

Potential stress biomarker for the evaluation of depressive state

Norio Ohashi

*Global COE Program, Department of Food and Nutritional Sciences,
Graduate School of Nutritional and Environmental Sciences, University of Shizuoka*

Previously, we studied on the identification of biomarker candidates for “stress-induced gastric ulcer” as a model of stress-related diseases. We analyzed the serum proteins before and after stress treatments in rats by proteomic approaches. Proteins from each serum were fluorescence-prelabeled and applied to two-dimensional difference image gel electrophoresis, and the protein spot volumes obtained were statistically analyzed by Decyder software program. Of over 2,000 protein spots detected, approximately 100 spots were 1.5-fold changed or more before and after stress treatment in a rat with stress-induced gastric ulcer. We successfully identified several protein species of these stress marker candidates by MALDI-TOF/TOF-MS. Furthermore, to evaluate the usefulness of these markers for the detection of other stresses, the hard running test in mans was conducted. The bloods from three persons were taken before and after the hard running and the biomarker candidates in sera were analyzed by ELISA. The results showed that some candidates were quantitatively changed up or down in the sera by the running stress. Additionally, we examined whether these biomarkers can evaluate the depressive state. The bloods from 94 hard workers of nurses in hospitals were collected. The depressive state was examined by Center for Epidemiologic Studies Depression Scale (CES-D), and 94 nurses were divided into three groups (high, middle, and low depressive states) by CES-D. By ELISA, we found that creatine kinase muscle type (CK-MM) in our biomarker candidates was significantly decreased in the group of the nurses with high depressive state. The finding suggests that CK-MM may be useful as a biomarker for the evaluation of depressive state.

(Research collaborators: Ayako KATO^{1, 2}, Tsutomu NAKAYAMA¹, Masanobu AKIMOTO², Hiroyuki SAKAKIBARA¹, Kayoko SHIMOI¹, Hirohito TSUBOI³; *Graduate School of Nutritional and Environmental Sciences, University of Shizuoka*¹, *Prima Meat Packers, Ltd.*², and *Fujita Health University*³)