NANO-INTERVENTIONS FOR ALZHEIMER’S DISEASE

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Objectives: Dementia of Alzheimer’s type (AD) affects memory, thinking and behavior. Scientists believe that changes in the brain may begin 10-20 years before symptoms appear and AD is diagnosed. The need to diagnose and treat the devastating disease at an early stage is critical to manage and treat AD. Unfortunately, the lack of validated biomarkers limits the possibility of the earlier stages of Alzheimer’s disease. The advance of nanotechnology could offer huge opportunities in early-stage diagnosis and well-treatment of AD.

Methods: This presentation discusses the challenges of current treatment and diagnosis of AD and the development on biocompatible nanoparticles, and provide the rational and potentials of using nanoparticles for both drug carrier and imaging contrast agent for diagnosis and treatment of AD.

Results: Biocompatible nanoparticles with diameter in the range of 1-100 nm could be used as targetes delivery system for drugs (e.g. Rivastigmine) to overcome the blood-brain barrier (BBB), and to minimize the side effects caused by over-dosage. In addition, biocompatible nanomaterials with enhanced optical and magnetic properties, may allow them being excellent alternative contrast agents for early-stage diagnosis.

Conclusion: With more studies on using nanomaterials and nanotechnology in complex biochemical environment of the central nervous system, it is most likely that nanomaterials and nanotechnology can be give significant impact on the early-stage diagnosis and treatment of AD. According to personal experiences, the author’s of this presentation discuss the application of new class of nanoparticles to the treatment and diagnosis of Alzheimer’s disease.