

Abstract

One of the pathologies associated with Alzheimer's disease (AD) is increased activity of CDK5 kinase and downregulation of isomerase Pin1. Other observed pathology is aggregation of phosphorylated protein CRMP2 (Collapsin response mediator protein 2) in insoluble neurofibrillary tangles. One of the risk factors of AD is traumatic brain injury, which leads to increased accumulation of insoluble proteins.

In this work is characterized the effect of high CDK5 kinase activity and low Pin1 level (similar as found in Alzheimer's disease) on formation and spread of hyperphosphorylated CRMP2 aggregates *in vivo* in models of mild repetitive traumatic brain injury. Western blot and immunostaining was used for characterization of specific accumulation of insoluble CRMP2A in brain and his phosphorylation and also for phosphorylation of C-terminal of CRMP2.

The results suggest that increased phosphorylation, conformational stress, and TBI leads to an increase of insoluble phosphorylated CRMP2A in brain, which can lead to pathology of AD, due to accumulation of insoluble aggregates. However, the additivity of these processes has not been confirmed.