Actualizing 21st Century Biomedicine

Considerable momentum has been building in government, academe and the commercial sector towards implementation of a "rapid-learning health system". In this approach to biomedicine, research and clinical care are seamlessly linked in a virtuous circle that enables the collection and analysis of information on clinical outcomes of large populations to measure what is effective, and applies that knowledge to drive discovery and clinical development of new products which in turn are measured in real-world clinical settings. Such a rapid-learning health system, connected via electronic tools and infrastructure through which massive amounts of data can be aggregated and disseminated, can pave the way to a new generation of personalized medicine. It will then be possible to:

- ***Predict our individual susceptibility to disease****, based on genetic and other factors;*
- ***Provide more useful and person-specific tools for preventing disease****, based on that knowledge of individual susceptibility;*
- ***Detect the onset of disease at the earliest moments****, based on newly discovered chemical markers that arise from changes at the molecular level;*
- ***Preempt the progression of disease****, as a result of early detection; and*
- ***Target medicines and dosages more precisely and safely to each patient****,* on the basis of genetic and other personal factors in individual response to drugs.[1]

There are three requisite components of the rapid-learning health system that do not currently exist in the US biomedical enterprise: a mega-community in which all the various sectors of biomedicine can facilely collaborate; the electronic interoperability that enables a rapid flow of data among organizations and individuals; and the massive amounts of biological and clinical data that can be analyzed and evolved into knowledge to improve clinical decision-making and catalyze new discoveries.
At present, no systematic, national endeavor exists to connect all the requisite constituencies and capabilities together into a seamless, networked process to demonstrate the feasibility and value of this new model for health care.

The BIG Health Consortium™ was established in September 2008 to fulfill that need**.** The Consortium is designed to foster an integrated and interactive ecosystem (or "mega-community") of previously-unlinked sectors within life sciences and health care, who work collaboratively to implement a rapid-learning health system and thereby make personalized medicine a reality.

[1] "Personalized Health Care: Opportunities, Pathways, Resources", HHS, September 2007