

**Title: From Peas (Genetics) to Disease (Systems Biology): Medicine Transformed as an Information Science**

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**Abstract:**

A revolution is underway that is shifting the focus of health care from treatment of disease to diagnosis and prevention. This revolution is based on an integration of genetics, genomics and biology that has led to new field called systems biology and medicine, and that is transforming medicine to an information science. This revolution is enabled with breakthroughs in technologies and computer sciences that are together leading to an incredible increase in complex information, over time, for millions of individuals. This information must be accessed, analyzed and interpreted in real time to provide effective proactive health care. Analysis of this information, together with parallel studies in model organisms, is creating a deep understanding of the function of biological systems as well as discovery of new ways to maintain health. I will summarize the key elements of this ongoing revolution, and will provide examples of the ways in which an understanding of genetics, systems biology and information sciences can be used to prevent diseases such as cancer and obesity.

**About the speaker:**

Joseph Nadeau is formerly James H. Jewel Professor and Chair of Genetics Department at Case Western Reserve University School of Medicine. He was a founding member of the International Mammalian Genome Society and a founding editor of Mammalian Genome and of Systems Biology and Medicine. He was founder and director of the Mouse Genome Informatics Project and founder of the Mouse Gene Expression Database Project. He has served on review panels and advisory groups at the National Institutes of Health, the National Science Foundation and the Human Genome Database, and has consulted for several biotech and major pharmaceutical companies. His research interests include cancer, metabolic disease and development, with an emphasis on genetic, genomic, computational, bioinformatics, and systems studies of mouse models of human disease. He has won several awards for his work, is an Elected Fellow of the American Association for the Advancement of Science, and was recently recognized with a Pioneer Award from the National Institutes of Health. He is currently Director of Research and Academic Affairs at the Institute for Systems Biology.