

Researchers identify age-related differences in human blood metabolites

March 28 2016



Vegetables can be high in antioxidants, which are metabolites researchers find decrease in elderly adults. Credit: OIST

Metabolites—substances that are created during metabolism—can provide a wealth of information about individual health, disease, diet,

and life-style. Now, they can tell us even more. Okinawa Institute of Science and Technology Graduate University (OIST) researchers and collaborators at Kyoto University have recently discovered metabolites that are specifically related to aging and shed light on how the human body ages. The team, led by OIST's Professor Yanagida, published their results in *PNAS*.

In order to find and analyse the metabolites, the team obtained blood samples, including [red blood cells](#) (RBCs) from 30 healthy individuals: 15 young adults (29 ± 4 yr) and 15 [older adults](#) (81 ± 7 yr). Previously, RBCs have been overlooked in research, but as RBCs make up approximately half of blood volume, the researchers believed it was worth exploration.

Then, they used Liquid Chromatography-Mass Spectrometry (LC-MS), a technique that separates liquids and detects substances, to identify the metabolites within the blood. From there, they could calculate the coefficients of variation, or the standard deviation of metabolite abundance divided by the average, to identify which compounds had increased or decreased in the older adults.

"We found 14 age-related compounds," Yanagida said. "Of these 14 compounds, half of the them had decreased in [elderly people](#). The decrease was found in antioxidants and in compounds related to muscle strength. Therefore, elderly people had less antioxidants and less muscle strength."

The other half of the compounds that had increased were metabolites related to declining kidney and liver function.

"This makes sense," Yanagida said. "Common sense tells you that as we get older we lose abilities like muscle strength and kidney function, but no one has ever scientifically proved that this is the case before."In

addition, some of the age-related metabolites that are found on the same metabolic pathways have connected changes, which suggests that age affects them simultaneously.

"Functionally related [compounds](#) show the same tendencies to increase or decrease with age, or in other words, they show similar correlations," Yanagida said.

Now that these age-related metabolites have been identified, the decline in antioxidants and [muscle strength](#) suggest that it is important for individuals to consume foods high in antioxidants and to continue exercising, especially after the age of 65. This could help increase the levels of the related [metabolites](#) in the body and improve body conditions. While many unknown components to living a long and healthy life remain, the research team will continue to uncover as much information about healthful aging.

"Longevity is a great mystery for us," Yanagida said. "We want to find how elderly people can live a happy final stage of life. This is the way we can contribute to human health."

More information: Individual variability in human blood metabolites identifies age-related differences, *PNAS*, www.pnas.org/cgi/doi/10.1073/pnas.1603023113

Provided by Okinawa Institute of Science and Technology

Citation: Researchers identify age-related differences in human blood metabolites (2016, March 28) retrieved 29 June 2024 from <https://medicalxpress.com/news/2016-03-age-related-differences-human-blood-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.