
Departmental Seminar

Seminar Title	: MULTIFACETED INTERACTING INTERFACE HOSTED BY CORONA OF BIOLOGICALLY SYNTHESIZED NANOPARTICLE TRAPS MONOMERIC α -SYNUCLEIN AGAINST THE AMYLOID FIBRILLATION
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Venue	: LS Seminar Hall
Date and Time	: 16 Dec 2024 (15:30)
Abstract	<p>: Introduction: Parkinson's disease (PD) is a multifaceted progressive neurodegenerative disorder, often characterized by the loss of dopaminergic neurons and the abnormal accumulation of amyloid plaques with alpha-synuclein (αS) as major constituents. αS is an intrinsically disordered protein of 140 amino acids with the potential to form several cytotoxic fibrillation intermediates. Small molecules (especially phytochemicals) with anti-amyloidogenic potential have been reported to tackle PD onset and progression in vitro. Unfortunately, the poor blood-brain barrier (BBB) permeability and bioavailability of the molecule have been the major concern. Aim & Objective: The development of new therapeutics that sequester the αS monomers in their native state against the fibrillation pathway, besides the potentials of crossing blood-brain barrier and enhance the bioavailability, would be the plausible approach to delay or mitigate the onset of PD.</p> <p>Results: In this line, the anti-amyloidogenic propensity of bare and surface moderated ZnONPs against αS is explored, where the in silico and in vitro studies show that the moderated nanointerface potentially bind to αS monomers, and stabilize the protein in its native conformation onto the NP surface, and the complex altogether is called as flocs. Further, the GC-MS-based analysis of the nano corona indicated the presence of phytochemicals, like Tofisopam, Flavokawain B, which rationalized the better anti-amyloidogenic property of the biosynthesized nanoparticle compared to bare or tyrosine functionalized nanoparticle. Conclusion: The study exemplifies the use of biologically synthesized ZnONP to improve the poor BBB-permeability and bioavailability of several phytochemicals and their use as therapeutic agents to reduce the aggregation of αS and mitigate the occurrence of Parkinson's disease.</p>