department of Embryology
Carnegie Institution of Washington, Baltimore, MD

Advisor: Judith L. Yanowitz

Project: Carried out an extensive polymorphism mapping study in *C. elegans* to investigate X chromosome-specific meiotic nondisjunction. Identified chromosome-specific patterns of meiotic recombination in *him-5* mutant animal populations. Performed confocal 3D reconstructions to identify chromosome-specific loss of synaptonemal complex proteins and to investigate chromosome nondisjunction at diakinesis.

Awards

5/2014	Huber Warner Fellowship
1/2014-12/2014	American Heart Association Predoctoral Fellowship
5/2012	Finalist, Maurice B. Visscher Symposium Young Investigators' Competition, 2 nd place graduate student. May 23, 2012. "Conditional <i>Serca2</i> ablation impairs cardiac contractility with maintained functional reserve"
6/2011-12/2013	NIH T32 Training Grant: Functional Proteomics of Aging
2009-2010	University of Minnesota Graduate School Fellowship
2005-2009	Marshall H. and Nellie Alworth Scholarship

Teaching Experience

2012

Teaching Assistant

Managed two sections of BioC 4025 "Laboratory in Biochemistry" at the University of Minnesota. Worked with course instructor and laboratory coordinator to plan and implement an upper-level undergraduate biochemistry lab; led weekly laboratory sessions; designed refinements to course protocols; and graded weekly reports and in-lab notebooks.

Teaching Assistant

Managed MCDG 8920 "MCDG Special Topics". This is the introductory course taken by all graduate students entering the University of Minnesota's graduate programs in Biochemistry or Genetics. Course takes place at the Itasca Biological Station, a field research laboratory in northern MN, and consists of two weeks of planned laboratory modules. TA responsibilities included assisting visiting faculty instructors, administering laboratory modules, preparing experiments each day, and mentoring incoming graduate students. With one other TA, designed and administered multi-day laboratory module.

Memberships

2011-Present Biophysical Society

Publications

Frazer I. Heinis, Katie L. Vermillion, Matthew T. Andrews, and Joseph M. Metzger. 2015. "Myocardial performance and adaptive energy pathways in a torpid mammalian hibernator." *Am J Physiol Regul Integr Comp Physiol* **309**(4):R368-77.

Frazer I. Heinis, Kristin B. Andersson, Geir Christensen, and Joseph M. Metzger. 2013. “Prominent Heart Organ-Level Performance Deficits in a Genetic Model of Targeted Severe and Progressive SERCA2 Deficiency.” *PLoS One* **8**(11):e79609.

Wang Wang, Matthew S. Barnabei, Michelle L. Asp, **Frazer I. Heinis**, Erik Arden, Jennifer Davis, Elizabeth Braunlin, Qi Li, Jonathan Davis, James D. Potter, and Joseph M. Metzger. 2013. “Noncanonical EF-hand motif strategically delays Ca²⁺ buffering to enhance cardiac performance”. *Nature Medicine* **19**(3):305-12.

Michelle L. Asp, Joshua J. Martindale, **Frazer I. Heinis**, Wang Wang, and Joseph M. Metzger. 2013. “Calcium mishandling in diastolic dysfunction: Mechanisms and potential therapies”. *Biochim Biophys Acta* **1833**(4):895-900.

Philip M. Meneely, Olivia McGovern, **Frazer I. Heinis**, and Judith L. Yanowitz. 2012. “Crossover distribution and frequency are regulated by him-5 in *Caenorhabditis elegans*”. *Genetics* **190**(4):1251-66.

Presentations

Frazer I. Heinis. Keynote address, Proctor-Hermantown “Excellence in Education” Banquet. May 6, 2015. Duluth, MN.

Frazer I. Heinis and Joseph M. Metzger. “Phospholamban-independent adrenergic reserve in *Serca2* ablated hearts.” Platform talk, Cardiac Muscle Regulation session, Biophysical Society 59th Annual Meeting, February 7-11, 2015. Baltimore, MD.

Frazer I. Heinis, Kristin B. Andersson, Geir Christensen, and Joseph M. Metzger. “β-adrenergic-mediated inotropy and lusitropy in conditional cardiac *Serca2* ablated mice.” Platform talk, Cardiac Muscle I session, Biophysical Society 57th Annual Meeting, February 2-6, 2013. Philadelphia, PA.

Posters

Frazer I. Heinis, Joseph M. Metzger. “Sarcoplasmic reticulum-independent contractile function in *Serca2* ablated hearts.” Biophysical Society 58th Annual Meeting, February 15-19. San Francisco, CA.

Frazer I. Heinis, Kristin B. Andersson, Geir Christensen, and Joseph M. Metzger. “Conditional *Serca2* ablation impairs systolic and diastolic performance of isolated perfused hearts.” Biophysical Society 56th Annual Meeting, February 25-29, 2012. San Diego, CA.

Frazer I. Heinis, Kristin B. Andersson, Geir Christensen, and Joseph M. Metzger. “Determination of the effects of conditional *Serca2* gene ablation on susceptibility to cardiac ischemic injury.” Keystone Symposium on Molecular Cardiology, February 22-27, 2011. Keystone Resort, Keystone, CO.