ABOUT ELAINE SANDERS-BUSH

Born and raised on a small farm in Kentucky, Elaine Sanders attended Western Kentucky University. Upon graduation in 1962, she joined the graduate program in Pharmacology at Vanderbilt University and earned the Ph.D. degree in 1967. After postdoctoral training, she joined the Vanderbilt faculty in 1969 and was promoted to Professor of Pharmacology in 1980. In 2002, she was appointed the first Director of the Vanderbilt Brain Institute. Her research has made major contributions to the understanding of serotonin and its receptors, from pharmacology and signal transduction to in vivo brain function. Over time, her research evolved to take advantage of the tremendous advances that were offered in molecular biology, genetics and behavior. Her research accomplishments have brought her broad recognition, including uninterrupted funding from NIH throughout her career. Other awards include the Bristol-Myers Squibb Award for Neuroscience Research and a MERIT Award from National Institute of Mental Health. In 2006, she was named the Harvey Branscomb Distinguished Professor at Vanderbilt and was elected President of the American Society for Pharmacology and Experimental Therapeutics. Sanders-Bush has been a leader in development of neuroscience research and graduate education at Vanderbilt. In 1997, she spearheaded the creation of a new Ph.D. degree program in Neuroscience and served as Director until 2008. The program was remarkably successful, growing to an enrollment of 60 graduate students by the end of the first decade. Sanders-Bush has a strong track record of training students who think both creatively and critically. Driven by a deep personal commitment to increasing diversity in scientific research, Sanders-Bush has worked to enhance minority training programs at Tennessee State University, Meharry Medical College, and Vanderbilt. In recognition of her commitment and accomplishments, she was the first recipient of Vanderbilt's Levi Watkins, Jr. Award for Leadership Diversity in 2002 and, in 2009, the Dr. Delores C. Shockley Lecture and Partnership Award.

Upcoming Discovery Lecture:

SALLY E. SHAYWITZ, M.D. *and* BENNETT A. SHAYWITZ, M.D.
Yale University

April 17, 2014
208 Light Hall / 4:00 P.M.

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DAVID E. CLAPHAM, M.D., Ph.D.

CILIARY ION CHANNELS AND HEDGEHOG SIGNALING

APRIL 3, 2014
3:00 P.M.
208 LIGHT HALL

VANDERBILT UNIVERSITY
MEDICAL CENTER

CILIARY ION CHANNELS AND HEDGEHOG SIGNALING

Primary cilia are solitary nonmotile extensions of the centriole found on nearly all nucleated eukaryotic cells between cell divisions. Only ~200-300 nm in diameter and a few microns long, they are separated from the cytoplasm by the ciliary neck and basal body. Often called sensory cilia, they are hypothesized to receive chemical and mechanical stimuli and initiate specific cellular signal transduction pathways. When activated by a ligand, Hedgehog (Hh) pathway proteins, such as Gli2 and Smoothened (Smo), translocate from the cell into the cilium. The ionic conditions, permeability of the primary cilia membrane, and effectiveness of the diffusion barriers between the cilia and cell body are unknown. Here we show that cilia are a unique calcium compartment regulated by a heteromeric TRP channel, PKD1-L1/PKD2-L1. We show that changes in ciliary calcium concentration ($[Ca^{2+}]_{cilia}$) occur without substantially altering global cytoplasmic calcium ($[Ca^{2+}]_{cyto}$). PKD1-L1/PKD2-L1 acts as a ciliary calcium channel controlling $[Ca^{2+}]_{cilia}$ and thereby modifying Smo-activated Gli2 translocation and Gli1 expression.

DAVID E. CLAPHAM, M.D., Ph.D.

HOWARD HUGHES MEDICAL INSTITUTE
DEPARTMENT OF CARDIOLOGY, CHILDREN'S HOSPITAL
DEPARTMENT OF NEUROBIOLOGY, HARVARD MEDICAL SCHOOL

David Clapham M.D., Ph.D., is the Aldo R. Castañeda Professor of Cardiovascular Research, Professor of Pediatrics and Professor of Neurobiology at Harvard Medical School, and Director of Cardiovascular Research at Boston Children's Hospital. He is an Investigator of the Howard Hughes Medical Institute and funded by grants from the NIH and the Gates Foundation. A graduate of the Georgia Institute of Technology in electrical engineering, he completed his MD and PhD degrees at Emory University. His residency in internal medicine was completed at Brigham and Women's Hospital in Boston, and his postdoctoral fellowship was with Dr. Erwin Neher at the Max Planck Institute in Göttingen, Germany. He has received the Basic Science Award from the American Heart Association, the Cole Award from the Biophysical Society, a Glaxo Cardiovascular Discovery Award, an Established Investigator Award from the American Heart Association, an American Society of Clinical Investigation Award for Research and Contributions to the Biomedical Community, and received the Bristol Myers Squibb Award for Distinguished Achievement in Cardiovascular Research, and the Harvard Medical School William Silen Lifetime Achievement in Mentoring Award. He is a fellow of the American Association for the Advancement of Science, the American Academy of Arts and Sciences, and the National Academy of Science.