Ruth F. Sommese, Ph.D.

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Research Positions

2015–present *Life Sciences Research Foundation (LSRF) Postdoctoral Fellow*
Genetics, Cell Biology, and Development
University of Minnesota (Twin Cities)
PI: Sivaraj Sivaramakrishnan

2014 – 2015 *LSRF Postdoctoral Fellow*
Cell and Developmental Biology
University of Michigan (Ann Arbor)
PI: Sivaraj Sivaramakrishnan

Education

2013 *Ph.D.* in Biochemistry, Stanford University, CA
Thesis advisor: James Spudich

2008 *B.Sc*. in Biochemistry, University of Notre Dame, IN (GPA 3.9/4.0)
Undergraduate research advisor: Brian Baker

Publications

2016 **Sommese RF**, Sivaramakrishnan. Substrate Affinity Differentially Influences Protein Kinase C Regulation and Inhibitor Potency. 2016 **J Biol Chem** 291(42):21963-21970.

2016 **Sommese RF**, Hariadi RF, Kim K, Liu M, Tyska MJ, Sivaramakrishnan S. Patterning Protein Complexes on DNA Nanostructures Using a GFP-Nanobody. 2016 **Protein Science** 25(11): 2089–2094.

ǂFeatured: Protein Science 25(11), In This Issue

2016 Swanson CJ, **Sommese RF**, Petersen KJ, Ritt M, Karslake J, Thomas DD, Sivaramakrishnan S. Calcium stimulates self-assembly of Protein Kinase C α *in vitro.* 2016 **PLoS One** 11(10):e0162331.

2016 **Sommese RF**, Sivaramakrishnan S. Engineering synthetic myosin filaments using DNA nanotubes. *Methods in Molecular Biology, Molecular Motors: Methods and Protocols, Second Edition*, Accepted

2015 Hariadi RF*, **Sommese RF***, Adhikari AS, Taylor RE, Sutton S, Spudich JA, Sivaramakrishnan S. Mechanical coordination in motor ensembles revealed using engineered artificial myosin filaments. 2015 **Nat Nanotechnol** 10:696-700. **Equal Contribution*

ǂNews and Views: Debold E.P. Biological machines: Molecular motors teamwork. 2015 Nature Nano 10:656–657.

2015 Hariadi RF, **Sommese RF**, Sivaramakrishnan S. Tuning myosin-driven sorting on cellular actin networks. 2015 **eLife**. *doi: 10.7554/eLife.05472.*

2015 Pan S*, **Sommese RF*,** Sallam KI, Nag S, Sutton S, Miller SM, Spudich JA, Ruppel KM, Ashley EA. Establishing Disease Causality for a Novel Gene Variant in Familial Dilated Cardiomyopathy Using a Functional In-Vitro Assay of Regulated Thin Filaments and Human Cardiac Myosin. 2015 **BMC Medical Genetics** 16:97 **Equal Contribution*

2015 Nag S, **Sommese RF**, Uifalusi Z, Combs A, Langer S, Sutton S, Leinwand L, Geeves M, Ruppel KM, Spudich JA. Contractility parameters of human β-cardiac myosin with the hypertrophic cardiomyopathy mutation R403Q show loss of motor function. 2015 **Science Advances** 1(9):e1500511.

2015 Spudich JA, Aksel T, Bartholomew SR, Nag S, Kawana M, Yu EC, Sarkar SS, Sung J, **Sommese RF**, Sutton S, Cho C, Adhikari AS, Taylor R, Liu C, Trivedi D, and Ruppel KM. Effects of hypertrophic and dilated cardiomyopathy mutations on power output by human β-cardiac myosin. 2015 **J Exp Biol** 219:161-167.

2014 Gupte TM, Haque F, Gangadharan B, Sunitha MS, Mukherjee S, Anandhan S, Rani DS, Mukundan N, Jambekar A, Thangaraj K, Sowdhamini R, **Sommese RF**, Nag S, Spudich JA, Mercer JA. Mechanistic Heterogeneity in Contractile Properties of TPM1 Mutants Associated with Inherited Cardiomyopathies. 2014 **J Biol Chem** 290:7003-7015.

2013 **Sommese RF*,** Sung J*, Nag S*, Sutton S, Deacon J, Choe E, Lienwand L, Ruppel K, Spudich JA. (2013). Molecular consequences of the R453C hypertrophic cardiomyopathy mutation on human β-cardiac myosin motor function. 2013 **PNAS** 110(31):12607-12612. **Equal Contribution*

ǂCommentary: Muretta JM, Thomas DD. Mutation that causes hypertrophic cardiomyopathy increases force production in human β-cardiac myosin. 2013 PNAS 110(31):12507-12508.

