

# Theses for Honors in Biochemical Sciences 2011

## **Maia Anderson**

*Re-Evaluating the Role of Endoplasmic Reticulum Stress in Taxol-Induced Apoptosis*

Dr. Randall King, Laboratory Sponsor

## **Walker Cole Arledge**

*The Hippo Pathway in Human Embryonic Stem Cells and Endodermal Progenitors*

Professor Doug Melton, Laboratory Sponsor

## **Ebenezer Asare**

*Regulation of Human Lateral Frontal Cortex Development*

Dr. Christopher A. Walsh, Laboratory Sponsor

## **David Billing ~ Recipient of the Hoopes Prize**

*Investigating the role of TRPC5 and TRPC6 in actin cytoskeletal dynamics in the podocytes*

Professor Anna Greka, Laboratory Sponsor

## **Alexander Boardman**

*A Potential Role for Lipid Droplets and the Transport Protein Klarsicht in Hedgehog Processing and Axon Transport*

Professor Samuel Kunes, Laboratory Sponsor

## **Nicholas Bodnar**

*Structural Origins of Heterogeneity in Notch Ankyrin Repeat Domains*

Professor Stephen Blacklow, Laboratory Sponsor

## **Yi Cai**

*The role of p53 mutation in anchorage-independant survival of fallopian tube epithelial cells*

Professor Joan Brugge, Laboratory Sponsor

## **Arhana Chattopadhyay ~ Recipient of the Hoopes Prize**

*D. discoideum Integrate Chemical and Mechanical Signals to Achieve Directional Motility*

Dr. Jeremy Gunawardena, Laboratory Sponsor

**Alissa D'Gama ~ Recipient of the Hoopes Prize**

*SAD kinases and neuronal polarization: examination of regulatory phosphorylation sites*

Professor Joshua Sanes, Laboratory Sponsor

**Denzil Douglas**

*Investigating the regulatory pathway of Target of Rapamycin Complex 2 in *Caenorhabditis elegans**

Professor Alexander Soukas, Laboratory Sponsor

**David Gootenberg**

*The Identification of Xenobiotic-Inducible Genetic Elements in the Human Gut Microbiome*

Dr. Peter Turnbaugh, Laboratory Sponsor

**Meng Xiao He**

*Functional characterization of a putative H3K4 methylation genetic network*

Professor Frederick Roth, Laboratory Sponsor

**Jimmy Hom**

*microRNA-1 Accelerates Adipogenesis and Promotes the Expression of Uncoupled Protein-1 in Human White Adipose-Derived Stromal Vascular Cells*

Dr. Chad Cowan, Laboratory Sponsor

**Johnny Hu**

*The of ATP Binding and Hydrolysis by UrvA in Dimerization and DNA Binding and Repair*

Professor David Jeruzalmi, Laboratory Sponsor

**Alexia Hwang**

*Genetic Identification and Characterization of Negative Regulators of the Exogenous RNA interference Pathway and their Role in Endogenously Generated Small RNAs of *Caenorhabditis elegans**

Professor Gary Ruvkun, Laboratory Sponsor

**Fathima Jahufar**

*Recruitment of effectors to the type-III secretion apparatus of bacterial pathogens by class 1B chaperones*

Dr. Cammie Lesser, Laboratory Sponsor

**Nina Jain**

*Measuring mistranslation rates in the presence of environmental stressors in *Mycobacterium smegmatis**

Professor Eric Rubin, Laboratory Sponsor

**Lynn Jiang**

*Long range intra-chromosomal repair of DNA double strand breaks in different cell types and loci*

Professor Frederick Alt, Laboratory Sponsor

**Judith Kim**

*Downstream mediators of Lkb1 regulation of metabolic functions in hematopoiesis*

Dr. Nabeel El-Bardeesy, Laboratory Sponsor

**Yunsoo Kim ~ Recipient of the Hoopes and Henderson Prizes**

*A conserved cytoplasmic tyrosine kinase functions in the transport of silencing RNA between C. elegans cells*

Professor Craig Hunter, Laboratory Sponsor

**John Koullias**

*Modeling the Neurogenetic Behavior of Vascular Cells Using Microfluidic Systems*

Professor David Mooney, Laboratory Sponsor

**Phoebe Kuo**

*The Contribution of Immune Cells to Muscle Regeneration during Muscular Dystrophy*

Professor Amy Wagers, Laboratory Sponsor

**Jennifer Kusma**

*Defining Subpopulations of the Pancreatic Mesenchyme and The Effects on Progenitor Cells Differentiating Along the  $\beta$  Cell Lineage*

Professor Doug Melton, Laboratory Sponsor

**Dayan Jack Li**

*Characterizing Prmd8 expression and function in Sonic hedgehog-directed neural patterning*

Professor Andrew McMahon, Laboratory Sponsor

**Alison Liewen**

*Exploring the effectiveness of IL-6 and IL-8 in the removal of circulating tumor cells from the bloodstream of mice*

Dr. Ronald DePinho, Laboratory Sponsor

**Charles Liu ~ Recipient of the Hoopes Prize**

*The 2.05 Å Crystal Structure of LptB, An Essential Protein in Gram-Negative Bacterial Outer Membrane Biogenesis*

Professor Daniel Kahne, Laboratory Sponsor

**Mengyuan Marion Liu ~ Recipient of the Hoopes Prize**

*Dissecting the mechanism of double stranded RNA recognition by RIG-I like receptor MDA5*

Professor Sun Hur, Laboratory Sponsor

**Siyuan John Liu ~ Recipient of the Henderson Prize**

*Single Cell Temporal Dynamics and Spatial Reorganization of Oct4 in Mouse Embryonic Stem Cells Reveal Differential Activation of the Pluripotency Circuit During Cell Fate Selection*

