

Melvin Ernest Andersen, Ph.D.



Melvin Ernest Andersen, Ph.D. is the director of the Computational Biology Division; director of the Long Range Research Initiative of the American Chemistry Council; and senior science advisor of the Center for Human Health Assessment at CIIT at The Hamner Institutes for Health Sciences, located in Research Triangle Park, North Carolina. Dr. Andersen guides research directions, mentors staff and ensures the adequate reporting of results at The Hamner. As director of the Computational Biology Division, he imparts a computational systems biology emphasis to dose-response assessments for the health effects of environmental chemicals. The systems biology approach is characterised by an iterative cycle of theory, computational modelling and experimentation to quantitatively describe cells or cell processes. His current research interests include the development of mathematical descriptions of control of cellular circuitry and the dose response and risk assessment implications of perturbations of these circuits.

Dr. Andersen's career contributions include developing biologically realistic models of the uptake, distribution, metabolism, and biological effects of drugs and toxic chemicals, as well as the application of these models in safety assessments and quantitative health risk assessments. He is recognized for developing short courses and computer demonstrations in both pharmacokinetic and pharmacodynamic modeling. Pharmacokinetics is the study of the fate of drugs and chemicals in the body over a period of time, including the processes of absorption, distribution, localization in tissues, biotransformation and excretion. Pharmacodynamics is the study of the biochemical and physiological effects of drugs and chemicals on the body. It can therefore be said that pharmacokinetics is what the body does to a drug or chemical, while pharmacodynamics, on the other hand, is what the chemical does to the body.

The results of Dr. Andersen's research have implications for the Occupational Safety and Health Administration's (OSHA's) establishment of Permissible Exposure Limits or PELs, which are legal limits for employee exposure to substances such as chemicals. In guidelines for the general population, Dr. Andersen's work has helped the U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA) derive the reference doses/reference concentrations (RfDs/RfCs) of contaminants of concern at hazardous waste sites, for example. The major thrust of Dr. Andersen's research concerns the regulation of chemicals in the environment.

Board certified in industrial hygiene and in toxicology, Dr. Andersen is a fellow of the Academy of Toxicological Sciences. He has served on the editorial boards of numerous scholarly journals, including: *Journal of Children's Health, Food and Chemical Toxicology, Toxicology and Applied Pharmacology, Inhalation Toxicology, Human and Experimental Toxicology, and Human and Ecological Risk Assessment*. Dr. Andersen has been associate editor of *Toxicology and Applied Pharmacology*. An author or co-author of 300 papers, 45 book chapters and numerous reports and abstracts, Dr. Andersen has received several awards for professional contributions, including the Herbert Stokinger Award from the American Conference of Industrial Hygienists, the Kenneth Morgareidge Award from the International Life Sciences Institute, the George Scott Award from Toxicology Forum, and the Frank R. Blood and the Achievement Awards from the Society of Toxicology. In 2002, Dr. Andersen was recognized as a "highly cited" scientist by the Institute for Scientific Information, and in 2004, he received the Arnold J. Lehman Award from the Society of Toxicology for contributions in Risk Assessment.

From 1999 to 2002, Dr. Andersen was professor of environmental health at Colorado State University in Fort Collins, Colorado. Prior to that, he served as vice president of the K.S. Crump Group of ICF Kaiser International Consulting. He has held positions in toxicology research and research management in the federal government with the Department of Defense (DoD) and the EPA, as well as in private industry with the Chemical Industry Institute of Toxicology. Dr. Andersen earned his Sc.B. in chemistry at Brown University in Providence, Rhode Island in 1967 and his Ph.D. in biochemistry and molecular biology at

Cornell University in Ithaca, New York, in 1971. He is a Diplomat of the American Board of Toxicology and holds Certificate No. 1331 from Comprehensive Practice of Industrial Hygiene. Among the professional memberships Dr. Andersen maintains are the Society of Toxicology, the American Academy of Industrial Hygiene, the American Conference of Governmental Industrial Hygienists and the Society of Risk Analysis.