

Announcing the Final Examination of Faisal Abedin for the degree of Doctor of Philosophy in Physics

Date: June 30, 2021

Time: 10:30 a.m. (Eastern Time)

Zoom Link:

<https://ucf.zoom.us/j/95995624005?pwd=N1dJODZRd2dHcDREM3VESTJPFVZz09>

Meeting ID: 959 9562 4005

Passcode: 658961

Dissertation title: Biophysical Analysis of the Structure and Aggregation of Amyloid β Peptide.

Abstract:

Alzheimer's disease (AD) is the major cause of dementia and is characterized by neuronal death and brain atrophy. The amyloid β ($A\beta$) peptide is tightly associated with neuronal dysfunction during AD, but the molecular mechanism underlying the neurotoxic effect of $A\beta$ is poorly understood. Extracellular fibrillar deposits (plaques) of $A\beta$ were initially believed to be the cause of AD, but currently there is overwhelming evidence that the prefibrillar $A\beta$ oligomers are the major toxic entities. Structural characterization of $A\beta$ oligomers and fibrils is important for understanding the structural features determining the toxic potency of the peptide. This project has studied the aggregation and accompanying structural transitions of $A\beta$, a naturally occurring hypertoxic species, i.e. pyroglutamylated $A\beta$, and their combination, using biophysical approaches (circular dichroism, fluorescence, infrared spectroscopy). In addition, aggregation and structure of overlapping peptide fragments have been studied to identify the specific stretch of $A\beta$ that serves as seeding region initiating the aggregation and fibril formation by the full-length $A\beta$ peptide. These studies elucidate the structural features of $A\beta$ responsible for the peptide's neurotoxic action.

Outline of Studies:

Major: Physics

Educational Career:

M. S. University of Texas at El Paso, USA, 2016

B. S. University of Dhaka, Bangladesh, 2012

Committee in Charge:

Dr. Suren Tatulian (Chair)

Dr. Talat Rahman

Dr. Aniket Bhattacharya

Dr. Ellen Kang

Dr. Kenneth Teter (External Committee Member)

Approved for distribution by Dr. Suren Tatulian, Committee Chair, on June 21, 2021.

The public is welcome to attend remotely .