

NASA's twin study investigates metabolites

August 24 2017



NASA astronaut Scott Kelly enjoys his first drink from the ISSpresso machine on the International Space Station. Twins Study investigators saw metabolite levels increase when Scott went to space. Credit: NASA

You may think you're just an average Joe, but according to your metabolomics data your body is percolating some expressive information about your daily life.

"Metabolomics measures small molecules called metabolites that reflect the physiology of the body, and can reveal specific details about you. Researchers can see specific metabolites—such as caffeine—in your blood, and form hypotheses about your diet, lifestyle or environment," said Stanford University School of Medicine Postdoctoral Fellow Tejaswini Mishra, Ph.D. "For example, if we detected caffeine in your blood, it is likely that you had coffee before giving blood. With more data, we could also track your coffee-drinking habits, and perhaps even learn something about what type of coffee you drink! We might also see pesticides or derivatives of medications in the data, from which one could hypothesize whether a person gardens or farms, or lives in proximity to one, and which medications they might be on."

Mishra is integrating multi-omics data for NASA's Twins Study and comparing all the metabolites in retired twin astronauts Scott and Mark Kelly. She saw a number of Scott's metabolites increase in levels when he went to space and when he returned to Earth some of those stayed elevated. By integrating data from other Twins Study investigations, she hopes they can determine the cause of this elevation.

"It is incredible and powerful to have such rich data but it also is a little scary," Mishra said. "It really underscores the importance of securing your personal data, who you share it with, how you store it and protect it."

Twins Study researchers are investigating and securing an unprecedented amount of information. Most studies focus on two or three types of data but this is one of the few studies integrating many different types of data. By comparing identical genomes from twins, researchers can focus more attention to other specific molecular changes, such as metabolomics changes involving the end products of various biological pathways and processes. Mishra is helping to integrate data from metabolites, DNA, RNA, proteins, microbes, physiological and

neurobehavioral systems, as well as food and exercise logs, to help researchers create a timeline and identify patterns and correlations. Together, they hope to help identify health-associated molecular effects of spaceflight to protect astronauts on future missions.

More information: www.nasa.gov/twins-study/research

Provided by NASA

Citation: NASA's twin study investigates metabolites (2017, August 24) retrieved 18 April 2024 from <https://phys.org/news/2017-08-nasa-twin-metabolites.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.