2013 Mol Tox Student Invited Guest Speakers

SPRING QUARTER 2013

April 4

Dr. Lori A. White, PhD
Associate Professor, Department of Biochemistry and Microbiology
School of Env & Biol Sciences, Rutgers University, New Jersey

Molecular mechanisms of xenobiotic-induced pathologies
The focus of her laboratory is to investigate the molecular mechanisms of xenobiotic exposure and to link these molecular changes to xenobiotic-induced pathologies. The polycyclic aromatic hydrocarbon (PAH) 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) is a byproduct of industrial combustion processes. Exposure results in a variety of pathologies in humans, including alterations in the immune and neurological systems, liver dysfunction, and increases in bladder and skin cancer.

April 25

Dr. Robert Tanguay, PhD
Professor, Department of Environmental and Molecular Toxicology
Director of the Sinnhuber Aquatic Research Laboratory
Oregon State University

Harnessing the in vivo power of zebrafish to unraveling complex toxicity mechanisms

Research Interest: Over the past decade he has exploited the molecular and genetic advantages of zebrafish to define the molecular mechanism by which chemicals, drugs and nanoparticles interact with and adversely impact vertebrate development and function. Current projects in the lab are focused on developing and exploiting high throughput in vivo screening for rapid phenotype discovery that are used to anchor mechanistic studies. These efforts are allowing, for the first time, an in vivo glimpse at the inherent toxicity of thousands of chemicals (and mixtures) in a highly relevant vertebrate system. A major focus is on understanding the mechanisms by which early life stage exposures lead to disease, or disease susceptibility later in life. His NIEHS supported Superfund Research Program project is aimed at understating the structural basis for polycyclic aromatic (PAH) toxicity. A major effort is on defining, and predicting, the biological responses produced by structurally diverse Aryl Hydrocarbon Receptor ligands.

May 30

Dr. John E. Casida, PhD
Professor, Toxicology
Department of Nutritional Science and Toxicology, UC Berkeley, California

Pesticide Chemistry and Toxicology, Metabolism and Mode of Action of Organic Toxicants, Insect Biochemistry

Research in the Environmental Chemistry and Toxicology Laboratory emphasizes pesticide mode of action and metabolism. This information is important to optimize
pesticide use, improve their selectivity and environmental characteristics, and minimize the hazards of exposure for humans, domestic animals, and other nontarget species. Recent research involves three closely related topics. The first concerns insecticide action on the nicotinic, GABA and ryanodine receptors with particular attention to characterization of the binding sites in insects and mammals relative to selective action. The second topic characterizes the metabolites, metabolic pathways, and synergist-type inhibitors of pesticide chemical metabolism. Finally, the research attempts to define the secondary effects of pesticide action in mammals leading to adverse toxicology.

May 2

Dr. Xinxin Ding, PhD
Professor of Molecular Genetics, Neuroscience, and Toxicology
Director of Toxicology Track
School of Public Health, State University of New York at Albany,
Chief of the Laboratory of Molecular Toxicology
Wadsworth Center for Laboratories and Research
New York State Department of Health.

Diverse Functions of Microsomal P450 Enzymes

Prof. Xinxin Ding received a Bachelor’s degree in 1982, in Biology, from Nanjing University, Nanjing, China, and a PhD degree in 1988, in Biological Chemistry, from the University of Michigan, Ann Arbor, Michigan, USA. He is currently Professor of Molecular Genetics, Neuroscience, and Toxicology, and Director of Toxicology Track, of the School of Public Health, State University of New York at Albany, and Chief of the Laboratory of Molecular Toxicology, at the Wadsworth Center for Laboratories and Research, New York State Department of Health. Prof. Ding studies the function and regulation of microsomal cytochrome P450 enzymes in various organ systems. A major area of his research involves development and application of genetically engineered mouse models for drug metabolism and toxicology studies. His laboratory also made major contributions to the identification of a human P450, CYP2A13, as an important enzyme for tobacco-related lung carcinogenesis.

Lecture Summary: Microsomal cytochrome P450 monooxygenases have diverse functions in various organ systems, through their metabolism of numerous drugs, chemical carcinogens, environmental pollutants, as well as endogenous signaling molecules. I will describe our efforts to develop novel transgenic and knockout mouse models for determination of the roles of P450 enzymes in the metabolism and tissue-selective toxicity of xenobiotic compounds, and for exploration of their potential biological functions and disease connections.