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Plant extracts as metal chelators for treatment of Alzheimer's disease

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Lots of pathological factors including Amyloid β (Aβ) aggregation contribute to the progression of Alzheimer's disease (AD). Thereby, multi-functional agents are being favored in treatment of AD in recent years. Formations of Aβ plaques are triggered mainly by divalent metals found in brain via two mechanisms. First mechanism results from lipid permeability of the metal ligand which leads to increased intracellular Cu+2 levels. The Cu+2 induces activation of Src kinase (p-src) and inhibition of protein tyrosine phosphatases (PTP) leading to phosphorylation of EGFR. Cu may also induce release of cognate EGFR ligands such as EGF or HB-EGF. Activation of EGFR induces up-regulation of ERK activity (p-ERK) and through a synergistic effect with PI3K-JNK pathway, increases metalloprotease expression; this results in increased cleavage of the Aβ peptide. Second mechanism is the interaction between two charged metal ions and Aβ, which consists of 42 amino acids wrapped around them leading to aggregation. The use of metal chelators is required for both mechanisms. All metal chelators that are currently used have neurotoxic effects. Therefore, 25 different plant extracts which has lower toxicity possibility were investigated for Fe+2, Cu+2 and Zn+2 chelating capacity. During this process, incorrect results were obtained due to the green color of the extract. To overcome this, new methods for Zn+2 and Cu+2 binding capacity is proposed based on the shift in the UV spectrum of murexide. Results of our studies suggested that *Hypericum capitatum*, Melissa *officinalis, Pulicaria dysenterica, Rosmarinus officinalis* have the highest metal binding activities.

Biography

Fatma Kazdal is a Master's student in Biotechnology Program at Institute of Health Sciences, Bezmialem Vakif University, Turkey.

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