1106-Q1-2505 **Shantia Yarahmadian*** (syarahmadian@math.msstate.edu), **Hadi Khani** and **Eda Asili**. *A Mathematical Model for Alzheimer Disease and it's Treatment Based on the Metal Ions Hypothesis.*

The aggregation of amyloid-beta by self-assembly into oligomers is a central event in Alzheimer's disease. In this work, we propose a mathematical model as a set of coupled kinetic equations that governs the self-assembly of amyloid-beta filaments in the presence of transition-metal ions. Metal ions have been hypothesized as an important factor in the pathogenesis of AD. There is a considerable literature supporting the impact of metal ions such as copper (Cu), zinc (Zn) and iron (Fe) in many critical aspects of AD and other neurodegenerative diseases. Our study includes Cu and Zn as main transition-metal ions, where their coordination to A-beta regulates the aggregation process in vivo. Metal ions mostly affect the nucleation phase and change both the structure and the charge of A-beta. Our model describes the general features of the kinetics of fragmenting filamentous structures. (Received September 16, 2014)