Professor Sharad Ramanathan, Laboratory Sponsor

**Victoria Liu**

*Creating Reporters in Human Cell Lines Using Zinc Finger Targeting of Safe Harbor Loci*

Professor Kevin Eggan, Laboratory Sponsor

**Jiajie George Lu**

*Structure-function analysis of sid-1, a gene required for systemic rNA interference in C. elegans*

Professor Craig Hunter, Laboratory Sponsor

**Flora Luo**

*A small molecule iron transport inhibitor stabilizes expression of the human hemochromatosis protein HFE*

Dr. Marianne Wessling-Resnick, Laboratory Sponsor

**Chioma Madubata**

*Development of a Fluorescence Assay to Screen for Small Molecule Modulators of Reactive Oxygen Species Levels in Pancreatic Cells*

Professor Stuart Schreiber, Laboratory Sponsor

**Timothy Maher ~ Recipient of the Hoopes Prize**

*Characterization of the metabolic pathway of a novel lipid family using liquid chromatography-mass spectrometry-based methods*

Professor Alan Saghatelian, Laboratory Sponsor

**Joseph Mandelbaum**

*Cell Autonomous Defects in Myoblasts Expressing Low Levels of Survival of Motor Neuron*

Professor Lee Rubin, Laboratory Sponsor

**Alejandra Marinelarena**

*Dexamethasone as a Regulator of  $\beta$ -cell Maturation*

Dr. Susan Bonner-Weir, Laboratory Sponsor

**Daniel Mark**

*A genome-based approach to identify lipocalins that function as novel mouse pheromones*

Professor Stephen Liberles, Laboratory Sponsor

**Anne McCabe**

*Studying the ion permeation pathway of divalent metal transporter NRAMP using site-directed mutagenesis*

Professor Rachelle Gaudet, Laboratory Sponsor

**Duncan Moore**

*Replication-regulatable oncolytic herpes simplex virus type 1 recombinant viruses for tumor therapy*

Dr. Feng Yao, Laboratory Sponsor

**Adriana Mujal**

*Investigating the Role of a Hematopoietic Collagen Matrix-producing Cell Subset in Lymph Node Tissue Infection and Repair*

Professor Ulrich von Andrian, Laboratory Sponsor

**Nancy Nguyen**

*Genistein increases Heparin expression via the BMP and Stat3 signaling pathways in human hepatocytes*

Dr. Paula Fraenkel, Laboratory Sponsor

**James Pelletier**

*Polymer physics to understand bacterial chromosomes in a wicked small aquarium*

Dr. Suckjoon Jun, Laboratory Sponsor

**Lisa Rotenstein**

*Design of Polyvinyl Alcohol and Alginate Hydrogels for Engineered Endothelial Cell Adhesion*

Professor Debra Auguste, Laboratory Sponsor

**Abigail Schiff**

*The Role of TAK1 in AMPK-mediated eNOS Phosphorylation in the Vascular Endothelium*

Professor Thomas Michel, Laboratory Sponsor

**Eric Shieh**

*Functional Interactions Involving the C-terminus of TRPC6*

Dr. Johannes Schlondorff, Laboratory Sponsor

**Bilal Siddiqui**

*Stabilization of higher-order peptide structure by interhelical hydrocarbon cross-linking to target the oncogene  $\beta$ -catenin*

Professor Greg Verdine, Laboratory Sponsor

**Carol Suh**

*The Role of Bmi1 on Inducing Pluripotent Stem Cells*

Dr. David Scadden, Laboratory Sponsor

**Shervin Tabrizi**

*Genome-wide Detection and Characterization of Recent Natural Selection in Human Populations from the 1000 Genomes Project*

Professor Pardis Sabeti, Laboratory Sponsor

**Anne Taylor**

*Defining the role of c-Myc and N-Myc in the formation and maintenance of Glioblastoma multiforme cancer stem-like cells*

Dr. Hiroaki Wakimoto, Laboratory Sponsor

**Robyn Thom**

*An alternatively spliced isoform of the transcriptional co-activator PGC-1-alpha is uniquely up-regulated in hypoxia and preferentially mediates an angiogenic gene program*

Dr. Zoltan Arany, Laboratory Sponsor

**Horatio Thomas**

*Chemical strategies to investigate peptide interactions with proteins*

Professor Alan Saghatelian, Laboratory Sponsor

**Hanjay Wang**

*Investigating the Oligomeric State of ComEC, a Putative Membrane Channel Essential to Natural Transformation in *Bacillus subtilis**

Professor Briana Burton, Laboratory Sponsor

**Larissa Wenren**

*The role of self-recognition in competition among *Proteus mirabilis* strains*

Professor Karine Gibbs, Laboratory Sponsor

**Eric Wu**

*Role of the SID-1 dsRNA Transport Channel in Coordinating Stress Responses and Cholesterol in *C. elegans**

Professor Craig Hunter, Laboratory Sponsor

**Frances Wu**

*A small molecule screen for neural differentiation*

Professor Lee Rubin, Laboratory Sponsor

**Helen Yang ~ Recipient of the Hoopes Prize**

*Molecular Mechanisms of MeCP2 Function*

Professor Michael Greenberg, Laboratory Sponsor

**Qi Yu**

*Downregulating Phosphatase and Tensin Homolog PTEN in Endothelial Cells:  
Effect on Hydrogen Peroxide Signaling Pathways*

Professor Thomas Michel, Laboratory Sponsor

**Han Angela Zhang**

*Exploring CD8+ Central Memory T Cell Intra-Lymph Node Migration During  
Anti-viral Recall Responses*

Professor Ulrich von Andrian, Laboratory Sponsor