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Title: *Big Data, Complexity, Wellness and Disease*

Abstract:
A systems approach to human health and the big data derived from genome and the longitudinal phenome of individuals leads to analyses are transforming our understanding of wellness and disease. We have employed genome and "deep phenotyping" to make billions of measurements on individual humans—assaying 100s of different biological networks--to generate 1000s of longitudinal data clouds that have given remarkable new insights into many aspects of human wellness and disease. Further, they lead us to a 21st century medicine that is predictive, preventive, personalize and participatory (P4) and that in turn leads one to the conclusion that healthcare has two major domains—wellness and disease. The objective of 21st century medicine will be to understand deeply and optimize wellness, to understand disease and its progressions and to identify and reverse the earliest transitions between the two—this will be the preventive medicine of the 21st century. These insights and others derived from longitudinal deep phenotyping of individuals have far-reaching implications for the practice of 21st century medicine, some of which will be discussed.