Amyloid Diseases: An Ion Mobility-Mass Spectrometry Approach to their Molecular Basis

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Amyloid diseases such as Alzheimer's Disease and Diabetes Type II are characterized by rapidly aggregating peptides/proteins that interfere with cellular function leading to disease and death. In recent years it has become apparent that the proximal causative agents of these diseases are the early oligomer states of the peptide/protein. These oligomer states are difficult to study using traditional spectroscopic techniques since they are in dynamic steady state and cannot be isolated. In recent years we have applied ion mobility based mass spectrometry to a number of these aggregating systems. We have been able to determine both oligomer distributions and the structures of the oligomers using molecular modeling coupled to experiment. In this talk I will summarize the current state of affairs of our work on the Abeta peptide responsible for Ålzheimer's disease and the IAPP peptide responsible for Diabetes Type II.