

Genome-wide association approach to drug-induced torsades de pointes.

Courtesy of Dr. Dan Roden.

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medicine.mc.vanderbilt.edu/clinicalpharmacology

Fellowship in Clinical Pharmacology

TRANSLATIONAL SCIENCE



CLINICAL PHARMACOLOGY

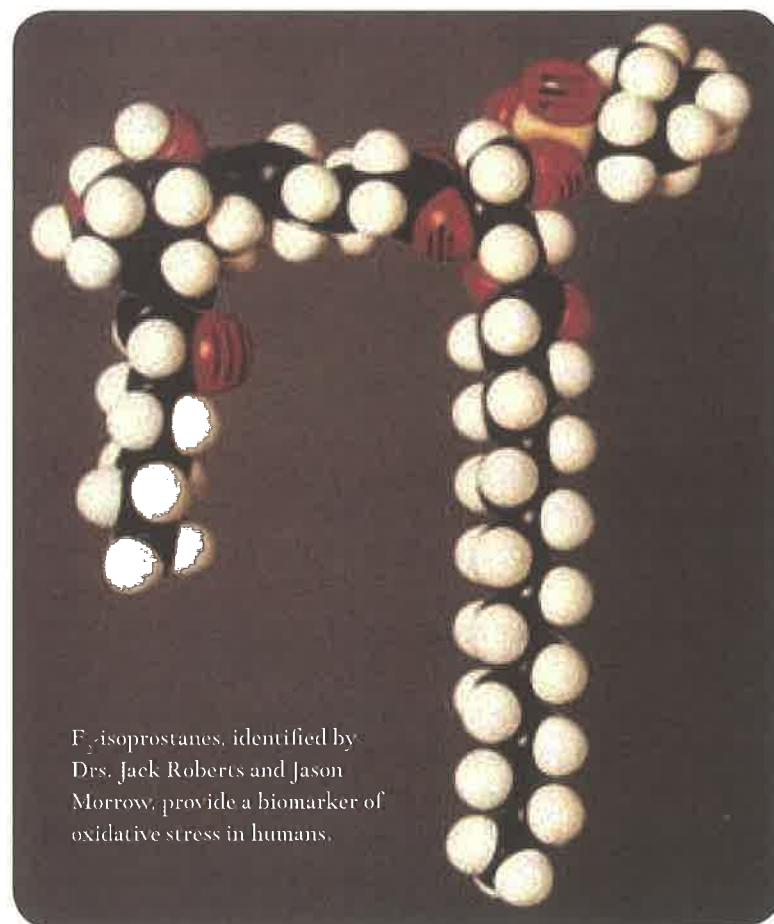
Eighty-two percent of adults in the United States take at least one medication, including prescription and nonprescription drugs and vitamins and supplements. The scientific mission of the Vanderbilt Division of Clinical Pharmacology is to understand how drugs act in order to improve therapeutics. This provides the basis for “Personalized Medicine,” or “giving the right drug to the right person at the right time.”

Faculty members in the Division include members of the Oates Institute for Experimental Therapeutics and the Vanderbilt Bone Center. Investigators within the Division collaborate with investigators in Pharmacology, Biochemistry (including Molecular Toxicology), Chemistry, Molecular Physiology, Vanderbilt Institute of Chemical Biology, the Cancer Center, as well as with clinical and basic scientists in other divisions of the Department of Medicine.

Research in the Division bridges basic pharmacology and the clinical sciences. Major research expertise focuses on:

- Pharmacogenetics and drug disposition and metabolism: Personalized Medicine
- Pharmacology of eicosanoids and oxidative stress
- Ion channel pharmacology and arrhythmia pharmacogenomics
- Human cardiovascular pharmacology and autonomic dysfunction
- Bone and cancer pharmacology
- Pharmacoepidemiology

The scientific mission is to understand how drugs act in order to improve therapeutics



THE FELLOWSHIP PROGRAM

The primary goal of the fellowship is to provide trainees with experience in contemporary research in clinical pharmacology under the mentorship of an individual faculty preceptor. This comprises 80% of the training period. In addition, fellows participate in a core curriculum, in order to gain exposure to a broader range of fundamental principles important to the discipline of Clinical Pharmacology and the evaluation of drug actions in humans.

