World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:8, No:12, 2014

Expression of ULK-1 mRNA in Human Peripheral Blood Mononuclear Cells from Patients with Alzheimer's Disease

Authors : Ali Bayram, Remzi Yiğiter

Abstract : Objective: Alzheimer's disease (AD), the most common cause of dementia, is a progressive neurodegenerative disease. At present, diagnosis of AD is rather late in the disease. Therefore, we attempted to find peripheral biomarkers for the early diagnosis of AD. Herein, we conducted a study to investigate the unc-51 like autophagy activating kinase-1 (ULK1) mRNA expression levels in human peripheral blood mononuclear cells from patients with Alzheimer's disease. Method: To determine whether ULK1 gene expression are altered in AD patients, we measured their gene expression in human peripheral blood cell in 50 patients with AD and 50 age and gender matched healthy controls by quantitative real-time PCR technique. Results: We found that both ULK1 gene expression in peripheral blood cell were significantly decreased in patients with AD as compared with controls ($p < 0.05$). Lower levels of ULK1 gene expression were significantly associated with the increased risk for AD. Conclusions: Serine/threonine-protein kinase involved in autophagy in response to starvation. Acts upstream of phosphatidylinositol 3-kinase PIK3C3 to regulate the formation of autophagophores, the precursors of autophagosomes. Part of regulatory feedback loops in autophagy: acts both as a downstream effector and negative regulator of mammalian target of rapamycin complex 1 (mTORC1) via interaction with RPTOR. Activated via phosphorylation by AMPK and also acts as a regulator of AMPK by mediating phosphorylation of AMPK subunits PRKAA1, PRKAB2, and PRKAG1, leading to negatively regulate AMPK activity. May phosphorylate ATG13/KIAA0652 and RPTOR; however such data need additional evidences. Plays a role early in neuronal differentiation and is required for granule cell axon formation. Alzheimer is the most common neurodegenerative disease. Our results provide useful information that the ULK1 gene expression is decreased in the neurodegeneration and AD patients with, indicating their possible systemic involvement in AD.

Keywords : Alzheimer’s sisease, ULK1, mRNA expression, RT-PCR
Conference Title : ICHG 2014 : International Conference on Human Genetics
Conference Location : Bangkok, Thailand
Conference Dates : December 18-19, 2014