

Healthcare of the Future – P4 Medicine

Healthcare is on the verge of a major revolution - one that will be catalyzed by a new systems-based approach to health and disease and that will trigger the emergence of medicine that is **predictive, preventive, personalized, and participatory - P4 Medicine**. The enabling forces of P4 Medicine are the recent and emerging fruits of science and the exploding knowledge base derived from our accelerated understanding of the human genome and complex systems.

Utilizing an individual's genomic, proteomic, and molecular diagnostic information, P4 Medicine will provide new ways to maintain health and quantify wellness, diagnose illness, and predict disease. P4 Medicine will be distinguished from today's healthcare system by its novel approach to diagnostics, therapeutics, and the prevention of illness. These advances will lead to a shift of health services to become more proactive, specific, effective, efficient, and patient-centric.

As the healthcare landscape transforms due to this new science and systems-based approach, and as the healthcare system moves towards P4 Medicine, it is inevitable that our operating assumptions around discovery, detection, treatment, and payment for health services will also change. The resultant market opportunities will likely be accompanied by new challenges for our traditional ethical and social constructs. In short, the arrival of P4 Medicine will touch all of our lives in new and exciting ways.

Change of this nature does not come without challenge. This new order requires a realignment of historical boundaries among stakeholders to eliminate barriers impeding its realization. For this reason we have created the P4 Medicine Institute, to help chart and realize this future.

P4 Medicine Institute

Leading the way in bringing a new paradigm of
healthcare to patients

The P4 Medicine Institute (P4MI) is a Seattle based non-profit *innovation consortium* of leading edge stakeholders that was established in 2010 to lead the emergence and adoption of P4 Medicine. P4MI's goal is to apply systems biology and systems theory to medicine and care delivery to revolutionize healthcare from a reactive state to one that predicts and prevents illness, focuses on health & wellness, and considers the consumer as the central figure in care.

P4MI will develop a new care delivery model that blends leading-edge science, technology innovation, clinical research, healthcare delivery expertise, and medical access to patients; engages payers, providers, and industry in participatory medicine; and advocates for policies that address the societal and legal implications of P4 Medicine.

Founded: 2010

Founding Members:

Institute for Systems Biology
Ohio State University

Headquarters: Seattle, Washington

Executive Director: Frederick Lee MD, MPH

P4 Medicine:

The term "P4 Medicine" was coined in 2003 by biotechnology visionary Dr. Leroy Hood, Co-founder and President of the Institute for Systems Biology and Chairman of the P4MI board.



A focus on keeping people healthy in a predictive, preventive, personalized, and participatory manner

Predictive

Through the use of predictive genomics and molecular biomarkers, the consumer will be alerted to the risk of disease before it fully manifests.

Systems biology considers health status to be the interaction between information in the genome and information from the environment. This ongoing interaction is mediated by biologic networks that become perturbed on the path to illness. Biomarker-based analysis of these perturbed networks, coupled with predictive analysis of the genome, will give providers and individuals early warning of the onset of illness.

Preventive

Highly precise and effective therapies can be administered that will prevent illness before symptoms arise.

Characterization of the sequentially perturbed molecular networks that result in disease will also allow therapies to be developed that can arrest the progression to full illness and keep the individual healthy. Drugs developed in this way will be more effective and have fewer side effects than medicines of today.

Personalized

Each individual will have diagnosis and treatment tailored to their own unique molecular profile.

As 'clouds' of digitized longitudinal health data emerge around the individual, advanced informatics will be able to mine this data and define individualized biosignatures. By capturing these molecular patterns for both healthy and the ill states, each consumer will become his or her own 'control.' The notion of 'one size fits all' medicine will be dispelled with the ability to characterize each consumer uniquely.

Participatory

The passive patient will be transformed into the informed, engaged consumer who takes ownership of his or her own health. Healthcare will become enjoyable, actionable, and effective.

As applying systems approaches to biology is yielding remarkable insights and benefits, so will applying systems approaches to care delivery. Providers will become educated in new models that place the consumer at the center of care process, and delivery will become elegantly integrated into our daily lives. Care will be fun and engaging for the consumer, resulting in increased satisfaction and ownership of health and health decisions