2013 **Sommese RF***, Nag S*, Sutton S, Miller SM, Spudich JA, Ruppel K. Effects of troponin T hypertrophic and dilated cardiomyopathy mutations on the calcium sensitivity of the regulated thin filament and its interaction with human β-cardiac myosin. 2013 **PLoS One** 8(12):e83403 **Equal Contribution*

2010 **Sommese RF**, Sivaramakrishnan S, Baldwin RL, Spudich JA. Helicity of short E-R/K peptides. 2010 **Protein Sci** 19(10), 2001-5.

2009 Piepenbrink KH, Borbulevych OY, **Sommese RF**, Clemens J, Armstrong KM, Desmond C, Do P, Baker BM. Fluorine substitutions in an antigenic peptide selectively modulate T-cell receptor binding in a minimally perturbing manner. 2009 **Biochem J**, 423(3), 353-61.

2009 Borbulevych OY, Piepenbrink KH, Gloor BE, Scott DR, **Sommese RF**, Cole DK, Sewell AK, Baker BM. T cell receptor cross-reactivity directed by antigen-dependent tuning of peptide-MHC molecular flexibility. 2009 **Immunity**, 31(6), 885-896.

2003 Ruchti R, Karmgard D, Albrecht M, Andert K.b , Anselmino P, Baumbaugh B, Bishop J, Clendenen V, Dauerty H, Dreher D, Hurlbut C, Jensen M, Kamat N, Marchant B, Marchant J, McKenna M, Rozzi A, Slusher A, **Sommese R**, Sparks T, Vigneault M. Waveshifters and scintillators for the detection of ionizing radiation. 2003 **IEEE Nuclear Science Symposium Conference Record**, 2:N36-2, 1086-1090.

Research Talks

10/14/2016 Life Science Research Foundation Research Symposium

9/23/2016 Chicago Cytoskeleton Forum, Northwestern University
7/20/2016 Gordon Research Conference: Muscle and Molecular Motors
6/5/2016 Gordon Research Symposium: Phosphorylation and G-Protein Mediated Signaling Networks
6/15/2015 Cytoskeleton Club, University of Michigan
5/17/2013 Gladstone Institute Symposium: Human Cardiomyopathy Models: Molecules to iPS Cells Symposium, UCSF
4/19/2013 Cellular and Molecular Biology Graduate Symposium, Stanford University
3/27/2013 Cardiovascular Institute Seminar, Stanford University Medical School
11/7/2012 27th European Cytoskeleton Forum EMBO/FEBS Conference: Novel Biophysical Approaches in the Investigation of the Cytoskeleton, Pécs, Hungary
10/9/2012 Stanford Biochemistry Departmental Retreat, Stanford University

Awards

2014 – 2017 *Life Sciences Research Foundation Postdoctoral Fellowship***,** three year-merit based fellowship
2014 Awarded the *National Science Foundation Postdoctoral Research Fellowship* in Intersections of Biology and Mathematical and Physical Sciences and Engineering [*Declined*]
2012 *FEBS Transcontinental Youth Travel Fellowship,* travel award and invited talk for the 2012 European Cytoskeleton Forum meeting
2011-2014 *Paul Berg Bio-X Stanford Interdisciplinary Graduate Fellowship in Human Health,* three-year merit based fellowship
2008 *William R. Wischerath Outstanding Chemistry and Biochemistry Award***,** merit-based academic award, University of Notre Dame
2008 *Phi Betta Kappa Honorary Society Lifetime Membership,* merit-based
2007 *Norbert L. Wiech Outstanding Junior Student Award***,** merit-based academic award, University of Notre Dame
2007 *Tri-University Undergraduate Research Symposium Best Poster Award,* University of Notre Dame
2007 *College of Science Summer Undergraduate Research Fellowship* for summer project with Dr. Brian Baker, University of Notre Dame
2004-2008 *Dean's Honor List,* awarded each undergraduate semester at University of Notre Dame

Teaching

Spring 2017 *FRET Module Assistance*: "Special Topics in Biology: Quantitative Fluorescence" (GCD 8920/BIOL 5950)
University of Minnesota
Directed by Dr. Sivaraj Sivaramakrishnan

Fall 2012 *Guest Lecturer*: "Interdisciplinary Approaches to Biochemistry: Single Molecule Biophysics to Clinical Outcomes" (Bios207)
Stanford University
Directed by Dr. James Spudich and Dr. Kathleen Ruppel

Fall 2010 *Teaching Assistant*: "Biological Macromolecules" (Bioc241)
Stanford University

Directed by Dr. Daniel Herschlag

Outreach

2016	"College of Biological Science College Day," University of Minnesota, *Instructor*
2014	"College 101," University of Michigan, *Instructor*
2014	"FEMMES Saturday Science Day," University of Michigan, *Group Leader*
2013	"Bio-X Kids Science Day," Stanford University, *Group Leader*
2012	"Science Bus," Stanford University, *Instructor*