

10<sup>th</sup> World Congress on

# NUTRITION & FOOD SCIENCES

May 29-31, 2017 Osaka, Japan

## Prevention of age-related cognitive dysfunction: Mechanism of action of green tea catechins on mouse brain

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The consumption of green tea catechins (GTCs) suppresses age-related cognitive dysfunction in mice. GTCs are composed of several catechins, of which epigallocatechin gallate (EGCG) is the most abundant, followed by epigallocatechin (EGC). Orally ingested EGCG is hydrolyzed by intestinal biota to EGC and gallic acid (GA). To understand the mechanism of action of GTCs on the brain, their permeability of the blood brain barrier (BBB) as well as their effects on cognitive function in mice and on nerve cell proliferation *in vitro* were examined. The *in vitro* BBB permeability (% in 30 min) of EGCG, EGC and GA was 2.8±0.1, 3.4±0.3 and 6.5±0.6, respectively. The permeability of EGCG into the BBB indicates that EGCG reached the brain parenchyma even at a very low concentration. The learning ability of SAMP10 mice (a mouse model of brain senescence) that ingested EGCG (20 mg/kg) was significantly higher than of mice that ingested EGC or GA. However, combined ingestion of EGC and GA showed a significant improvement comparable to EGCG. SH-SY5Y cell growth was significantly enhanced by 0.05 µM EGCG, but this effect was reduced at higher concentrations. Co-administration of EGC and GA increased neurite length more than EGC or GA alone. These results suggested that cognitive dysfunction in mice is suppressed after ingesting GTCs, when a low concentration of EGCG is incorporated into the brain parenchyma via the BBB. Furthermore, the additive effect of EGC and GA suggests that EGCG sustains a preventive effect after the hydrolysis to EGC and GA.

### Biography

Monira Pervin has completed her PhD studies in Nutritional Biochemistry from Graduate School of Nutritional and Environmental Sciences, Department of Food and Nutritional Sciences, University of Shizuoka, Japan with thesis entitled: "Studies on biological effects of plant lectins on animal cells and tissues". At present, she is working as Post-doctoral Research Assistant in Tea Science Center, Graduate School of Integrated Pharmaceutical and Nutritional Sciences, University of Shizuoka, Japan on prevention of brain aging by green tea catechin using human neuroblastoma SH-SY5Y cells and mouse brain tissues. Her work has been reported in 15 published papers in peer-reviewed journals.

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