GRANDE CONFÉRENCE 22 DE LA MISSION CULTURE SCIENTIFIQUE ET TECHNIQUE

Systems biology, systems medicine and strategic partnerships

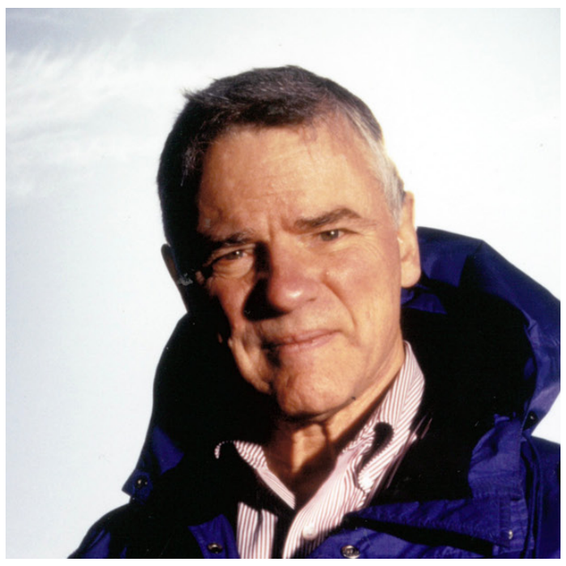
Leroy Hood Insitute for Systems Biology, Seattle

Friday 03 December 2010 16:00

Lecture hall BS1.03 Campus Limpertsberg

The challenge for biology and medicine in the 21st century is the need to deal with its incredible complexity. One powerful way to think of biology/medicine is to view them as informational sciences requiring systems approaches. Systems approaches are holistic rather than atomistic, and employ both hypothesis-driven as well as discovery-driven approaches. Hence the challenge in understanding biological complexity is that of using systems approaches to deciphering the operation of dynamic biological networks across three time scales of life: development, physiological and disease responses. I will focus on our efforts at a systems approach to disease, looking at prion disease in mice. I will also discuss the emerging technologies that will transform medicine over the next 10 years, including next generation DNA sequencing, microfluidic protein chips, single-cell analyses and the capacity to generate stem cells for each individual patient. It appears that systems medicine, emerging technologies and powerful new computational and mathematical tools will transform medicine over the next 5-20 years from its currently reactive state to a mode that is proactive (P4) medicine that is predictive, personalized, preventive and participatory. P4 medicine will have striking implications for healthcare costs as well as leading to a transformation of the healthcare industry. I will also talk about key ISB strategic partnerships, including that with Luxembourg, which will facilitate bringing P4 medicine to the patient.

Leroy Hood *holds an M.D. from the Johns Hopkins School of Medicine in Baltimore and a Ph.D. in biochemistry from the California Institute of Technology. He was a senior scientist at the National Cancer Institute before being appointed as a professor of biology at Caltech in 1970. In 1992 he moved to Seattle founding the Department of Molecular Biotechnology at the University of Washington. In 2000 he co-founded the Institute of Systems Biology in Seattle of which he is the president. He has been the recipient of many prestigious honors over the years including the Lasker Prize (1987), the Kyoto Prize (2000), and the Kistler Prize, awarded for increasing the knowledge and understanding of the relationship between the human genome and society (2010). He has received 17 honorary degrees, has published more than 700 peer-reviewed papers and was granted 26 patents. He is one of only seven scientists elected to the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine. Leroy Hood was appointed as Invited Professor at the University of Luxembourg in 2010.*



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