

## **“AminoIndex technology” : A plasma free amino acid (PFAA) profiles-based screening indices for various cancers**

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As a target of “focused metabolomics”, amino acids are most suitable compounds because they have uniform physicality and play as hub-compounds of metabolic network. Especially, plasma free amino acids (PFAAs) would reflect the metabolic status of whole body because they link all organ systems and would be measured with ease. And it is also known PFAA profiles are altered by specific diseases including liver failure, diabetes, and cancer. Therefore, multivariate functions generated from PFAA profiles are potential monitoring indices of various diseases such as Fischer’s ratio, an established biomarker for hepatic cirrhosis.

In this study, we investigated the possibility of PFAA profiles derived multivariate functions as novel markers for early detection of various cancers. We collected plasma samples from venous blood of cancer patients with various types of cancer and healthy controls, and PFAA profiles were measured using LC-MS after derivatization.

Interestingly, significant alterations of PFAA profiles were observed in cancer patients. Then multivariate discriminating classifiers using PFAA profiles as explanatory variables were constructed for discriminating each cancer patients. These classifiers clearly discriminated cancer patients with each type from healthy controls, regardless of cancer stage.

These findings suggest that PFAA profiling has great potential for improving early detection of cancers. Furthermore, our result suggests that PFAA profiling can be utilized to determine various conditions of health from only single blood sample, imposing lower physical burden on subjects.

### **Biography**

Akira Imaizumi joined Ajinomoto Company in 1993 after graduating University of Tokyo. He has obtained his Ph.D in 2006 from University of Tokyo in microbiology. From 2006, he has been the senior scientist of Institute of Innovation, Ajinomoto, CO., Inc., a premier food, chemicals including amino acid manufacturing company. Now his specialties are biostatistics and metabolomics of human diseases.