

Nanotechnology-based drug delivery systems for Alzheimer's disease management: Technical, industrial, and clinical challenges

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Abstract:

Alzheimer's disease (AD) is a neurodegenerative disease with high prevalence in the rapidly growing elderly population in the developing world. The currently FDA approved drugs for the management of symptomatology of AD are marketed mainly as conventional oral medications. Due to their gastrointestinal side effects and lack of brain targeting, these drugs and dosage regimens hinder patient compliance and lead to treatment discontinuation. Nanotechnology-based drug delivery systems (NTDDS) administered by different routes can be considered as promising tools to improve patient compliance and achieve better therapeutic outcomes. Despite extensive research, literature screening revealed that clinical activities involving NTDDS application in research for AD are lagging compared to NTDDS for other diseases such as cancers. The industrial perspectives, processability, and cost/benefit ratio of using NTDDS for AD treatment are usually overlooked. Moreover, active and passive immunization against AD are by far the mostly studied alternative AD therapies because conventional oral drug therapy is not yielding satisfactorily results. NTDDS of approved drugs appear promising to transform this research from 'paper to clinic' and raise hope for AD sufferers and their caretakers. This review summarizes the recent studies conducted on NTDDS for AD treatment, with a primary focus on the industrial perspectives and processability. Additionally, it highlights the ongoing clinical trials for AD management. © 2016 Elsevier B.V.

Reference:

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