Exploring Parkinson’s Disease, from Physics to biology

The fundament of many neurodegenerative disorders is linked with the misfolding and aggregation of protein in brain cells. Parkinson’s disease (PD), occur in late mid-life, is the second most prevalent neurodegenerative disorder after Alzheimer’s disease. Gene mutations in the leucine-rich repeat kinase 2 (LRRK2) are the most common cause of autosomal dominant PD with pleomorphic pathology. Here, we generated a novel PD model Drosophila melanogaster by overexpressing hLRRK2 (R1441C) in dopaminergic neurons, which replicated the essential features of Human PD including age dependent dopaminergic degeneration. To understand the PD progression and the molecular machinery associated with hLRRK2 (R1441C) pathology, the expression of entire transgenic Drosophila head proteome and phosphoproteome were characterized at different disease stages by using mass spectrometry. As a first group in the scientific world, we discovered a dynamic and temporal proteomics and phosphoproteomics changes in human LRRK2 (R1441C) Drosophila melanogaster PD model and we are really optimistic that our PD profiling study would shed light on the fundamental etiology of PD.

Dr. Shariful Islam

Dr. Md. Shariful Islam is an assistant professor in the department of Mathematics and Physics, NSU. Dr. Islam did his PhD from Max Plank Institute for Lung and Heart, Bad Nauheim, Germany & Ludwig Maximilian University of Munich, Munich, Germany in 2015. In 2016, Dr. Islam joined in Moore’s laboratory, Van Andel Institute, Grand Rapids, Michigan as a post-doctoral fellow. In 2017, Dr. Islam was awarded American Parkinson’s Disease Association (APDA) post-doctoral fellowship to explore new insights into the pathophysiology, etiology and treatment of Parkinson’s disease. Dr. Islam is interested to understand the Parkinson’s Disease (PD) and its pathways of neurotoxicity by using Mass-spectrometry based proteomics. His long term goal is to establish a world-class Mass-spectrometry based proteomics lab in Bangladesh.