



# Michael Snyder

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Indiana Memorial Union, Oak Room

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## Using Big Data to Manage Health and Disease

**Abstract:** Presently, most research focuses on disease, with little attention paid to what keeps people healthy. We have been following a cohort of people using multiomics analyses and wearable devices in unprecedented detail to understand their personal baseline healthy states and analyze their transitions to disease and periods of metabolic perturbation. Our results demonstrate a global and system-wide level of biochemical and cellular changes occur during environment exposures and that the collection of different longitudinal data can be used to manage health.

**Biography:** Dr. Snyder received his Ph.D. training at the California Institute of Technology and carried out postdoctoral training at Stanford University. He is a leader in the field of functional genomics and proteomics, and one of the major participants of the ENCODE project.

His laboratory study was the first to perform a large-scale functional genomics project in any organism, and has developed many technologies in genomics and proteomics. These including the development of proteome chips, high resolution tiling arrays for the entire human genome, methods for global mapping of transcription factor binding sites (ChIP-chip now replaced by ChIP-seq), paired end sequencing for mapping of structural variation in eukaryotes, de novo genome sequencing of genomes using high throughput technologies and RNA-Seq. These technologies have been used for characterizing genomes, proteomes and regulatory networks.

Seminal findings from the Snyder laboratory include the discovery that much more of the human genome is transcribed and contains regulatory information than was previously appreciated, and a high diversity of transcription factor binding occurs both between and within species.

He has also combined different state-of-the-art "omics" technologies to perform the first longitudinal detailed integrative personal omics profile (iPOP) of person and used this to assess disease risk and monitor disease states for personalized medicine. He is a cofounder of several biotechnology companies, including Protometrix (now part of Life Tehcnologies), Affomix (now part of Illumina), Excelix, and Personalis, and he presently serves on the board of a number of companies. Dr Snyder is the author of the book: *Genomics and Personalized Medicine: What Everyone Needs to Know*

