

Matthew Mitsche, PhD

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EDUCATION

University of Texas Southwestern Medical Center, Dallas, TX

Postdoctoral Fellowship

2011-Present

Research focused on application of mass spectral technology to lipid physiology.

Mentors: Helen H. Hobbs, M.D. & Jonathan C. Cohen Ph.D.

Boston University, Boston, MA

Ph.D. in Physiology and Biophysics

2011

Thesis: "Interfacial Properties of the N-Terminal Lipid Binding Domains of

Apolipoprotein B and their Role in Triacylglyceride-Rich Lipoprotein Assembly"

Mentor: Donald M. Small, M.D.

University of Delaware, Newark, DE

B.S in Chemical Engineering

2006

Minors: Biochemical Engineering and Political Science

EXPERIENCE

Assistant Professor: UT Southwestern Medical Center

2018-Present

Manage laboratory aiming to understand the progression of fatty liver disease by focusing on dysfunction in fatty acid sorting between lipid classes. Two primary focuses are developing high-sensitivity deuterium tracing technology and characterizing genes causing fatty liver by characterizing genetically modified mice. Additional projects include studying cholesterol biosynthetic intermediates and phosphatidylinositol signaling.

Postdoctoral Research Fellow: UT Southwestern Medical Center

2011-2018

Fellowship in the Department of Molecular Genetics focused on the development and application of mass spectrometry-based lipidomics and stable isotope labeling in cells, in mice and in plasma samples from humans. Emphasis in the areas of sterol metabolism & biosynthesis, non-alcoholic fatty liver disease, and lipidomics software development. Included supervision of a lab assistant and computer programmer and mentoring students.

Graduate Student, Physiology and Biophysics: Boston University Medical Center

2006-2011

Research centered on physical and surface chemistry to model behavior of peptides derived from apolipoprotein B and apoA-I adsorbed to triacylglyceride/water or triacylglyceride/phospholipid/water interfaces.

Research Assistant: University of Delaware

2003 - 2006

SELECTED PUBLICATIONS (FROM 21 PEER REVIEWED PAPERS)

Mitsche, MA, Hobbs, HH, Cohen, JC. Patatin-like phospholipase domain-containing protein 3 promotes transfer of essential fatty acids from triglycerides to phospholipids in hepatic lipid droplets. *JBC* 293(24):9232, 2018

Mitsche, MA, McDonald, JG, Hobs HH, Cohen JC. Flux analysis of cholesterol biosynthesis in vivo reveals multiple tissue and cell-type specific pathways. *eLife* 10.7554, 2015

Wang, J, **Mitsche, MA**, Lutjohann, D, Cohen, JC, Xie, XS, Hobbs, HH. *Relative Role of ABCG5/G8 in liver and intestine*. *J Lipid Res* 2015 56(2): 319-30

Mitsche, MA, Packer, LE, Jiang, ZJ, Brown, JW, Small, DM, McKnight, CJ. Surface tensiometry of apolipoprotein B domains at lipid interfaces suggests a new model for the initial steps in triglyceride-rich lipoprotein assembly; *J Biol Chem*, 289(12): 9000-12, 2014

Mitsche, M.A., Small, D.M. Surface pressure dependent remodeling of amphipathic α -helices at a triolein/water interface. *J Lipid Res*, 54(6): 1578-88, 2013

Mitsche, M.A., Small, D.M. C-terminus of apolipoprotein A-I removes phospholipids (PL) from a triolein/PL/water interface, but the N-terminus does not: A possible mechanism for nascent HDL assembly. *Biophysical Journal*, 101(2) pp. 353-361, 2011

Mitsche, M.A., Wang, L., Small, D.M. Adsorption of egg-PC to an air/water and triolein/water interface: Use of the 2-dimensional phase Rule to estimate the surface composition of a phospholipid/triolein/water surface as a function of surface pressure. *J of Physical Chemistry* 114(9): 3276-3284, 2010

Mitsche, M.A. Small, D.M., Wang, L. The adsorption of biological peptides and proteins at the oil/water interface. A potentially important but largely unexplored field. *J Lipid Res*, Vol. 50, S329-S334, 2009

GRANTS

**NIGMS Grant Number 5 K01GM109317 (PI)
2013-2018**

Metabolomics Fellowship & Transition to Independence

TECHNICAL SKILLS

Instrumentation: Mass Spectrometry (LC-MS/MS, GC-MS, q-TOF), High Pressure Liquid Chromatography, Drop Tensiometry, Langmuir Trough, Spectroscopy, Molecular Dynamic Simulation, Fluorescence, UV-Visible & Circular-Dichroism Spectroscopy, and Isothermal Titration Differential Scanning Calorimetry

Laboratory: Mouse handling, breeding and dissection, mammalian & bacterial cell culture, recombinant protein preparation, lipid extraction, high throughput sample preparation, thin layer chromatography, assay development and validation

Software: Matlab, Python, Mathcad, Simulink, End Note, and Microsoft Office Suite

SELECTED AWARDS AND PRESENTATIONS

- 2016 Deuel Conference Travel Award and Poster Presentation Award
- 2013,2014 & 2015 Lipid MAPS Young Investigator Award; La Jolla, CA
- 2011 & 2013 Kern Conference Presentation and Travel Award; Aspen, CO
- 2012 Stable Isotopes in Metabolic Research Presentation; Little Rock AR
- 2010 & 2012 Lipoprotein Gordon Conference, Poster and Oral Presentation