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Plasma metabolic profiles are associated with habitual dietary patterns

Dietary factors play important roles in human metabolism and influence the status of health. So far, few human studies have been focused on how diet affects the plasma metabolome. In this study, we investigated the differences in plasma metabolic profiles between habitual high meat and seafood (HMS) eaters and low meat and seafood (LMS) eaters using mass spectrometry-based metabolomics methods, aimed to reveal the link between plasma metabolic profiles and habitual dietary intake. Plasma metabolites were profiled and compared between 83 HMS eaters and 82 LMS eaters from a healthy cohort in Singapore. A total of 49 differential metabolites were found between the two dietary groups. The difference was mainly reflected by higher concentrations of arachidonic acid (AA), eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and AA/EPA/DHA-content phospholipids in HMS eaters than in LMS eaters, although there were also differences in levels of other metabolites, such as D-glucose, glycine, and urea. We observed strong correlations across a wide range of plasma metabolites and food variables. The strongest association was found for DHA levels with fish consumption ($r=0.535$). Our study demonstrates that mass spectrometry-based metabolomics is a valid technique to dietary pattern analysis, and the findings illustrate that plasma metabolic profiles were associated with habitual diets.

Biography

Choon Nam Ong is the Director for the NUS Environmental Research Institute (NERI) and a Professor at the Saw Swee Hock School of Public Health, National University of Singapore. His main research interest is Environmental Health Sciences and his research group currently focuses on the use of metabolomics as a technology platform for biomedical and environmental research. He has published more than 300 papers in international peer-reviewed journals, with an h-index of 75 and over 17,000 citations.

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