Karen Mruk kmruk@stanford.edu

Education

Ph. D., Biomedical Science 2005-2012
University of Massachusetts Medical School, Worcester, MA
Concentration: Chemical Biology

B.A. Biochemistry 1999-2003
Drew University, Madison, NJ
Cum Laude and Specialized Honors in Biochemistry

Academic Research

Post-Doctoral Research, Stanford University, Stanford, CA Present
Mentor: Professor James K. Chen

Graduate Research, University of Massachusetts Medical School, Worcester, MA 2005-2012
Ph. D. Thesis Research, Mentor: Professor William R. Kobertz
Small Molecule Investigation of KCNQ Potassium Channels.
My graduate student research focused on the identification and use of small molecules to probe the assembly and function of the KCNQ family of voltage-gated K^+ channels. During my initial attempts to chemically activate KCNQ channels, I discovered that phenylboronic acid activates KCNQ complexes at millimolar concentrations by targeting the ion conduction pathway. For my second project, I used a panel of intracellular tethered blockers to probe the location and orientation of calmodulin binding to KCNQ channels. Using the distances calculated we generated a structural model which positions calmodulin adjacent to the gate of KCNQ channels.

Undergraduate Research, Drew University, Madison, NJ 2002-2003
Honors Thesis Research, Mentors: Professors Melanie Lenahan and Victoria Chang
Overexpression of CaM Kinase II Alpha in NG108-15 Cells
During my independent research I optimized growth and transfection conditions for the neuronal hybrid cell line, ND108-15. I over-expressed CaM kinase II α and the regulatory phosphatase, PPMF1, in these cells to determine the effect overexpression of these proteins had on apoptosis.

Industry Research

Junior Chemist, Revlon, Inc., Edison, NJ 2003-2005
Hair Care / Hair Color Laboratory, Supervisor: Melissa Kellet

Research Assistant, Unilever Research, Edgewater, NJ 2003-2003
Skin Material Science Laboratory, Supervisor: Yang Zhou

Research Intern, L'Oreal USA, Clark, NJ 2001-2002
Hair Color Laboratory, Supervisor: Patrick Walston

Publications

Mruk, K, Shandilya, SM, Blaustein, RO, Schiffer, CA, and Kobertz, WR. (2012) Structural Insights into Neuronal K+ Channel-Calmodulin Complexes. *Proc Natl Acad Sci* USA, 109, 13579-13583.

O'Connell, D*, **Mruk, K*,** Rocheleau, JM and Kobertz WR. (2011) *Xenopus laevis* oocytes infected with multi-drug resistant bacteria: implications for electrical recordings. *J Gen Physiol 138*, 271-277.
Selected commentary: *J Gen Physiol 138*, 131.; ***Cover Art***

Mruk, K and Kobertz WR. (2009) Discovery of a Novel Activator of KCNQ1-KCNE1 K+ Channel Complexes. *PLoS One*, *4*, e4236.

Clancy, L, **Mruk, K**, Archer, K, Woelfel, M, Mongkolsapaya, J, Screaton, G, Lenardo, M, Chan, FK. (2005) Preligand assembly domain-mediated ligand-independent association between TRAIL receptor 4 (TR4) and TR2 regulates TRAIL-induced apoptosis. *Proc Natl Acad Sci* U S A., *102*, 18099–18104.

* Equal contribution

Honors and Awards

Student Service Award for Outstanding Mentoring, UMass Medical School	2010
American Institute of Chemists Award	2003
Schering Plough Scholarship in the Sciences Award	2002
Grant-In-Aid Recipient, NJ Junior Academy of Sciences	1999

Presentations and Meetings

Platform: Mruk, K, Shandilya, SM, Blaustein, RO, Schiffer, CA, and Kobertz, WR. Structural Insights into Calmodulation of Neuronal KCNQ Channels. **Biophysical Society 56th Annual Meeting** (2011), San Diego, CA.

Poster: Mruk, K, Blaustein, RO, and Kobertz, WR. Pinpointing Calmodulin in Functioning KCNQ Channel Complexes. **Biophysical Society 55th Annual Meeting** (2010), Baltimore, MD.

Poster: Mruk, K, Blaustein, RO, and Kobertz, WR. Pinpointing Calmodulin in Functioning KCNQ Channel Complexes. **Gordon Research Conference: Ion Channels** (2010), Tilton, NH.

Poster: Mruk, K and Kobertz, WR. Phenylboronic Acid: Novel Activator of KCNQ1/KCNE1 Channel Complexes. **Biophysical Society 53rd Annual Meeting** (2009) Boston, MA

Poster: Mruk, K and Kobertz, WR. Phenylboronic Acid: Novel Activator of KCNQ1/KCNE1 Channel Complexes. **Gordon Research Conference: Ion Channels** (2008) Tilton, NH

Poster: Mruk, K and Kobertz, WR. Identification of a Small Molecule Activator of KCNQ1/KCNE1 Channel Complexes. **Biophysical Society 52nd Annual Meeting** (2008) Long Beach, CA

Teaching Experience

Graduate School of Biomedical Sciences
University of Massachusetts Medical School
Scientific Writing
(Teaching Assistant, 2008–2010)

Department of Chemistry
Drew University
Organic Chemistry I and II
(Peer Workshop Leader 2002, 2003)

Departments of Chemistry and Biology
Drew University
General Chemistry I and II, Organic Chemistry I and II
(Academic Assistant, 2001-2003)
Biology of Animals, Genetics and Evolution
(Academic Assistant, 2000-2001)

Professional Associations and Committees

STEM Professional, National Lab Day Network	2009-present
Curriculum Committee, UMass Medical School	2008-2012
Biochemistry Student Seminar Committee	2008-2010
Graduate Faculty Council, UMass Medical School	2008-2010
American Association for the Advancement of Science (AAAS)	2007-present
Biophysical Society	2006-present
Society of Cosmetic Chemists	2003-2005
American Institute of Chemists	2003-2005
Beta Beta Beta, Drew University Chapter	2001-2003
Drew University Chemistry Society	2000-2003