

# Personal omics data informative for precision health and preventive care

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Multi-omics profiling, the measurement and analysis of a person's genome along with other biomolecular traits, is an important step toward personal health management that provides valuable, actionable information, according to findings presented at the American Society of Human Genetics 2017 Annual Meeting in Orlando, Fla.

"By measuring factors beyond the genome and including the environment over time, we can get a detailed portrait of a person's healthy state and understand what changes when he or she transitions to a disease state," said Michael P. Snyder, PhD, Chair of the Department of Genetics and Director of the Center for Genomics and Personalized Medicine at Stanford University, who led the research. "Taken together, these different types of data are valuable in managing one's health."

Dr. Snyder and colleagues at Stanford and The Jackson Laboratory focused their research on prediabetic individuals to study the potential for effective early intervention to prevent diabetes. Over four years, they sequenced the genomes of and collected longitudinal data on the RNA transcripts (transcriptomes), protein production (proteomes), metabolic products (metabolomes), and body microorganisms (microbiomes) of 98 participants with prediabetes, two with diabetes, and seven healthy controls. They also used wearable devices to track each participant's activity level and skin temperature.

"We found that this portrait really changes from person to person; we all have different molecular profiles," said Dr. Snyder. "If we are going to

move toward precision health and wellness, it's important to capture this profile at an individual level."

In addition to collecting multi-omic information on each participant, the researchers measured how these factors changed in response to two kinds of environmental stressors: weight gain induced by a month-long high caloric diet, and naturally occurring respiratory infections. They found that the multi-omic response to weight gain was different between the prediabetic and healthy groups. And within the prediabetic group, they found that insulin-sensitive people responded differently to dietary changes and illness than those who were insulin-resistant.

Future directions include continuing to track the current participants, as well as recruiting more participants to assemble a larger cohort. The researchers also hope to analyze the relative contributions of different lifestyle and environmental factors on participants' multi-omic profiles.

In the long term, Dr. Snyder said, "I want to change medicine. The way we manage health now is Byzantine - it's typically based on treating patients when they're sick. By collecting a wealth of information at the individual level about a person's healthy state, we can identify ways to keep him or her healthy and prevent disease."

**More information:** Snyder M et al. (2017 Oct 20). Abstract: Integrative personal omics profiling during periods of environmental stress. Presented at the American Society of Human Genetics 2017 Annual Meeting. Orlando, Florida. [ep70.eventpilotadmin.com/web/p...=ASHG17&id=170123003](http://ep70.eventpilotadmin.com/web/p...=ASHG17&id=170123003)

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