

5<sup>th</sup> Global Summit on **BRAIN DISORDERS AND THERAPEUTICS**

August 05-06, 2024 | Paris, France

**Advances in alzheimer's disease treatment and innovations in targeted medications****Zhihua Luo**

Chonggang General Hospital, China

**Objective:** Alzheimer's disease (AD), a progressive neurodegenerative disease characterized by memory loss and cognitive impairment, is the most prevalent form of dementia, posing a severe threat to global public health. This review aims to explore the latest advancements in AD treatment, particularly the innovations in targeted therapeutics against Tau protein aggregation.

**Methods and Materials:** By analyzing cutting-edge scientific literature, we focused on novel therapeutic approaches for AD, specifically targeting Tau protein. Tau protein plays a pivotal role in the pathogenesis of AD, and its abnormal aggregation is closely related to the progression of the disease. Various biochemical methodologies, such as Thioflavin-T fluorescence assay, Circular Dichroism (CD) spectroscopy, Transmission Electron Microscopy (TEM), and Quartz Crystal Microbalance with Dissipation monitoring (QCM-D), were employed to assess the inhibitory effects of different compounds on Tau protein aggregation.

**Results:** Study on Tau Protein Inhibitors: Experiments revealed that at the same equivalent TLK concentration, the TLK peptide only induced a 19% decrease in fluorescence intensity, indicating a relatively low inhibitory efficiency. The inhibitory effect of NanoTLK significantly enhanced with the increase of peptide ratios. Interaction of NanoTLK with Tau Protein: QCM-D measurements showed that NanoTLK triggered a significant resonance frequency attenuation ( $\Delta F$ ) with toxic Tau aggregates, indicating a strong affinity of NanoTLK for Tau aggregates. Effect of NanoTLK on Cell Viability: Studies demonstrated negligible cytotoxicity for TLK PM and NanoTLK at varying concentrations from 10 $\mu$ M to 80 $\mu$ M, indicating good biocompatibility. Neuroprotective Effect of NanoTLK: Experimental results indicated that NanoTLK restored cell survival reduced by Tau aggregates to 90% at most in a concentration-dependent manner. NanoTLK Facilitates Tau Aggregate Degradation: Studies showed that NanoTLK-Tau complexes were more susceptible to protease K degradation compared to mature Tau aggregates.

**Conclusion:** Current AD treatments primarily focus on symptom alleviation, lacking effective methods to slow down or halt disease progression. However, targeted therapeutic strategies against Tau protein aggregation demonstrate significant potential. NanoTLK, as a novel Tau-targeted nanoinhibitor, effectively inhibits Tau protein aggregation and significantly enhances the degradation of Tau aggregates, reducing Tau-induced cytotoxicity. This Tau-targeting strategy offers a new direction for AD treatment, potentially opening a new chapter in the development of more effective AD medications. With ongoing research and clinical trials, there is hope for more effective AD treatment methods in the near future.

**Biography**

Zhihua Luo is a prominent medical professional at Chonggang General Hospital in China. Renowned for their dedication and expertise, Luo has significantly contributed to advancing healthcare practices within the hospital. Their leadership and innovative approach have played a crucial role in enhancing patient care and medical research at Chonggang General Hospital. Luo's commitment to medical excellence continues to inspire colleagues and benefit the broader healthcare community in China.