

The R. Gaurth Hansen Seminar Series

The Hansen Seminars honor the memory of R. Gaurth Hansen, a respected biochemist, who devoted much of his career to the improvement of Utah State University. Dr. Hansen was born in Cache Valley, the site of USU, in 1920. He attended the University of Wisconsin where he earned his BS in chemistry, and MS and PhD degrees in biochemistry.

Dr. Hansen spent two years as an Assistant Professor at the University of Utah, College of Medicine followed by seven years as Associate Professor in the Biochemistry Department of the University of Illinois. In 1957, he moved to Michigan State University where he served eleven years as Chairman of the Biochemistry Department. Dr. Hansen returned to Cache Valley and Utah State University in 1968 where he served for sixteen years as Academic Vice President, and Distinguished Professor of Nutrition and Food Sciences and Chemistry & Biochemistry. He was instrumental in improving the instruction and research activities of the University, and presided over a twenty-fold increase in the University's research budget. Dr. Hansen became USU Distinguished Professor Emeritus in 1985.

During his career, Dr. Hansen published more than 100 articles in professional journals and more than 20 books and book chapters. He was a Fellow of the American Institute of Nutrition, received the Sesquicentennial Award from the University of Michigan, received the Borden Award from the American Institute of Nutrition, and was a Resident Scholar at the Rockefeller Study and Conference Center in Bellagio, Italy. He served his country on the Food and Nutrition Board, the American Medical Association Council on Foods and Nutrition, the National Nutritional Consortium. He further Chaired a Nutrition Study Section of the US Public Health Service, acted as Consultant to the Army Medical Research and Development Command and to the Interdepartmental Committee on Nutrition for National Defense. Dr. Hansen had vast international experience as a consultant to the US Public Health Service and Kellogg Foundation, wherein he reviewed health and nutrition status in Turkey, Ecuador, Thailand, Venezuela, Nigeria, Costa Rica, Colombia, and Brazil.

Dr. Hansen married Anna Lou Rees in 1943 and they had three children together: Roger, Ted, and Lars.

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The R. Gaurth Hansen Seminar Series

2018 Lecturer



Dr. Michael Marletta, CH and Annie Li
Chair in the Molecular Biology of Diseases
Professor of Chemistry
Professor of Molecular and Cell Biology
University of California, Berkeley, CA

“Nitric Oxide in Biology: From Prokaryotes
to Humans”

4:00 P.M. Wednesday, October 24, 2018
Eccles Science Learning Center Rm 046
Department of Chemistry & Biochemistry
Utah State University, Logan, Utah

Abstract

The discovery of nitric oxide (NO) function in biology was a surprise, given the toxicity of the molecule. The principal discoveries emerged from two disparate fields of investigation, one focused on blood vessel dilation and the other on immune system function. Since the discovery, it has become clear that this toxic, free radical, diatomic gas plays an important role in cellular function in both prokaryotes and eukaryotes. NO acts as a signaling agent in the cardiovascular system and other tissues. Using a low concentration of NO mitigates the toxicity problem but places a difficult chemical requirement on the NO receptor, the soluble isoform of guanylate cyclase (sGC). sGC contains a heme cofactor that binds and traps NO, thereby activating the enzyme to convert GTP to cGMP. The heme in sGC has unique ligand binding properties enabling sGC to act as a selective receptor for NO. The heme domain of sGC was found to be part of the H-NOX (Heme-Nitric oxide/Oxygen) family of proteins with homologues in both aerobic and anaerobic prokaryotes. Studies with H-NOX proteins has provided a molecular explanation for selective NO trapping at low concentrations. The structure/function picture that is emerging provides new clues to the activation mechanism. As a physiological model is developed it must also account for activity properties of stimulators such as the FDA-approved Adempas®.

Dr. Marletta's primary research interests lie at the interface of chemistry and biology with emphasis on the study of protein function and enzyme reaction mechanisms. He is recognized internationally for his seminal contributions to understanding the ability of mammals to synthesize and respond to nitric oxide. He has uncovered several novel

structure/function relationships in nitric oxide synthase, guanylate cyclase and bacterial NO sensing proteins. His continued studies on NO signaling have recently led to a molecular understanding of general gas sensing mechanisms in biology. A new research direction involves novel oxidative enzymology of cellulose degradation with application to biofuel production.

Dr. Marletta is a recipient of the MacArthur Foundation Fellowship (the "Genius Grant"), and the Repligen Award from the Division of Biological Chemistry of the American Chemical Society, the Alfred Bader Award in Bioinorganic or Bioorganic Chemistry, and the Emil Thomas Kaiser Award of the Protein Society. He was an Investigator in the Howard Hughes Medical Institute and has been elected to the American Academy of Arts and Sciences, the National Academy of Sciences, the National Academy of Medicine, and the National Academy of Inventors.

He earned an A.B. degree in biology and chemistry from Fredonia, State University of New York and a Ph.D. in pharmaceutical chemistry from the University of California, San Francisco.

Previous Hansen Symposium Speakers

Professor William Lipscomb	2003
Professor JoAnne Stubbe	2004
Professor Judith Klinman	2005
Professor Paul Ludden	2006
Professor Jane Richardson	2007
Professor Hector DeLuca	2008
Professor Scott Strobel	2009
Professor F. Robert Tabita	2011
Professor Anna Marie Pyle	2012
Professor Stephen Kowalczykowski	2013
Professor Sabeeha Merchant	2015
Professor Lorena Beese	2016
Professor Scott Strobel	2017
Professor Wesley Sundquist	2018