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Hippocampal neural proteins interaction of Alzheimer's peptide: 14-3-3 zeta as potential therapeutic biomarker

Pratibha Sharma and **A Srinivasan**
All India Institute of Medical Sciences, India

Introduction: Alzheimer's disease (AD) is the most common form of dementia. Amyloid beta(1-42) is prone to aggregate and found in plaque interacting with various proteins. Low molecular weight oligomeric form of amyloid beta is found as most toxic and responsible for disease process. Hippocampus is the primary region of the brain affected by AD. In this study, interaction profiles of oligomer and monomer form of amyloid-beta binding hippocampal neuron intracellular and cytosolic proteins were obtained.

Methods: Amyloid beta(1-42) peptide- monomer and oligomer forms separated using gel-filtration chromatography. These were allowed to pull-down separately with hippocampal tissue neuron plasma membrane and cytosolic proteins using affinity chromatography in proteins native form. Interacting proteins were digested in-solution by trypsin and identified using mass spectrometry ESI-Triple-TOF5600, searched Uniprot database using software Protein pilot 4.2. Gene ontology and pathway analysis software Cytoscape was used for classification and interactions of proteins with respect to AD and apoptosis pathways.

Result: Proteins found unique binding amyloid beta peptide monomer are synuclein-beta, SNAP25, lipophilin, EAAT-2 and SRPRB. Proteins found unique binding amyloid beta peptide oligomer are tubulin-beta, Tau(MAPT), 14-3-3 and phospholipase A2.

Conclusion: Oligomer binding proteins may help in understanding the disease toxicity mechanism. Whereas, 14-3-3 protein could be possible novel therapeutic target for diagnosis, treatment and in understanding progression of AD.

Biography

Pratibha Sharma is a PhD student at All India Institute of Medical Sciences, India.

pratibha.aiims@gmail.com

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