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Electrophoretic analysis of amyloid precursor protein oligomers separated from mouse brain cortex

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Background: Amyloid precursor protein (APP) is a membrane protein highly expressed in the brain, involved in the pathogeny of Alzheimer's disease. Recently, protein dimers were reported to occur in vitro, with impact on pathologic metabolization and senile plaque formation.

Aim: Our study investigated whether the expression of APP is dependent on a membrane scaffolding protein–caveolin and if in native state, APP can be found in dimeric or oligomeric complexes.

Materials & Methods: Brain cortex was pre-levated from 7-9 month old normal and caveolin knockout mice and investigated for amyloid precursor protein by reducing and non-reducing electrophoresis, followed by western blotting. Membranes were next separated by ultracentrifugation and investigated for APP containing macromolecular complexes by non-denaturating, blue native electrophoresis.

Results: APP expression was modified by the absence of caveolin, depending on the brain region. Electrophoretic separation of macromolecular complexes from mouse brain cortex was dependent on the extraction buffer and type of gel. No dimeric or low-rank oligomers were highlighted with the selected protocols.

Conclusion: APP dimers were not present in the investigated brain regions even under mild protein extraction conditions. We propose that dimerization is either an in vitro occurrence, or is masked by association with another membrane protein in macromolecular complexes.

Biography

Ana Maria Enciu is an Assistant Professor in Cell Biology at Carol Davila University of Medicine and Research Assistant at Victor Babes Institute of Pathology. She has completed her PhD in Neurosciences with a study on blood-brain barrier tight junction proteins. She continued with a Post-doctoral Training in Neuro-Oncology. She has published more than 20 papers and has been serving as an Editorial Board Member for Austin Alzheimer's and Parkinson's Disease journal since 2014.

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