EuroSciCon

8th Edition of International Conference on

Chemistry Education and Research

August 27-28, 2018
Zurich, Switzerland

Mahesh Narayan, J Org Inorg Chem 2018, Volume 4
DOI: 10.21767/2472-1123-C5-013

Aβ, A RISK FACTOR FOR PARKINSON'S PATHOGENESIS: MECHANISMS AND PREVENTION

Mahesh Narayan

The University of Texas at El Paso, USA

Amyloid beta (Aβ) aggregation is generally associated with Alzheimer's onset. We have demonstrated that incubation of dopaminergic SH-SY5Y cells with an Aβ peptide fragment (an 11-mer composed of residues 25–35; Aβ (25–35)) results in elevated intracellular nitrosative stress and induces chemical mutation of protein disulfide isomerase (PDI), an endoplasmic reticulum-resident oxidoreductase chaperone. Furthermore, Aβ (25–35) provokes aggregation of both the minor and major biomarkers of Parkinson's disease, namely, synphilin-1 and α-synuclein, respectively. Importantly, fluorescence studies demonstrate that Aβ (25–35) triggers colocalization of these Parkinsonian biomarkers to form Lewy-body-like aggregates, a key and irreversible milestone in the neurometabolic cascade leading to Parkinson's disease. In addition, fluorescence assays also reveal direct, aggregation-seeding interactions between Aβ (25–35), PDI and α-synuclein, suggesting neuronal pathogenesis occurs via prion-type cross-transfectivity. These data indicate that the introduction of an Alzheimer's-associated biomarker in dopaminergic cells is proliferative, with the percolative effect exercised via dual, independent, Parkinson-pathogenic pathways, one stress-derived and the other prion-like. The results define a novel molecular roadmap for Parkinsonian transfectivity via an Alzheimeric burden and reveal the involvement of PDI in amyloid beta induced Parkinson's. We have also explored the ability of phytochemicals to intercept Aβ-driven Parkinson's pathogenesis via multiple mechanisms. Results from these studies will be discussed.

Biography

Mahesh Narayan has completed his PhD in Biophysics at The Ohio State University and pursued Postdoctoral studies at Cornell University. Currently, he is a Professor of Chemistry at The UTEP and serves on the Editorial Board of *PLOS One* and *Cell Biochemistry and Biophysics*. He has published extensively in the areas of protein folding, Parkinson's disease and pedagogical inroads in chemistry.

mnarayan@utep.edu