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Development of diagnostic and prognostic biomarkers and understanding the signaling using protein interaction network in neurodegenerative diseases

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Neurodegenerative Diseases (NDs) involve sequentially interacting pathological cascades, including the interaction of amyloid-beta aggregation with plaque deposition, Lewy bodies formation, initiation of seizures, tremor and hyper-phosphorylation of tau protein with formation of tangles. Together with associated processes, such as inflammation and oxidative stress, these pathological cascades contribute to loss of synaptic integrity and progressive neurodegeneration. Today the focus is being placed on the discovery of oxidative stress biomarkers for the understanding of neurological disorders. Inadequacy in disease detection/treatment and the lack of diagnostic and prognostic tools have prompted investigators to turn to proteomics-based biomarker discovery. In the present study, we have developed animal models using zebrafish and Wistar rats for multiple NDs. The differential expression of proteins was analyzed in serum and brain tissue with the disease progression. The behavior studies and biochemical analysis confirmed the desired pathology in the animal model. The differentially expressing proteins were identified and subjected for further validation in humans for the prospective diagnostic/prognostic biomarkers. Further characterization of these proteins will likely shed more light on the mechanisms by which the changes or modification in these proteins and their interaction with the other protein in the pathway. The current study will also contribute to identify the new drug targets for subsequent therapeutic development and also the link between the different NDs. This link can also help in understanding the initiation of all neurological damage.

Speaker Biography

Deepshikha Pande Katare has the research and teaching experience of 21 years and she has been extensively working in the area of Pharmaceutical/Medical Biotechnology. She has Master degree in Genetics with Human Genetics specialization and PhD in Biotechnology. In the past she has worked at NIPER, Mohali, Chandigarh and Hamdard University, New Delhi for about 10 years. Currently she is working as Professor and Head Medical Biotechnology in Amity University. The research area is human health where she is working with collaborators both from India and Abroad as well as PhD scholars registered under her Supervision from multidiscipline specialization. She has undertaken various research projects and successfully guided PhD students in the area of Diagnostic prognostic biomarkers of HCC and Lung cancer and phytosomal formulations and characterization for epilepsy and Parkinson's disease. She has around 42 patents and more than 70 publications in the related area.

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