

# Dr. Leroy Hood, biotechnology inventor, visionary, and pioneer of the proactive “P4 medicine” approach

*Recipient of BioMed SA’s 2011 Julio Palmaz Award for Innovation in Healthcare and the Biosciences*



**Leroy Hood, MD, Ph.D, President & Co-founder  
Institute for Systems Biology, Seattle, Washington**

## **Selection Committee rationale:**

Dr. Hood’s pioneering work in developing tools and approaches that have revolutionized molecular biology, genomics, and medicine made him a standout choice for this year’s award. A member of all three National Academies, he founded the core companies and technologies on which the field of biotechnology rests. He is a visionary advocate for interdisciplinary research and for a transformative approach to clinical care that is predictive, preventative, personalized, and participatory. We were also impressed by his strong belief in and practice of collaboration, which we consider to be a hallmark of San Antonio’s biomedical community as well. – *Dr. Robert Gracy, 2011 Palmaz Committee Chair*

Dr. Leroy Hood is a world-renowned biotechnology inventor and visionary, whose discoveries have permanently changed the course of biology and revolutionized the understanding of genetics, life, and human health. He created the technological foundation for the sciences of genomics (study of genes) and proteomics (study of proteins) through his invention of five groundbreaking instruments and through his pioneering of the fields of systems biology and systems medicine.

His first two instruments, the protein sequencer and protein synthesizer, allowed scientists to characterize a series of new proteins whose genes could then be cloned and analyzed. These were followed by the DNA synthesizer, the first of three instruments for genomic analyses. Most notably, the automated DNA sequencer he developed in 1986 made possible high-speed sequencing of human genomes and was the key technology enabling the Human Genome Project. In the early 1990s, he and his colleagues went on to develop the ink-jet DNA synthesis technology for creating DNA arrays with tens of thousands of gene fragments, one of the first of the so-called DNA chips. The first four instruments were commercialized by Applied Biosystems, Inc., a company Dr. Hood founded in 1981, and the ink-jet technology was commercialized by Agilent Technologies, making these tools immediately available to scientists around the world.

In 2000, Dr. Hood co-founded the Institute for Systems Biology (ISB), a nonprofit research institute to address the greatest challenge of 21st century science – understanding biological complexity. Since its founding, the ISB has been a pioneering source of knowledge, technologies, and computational tools, as well as creative ways of understanding, conducting, and communicating science. Together these endeavors are catalyzing paradigm changes in how the life sciences and medicine are practiced globally and generating results that can be applied to some of society’s most perplexing problems in human health and environmental sustainability.

Most recently, Dr. Hood’s efforts have led him to introduce a new approach he calls “P4 medicine,” which he believes will transform the practice of medicine, moving it from a largely reactive discipline to a proactive one that will enable researchers to quantify wellness and demystify disease.

Dr. Hood is a member of all three U.S. National Academies: the National Academy of Engineering, the National Academy of Sciences, and the Institute of Medicine. He was awarded the Lasker Prize in 1987, the 2002 Kyoto Prize in Advanced Technology, the 2003 Lemelson-MIT Prize for Innovation and Invention, the 2005 Heinz Award for Technology, the Economy and Employment, and the Fritz J. and Dolores H. Russ Prize in 2011 and was inducted into the National Inventors Hall of Fame in 2007. He has also played a key role in founding more than 13 biotechnology companies, including Amgen, Applied Biosystems, Systemix, Darwin, Rosetta, and Integrated Diagnostics.