Key skills and knowledge include:

- Biostatistics and study design
- Pharmacogenetics
- Drug regulation and development
- Pharmacokinetics and pharmacodynamics
- Biomarkers and drug analytic methods
- Molecular pharmacology
- Drug effects and disposition
- Drug safety
- Toxicology and poisoning
- Research ethics and IRB processes
- Writing and Reviewing a paper
- Data presentation and teaching skills
- Grant writing and strategy
- Career planning

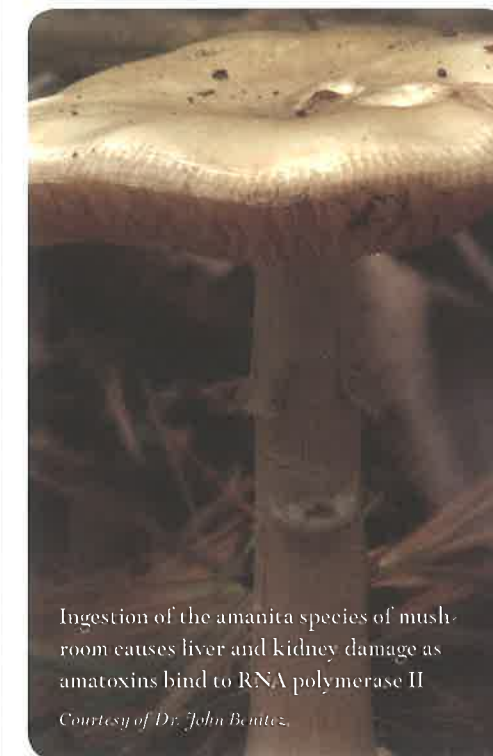
A small number of trainees, interested in delving into some of these topics in more depth, may choose to enroll in the Master of Science in Clinical Investigation (www.mc.vanderbilt.edu/msci).

The training period requires at least two years. Those who enroll in the MSCI typically require 3 years. Some physician-scientists combine their two-year research fellowship in clinical pharmacology with subspecialty clinical training to meet the categorical subspecialty fellowship requirements. Our training program is registered with the American Board of Clinical Pharmacology and thus qualified trainees are eligible to sit for the board exam.

APPLICATION PROCESS

The Division uses a rolling admission process. Interested MD-, PhD-, or PharmD-trained applicants should send a CV and letter of interest to Fellowship Program Director, Dr. C. Michael Stein at: Michael.stein@vanderbilt.edu. Dr. Stein's office will contact qualified applicants to set up an interview and to obtain references.

Trainees meet first with the Division Director (Dr. David G. Harrison) and the Associate Director and Fellowship Director (Dr. Mike Stein) in order to discuss their interests and the research interests of investigators in the Division, and subsequently with faculty members of the Division. The purpose of these meetings is to determine the appropriateness of the candidate, but also, to enable prospective fellows to choose a mentor and research project. Prior research is not a requirement, but there should be some evidence of a commitment to research.



Alumni from the Division:

- Pursue careers in academic medicine
- Become national leaders in clinical, translational, and basic science
- Serve in senior positions in industry and the Food and Drug Administration

VANDERBILT CLINICAL PHARMACOLOGY DISCOVERY TIME LINE

1960 John Oates describes one of the early, important anti-hypertensive drugs that became alpha-methyl-dopa (Aldomet).

1973 Grant Wilkinson and David Shand describe first-pass metabolism, a common feature for the processing of many drugs.

1981 Rose Robertson, John Oates, and colleagues describe the relationship between thromboxane A₂ and coronary vasospasm.

1997 Nancy Brown, Marie Griffin, and Wayne Ray identify risk factors for ACE inhibitor-associated angioedema.

1998 Nancy Brown, Jason Morrow, and Jay Gainer demonstrate that bradykinin contributes to the short-term effects of ACE inhibition on blood pressure.

2001 Mike Stein and Alastair Wood define the effect of genetic variation on agonist-mediated vascular beta₁-adrenergic receptor desensitization.

2002 Jeff Balsler, Dan Roden, Mark Anderson, and colleagues identify a calcium sensor in the sodium channel that modulates cardiac excitability.

2008 Mike Stein, Dan Roden and Ute Schwartz identify genetic determinants of the initial response to warfarin.

2008 John Oates and David Adler describe a patient with inherited phospholipase A₂ deficiency characterized by impaired eicosanoid biosynthesis, small intestinal ulceration.

2009 Kathy Murray and Mike Stein, together with Wayne Ray and colleagues, report the effect of anti-psychotic medications on the risk of sudden death.

2010 Dan Roden, Dawood Darbar and others identify genetic variants contributing to cardiac arrhythmias.

