

2007-2008
Distinguished Scholars in Toxicology
Lecture Series

Hosted by
The Center for Integrative Toxicology
In cooperation with
The Department of Biochemistry and Molecular Biology

Thursday, December 13, 2007

Timothy Ryan, Ph.D.
Lilly Research Laboratories

**“Leveraging Gene Expression Data
in Pharmacology and Toxicology:
Functional Genomics in Drug Discovery”**

Thursday, February 14, 2007
Joel Pounds, Ph.D.
Pacific Northwest National Laboratory

11 a.m.

1415 Biomedical and Physical Sciences

Ryan Lecture Abstract

Promises that toxicogenomics would revolutionize drug development were commonplace in the early years of microarray research. In practice, however, we have found genomic technologies to complement the traditional drug development process, providing an unprecedented view into modes of toxicity with granularity that has been previously unattainable.

Niche applications of microarray, cellular, and informatic technologies are key in finding biomarkers and elucidating mechanisms of candidate drug toxicity that, in turn, result in better screening paradigms to help circumvent toxicity issues. When combined with knockdown, overexpression, and murine knockout strategies, the information coming from exploring toxicity mechanisms offers new insight, demonstrating overlaps between target biology and toxicology.

Interestingly, we have identified novel targets and approaches to disease based on what we have learned from our toxicology studies. As an example, the research results in the field of nuclear hormone receptor biology, such as the recently deorphanized receptor LXR, will be discussed.

Applying functional genomics in toxicology, and subsequently into early target identification, will be the focus of this talk, with illustrations of how our genomic findings are impacting early drug discovery efforts. Although not revolutionary, toxicogenomics is indeed changing the mindset of the pharmaceutical biologist and bettering our ability to more intelligently discover and develop drugs.

Biographical Information

Dr. Timothy Ryan is a Senior Research Advisor in the Department of Integrative Biology at Lilly Research Laboratories. Dr. Ryan received his undergraduate degree in Biochemistry from Michigan State University in 1987 and his doctorate in Molecular Biology and Toxicology from the Biotechnology Center at Utah State University in 1991 under the direction of Dr. Steven Aust. Postdoctoral training was obtained at Pharmacia & Upjohn in the Department of Investigative Toxicology prior to his appointment in CNS drug discovery at AstraZeneca Pharmaceuticals. Dr. Ryan joined Lilly in 1999, and his laboratories have focused upon leveraging genomic technologies, identifying and validating new drug targets, biomarkers, and elucidating mechanisms of pharmacology/toxicity in the early phases of drug development. Dr. Ryan's presentation will use case studies to illustrate how these technologies can be applied to better develop drugs.

