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Neuropsychological toxicity in stress predicted through a primate model of dietary therapy with novel multimodal sensing systems and algorisms

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Abstract

Mental problems caused by various kinds of stress induce neurotoxic damage through biological mechanisms like oxidation or metabolic unbalancing. We evaluated the dietary supplementation of antioxidant and nutrition, ubiquinol with milk in normal isolated adult common marmoset (*Callithrix jacchus*) as a preliminary preclinical study. The primates were fed with milk with or without ubiquinol every day for three months and after a two-month-interval, the treatment conditions were alternated. Psycho-physiological state was evaluated by video-recording of social behavior, body temperature detection by a simple IR thermal camera and a blood glucose chip-sensor. Furthermore, social behavior data were information-processed by technology to integrate multiple factors, 'Behavior output analysis for quantification of emotional state translation' abbreviated as BOUQUET, which visualized a statistical partial space where the status of high ubiquinol and low ubiquinone in plasma strongly correlated with high frequency of social approaching behavior and lower body temperatures in a social meeting context. This analysis also suggested that high frequency of face direction to a peer correlated with the high ubiquinol-low ubiquinone and high variation of body temperature. Blood glucose seemed weakly relevant to alert behavior in this multiple correlation. These results imply that unbiquinol supplementation promotes social motivation. Finally, the result that the BOUQUET and the sensor systems revealed the implicit psycho-physiological information suggests its applicability in various toxico-psycho-pathological studies as quantitative manner.

We would like to introduce our recent human application studies to develop 'Smart-Network Systems for Healthy Life'.

Biography

Mamiko Koshiba previously worked as a chief of microsurgery optic systems design-engineer of Mitaka Kohki and has completed her PhD in 2005 from Tokyo University of Agriculture and Technology (TUAT), and postdoctoral studies at National Center of Neurology and Psychiatry. She was the Guest Associate Professor of TUAT in 2011-2012 and is the Guest Associate Professor of Saitama Medical University.