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Natural plant products based therapeutics: a search for new generation of combination therapy and phytopharmaceuticals for Parkinson's disease

Sinjan Choudhary

University of Mumbai, India

α -Synuclein (α -Syn) is an intrinsically disordered protein expressed ubiquitously in various parts of nervous system and is involved in many biological processes like release of neurotransmitter and vesicular trafficking. But this protein is highly prone to aggregation even under physiological condition and leads to various neurodegenerative diseases like Parkinson's disease (PD). Most of the conventional drugs for the treatment of PD are synthetic in nature and are not fully efficient in preventing the progress or curing the disease. In addition, they are also coupled with several adverse side-effects. Plant based natural products are rich source of active components having diverse bioactivity. Natural products are expected to have high efficiency as well as less side effects and henceforth may offer alternative therapy for PD. Though their herbal preparations have long been used in the treatment of variety of diseases such as cancer, cardiovascular disorders, ophthalmic problems, liver dysfunction and many others, their potential against protein fibrillation is mostly unexplored. Many plant products such as safranal, algal sulfated polysaccharides, plant metabolite like butein, diadzein, fisetin and scopoletin have been found effective against α -Syn fibrillation. Some of these molecules like diadzein and scopoletin are capable of crossing BBB and therefore can be considered as effective lead candidates for the development of drug molecules against PD. A comprehensive exploration of the effects of such plant derived bioactive compounds on α -Syn fibrillation will help in designing the appropriate interventions and also in development of new generation of phytopharmaceuticals, which can be used alone or in combination with other drugs aimed for Parkinson's disease.

Biography

Sinjan Choudhary is currently working as Assistant Professor in the Department of Chemistry, UM-DAE Centre for Excellence in Basic Sciences, Mumbai. She obtained her M.Sc. in Biotechnology (2008) from Jawaharlal Nehru University, New Delhi and a Ph.D. in Biophysical Chemistry (2012) from Indian Institute of Technology Bombay, Mumbai. He has performed fundamental work in Biophysical characterization of protein-solvent and drug-protein interactions and protein folding intermediates using combination of spectroscopy and calorimetry during her Ph.D. Subsequently, she joined UM-DAE Centre for Excellence in Basic Sciences, Mumbai for her postdoctoral studies (2013-2015). As a postdoctoral fellow she was involved in structural characterization of ribosomal proteins from different parasites using different biophysical techniques. She started independent research work on 'Inhibition of protein fibrillation related diseases small molecules' which was supported by DST-SERB Early Career Research Award. Her research work has been published in various reputed international journals. She has also been inducted as Editorial Board Member of Journal of Chemical Thermodynamics and Guest Editor of International Journal of Food Science and Technology titled "Functional foods and bioactive compounds in the management of neurodegenerative diseases". She is recipient of various awards such as "Professor Shantilal Oswal Young Scientist Award" and "Giauque Memorial Award" in recognition of the research work. She has also recently initiated research on prevention of Malaria with the support of DST-SERB Core Research Grant. Dr. Choudhary's current research group is involved in small molecules and plant products based therapeutics for neurodegenerative and infectious diseases. She has published around 40 research publications in various reputed scientific journals.

sinjan.choudhary@cbs.ac.in