



American Society for Investigative Pathology

Investigating the Mechanisms of Disease

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Donald E. Ingber MD, PhD, Receives the ASIP 2010 Gold Headed Cane Award



Dr. Donald Ingber is the 2010 recipient of the Rous-Whipple award, which is presented to a senior scientist with a distinguished career in research who has advanced the understanding of disease and has continued productivity at the time of the award.

Dr. Ingber's research career is focused on the general mechanisms of cell and developmental regulation and is specifically focused on control of angiogenesis and vascular development. His research approach has been driven by the hypothesis that the process of tissue construction may be regulated mechanically. He introduced the concept that living cells stabilize their internal cytoskeleton, and control their shape and mechanics, using an architectural system first described by Buckminster Fuller, known as "tensegrity." Dr. Ingber has combined the use of techniques from various

fields, including molecular cell biology, mechanical engineering, physics, chemistry, and computer science to identify mechanical forces and the cytoskeleton as critical cell and developmental regulators. He discovered that transmembrane integrin receptors that anchor cells to extracellular matrix also mediate mechanotransduction. Extracellular matrix and cell shape distortion play central roles in control of angiogenesis that is required for tumor growth and expansion. Dr. Ingber has developed numerous novel microtechnologies, nanotechnologies, magnetic control systems and computational models in the course of pursuing these studies. Their potential applications are currently being explored in areas ranging from ultra-sensitive clinical diagnostics to nanoscale medical devices, engineered tissues, and biologically-inspired materials for tissue repair and reconstruction.

Dr. Frederick J. Schoen of Harvard Medical School and Brigham and Women's Hospital describes Dr. Ingber as "among the most innovative and original thinkers I have encountered in my 38-year professional career." He also states that Dr. Ingber's research results "have been paradigm-shifting and have widespread implications for control of tissue physiology and potentially development of new therapeutic modalities for diseases, such as hypertension and cancer."

"Perhaps the largest reason Dr. Ingber has been so successful is his uncanny ability to apply sophisticated concepts from the physical sciences and engineering to study problems in biology and pathology," according to Dr. Michael Klagsbrun and Dr. Marsha A. Moses of Harvard Medical School and Children's Hospital Boston. In addition, they added that "One of the most convincing measures of Dr. Ingber's lasting impact on science and medicine is the record of his trainees." Dr. Ingber has been involved in the training of 15 current faculty members at some of the top institutions in the world.

Dr. Ingber received MD and PhD degrees from Yale University in 1984 and is currently the Judah Folkman Professor of Vascular Biology at Children's Hospital Boston and Harvard Medical School,

Professor of Bioengineering at Harvard University School of Engineering and Applied Sciences, and the Director of Harvard's Institute for Biologically Inspired Engineering.

Dr. Ingber presented his award lecture on "Mechanobiology and Diseases of Mechanotransduction" on Sunday, April 25, 2010 at the ASIP Annual Meeting in Anaheim, CA and received the Rous-Whipple Award at the ASIP Awards and Business Meeting on Monday, April 26, 2010.