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Poster Sessions

Investigation of membrane proteins interacting with food-derived antioxidant ergothioneine based on hippocampal proteomics analysis

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Hydrophilic antioxidant ergothioneine (ERGO) is not synthesized in mammals, but ingested from daily life in humans. Oral administration of ERGO exhibits several beneficial effects in the brain in experimental animals. ERGO promotes neuronal differentiation of neural progenitor cells in primary culture, and involvement of the activation of mTOR pathway has been proposed (Cell Signal 53, 269, 2018), although its directly interacting proteins have not yet been clarified. The aim of the present study is to perform comprehensive study to clarify the pathways involved in the pharmacological activity of ERGO. After repeated oral dose of ERGO or vehicle alone in normal mice, hippocampal dentate which is important in neurogenesis was isolated, and membrane proteome analysis using LC-MS/MS was conducted. Accordingly, 3,337 proteins were identified, and we found change in expression of proteins associated with mitochondria and synapse formation. Mouse neural stem cells were primarily cultured for 6 days, followed by incubation with ERGO. Gene product of neuronal marker b-III tubulin was increased by ERGO, confirming neuronal differentiation. Effect of ERGO on mitochondrial proteins is now under investigation.