

## W0189

**Supramolecular Self Assemblies of Variants of Amyloid Peptides.** P. Thiyagarajan<sup>1</sup>, Kun Lu<sup>2</sup>, Jijun Dong<sup>2</sup>, Jaby Jacob<sup>1</sup>, V. Conticello<sup>2</sup>, D.G. Lynn<sup>1</sup>, <sup>1</sup>IPNS, Argonne National Lab, Argonne, IL, <sup>2</sup>Emory Univ., Atlanta, GA.

Alzheimer's Disease, the debilitating neural disease, that leads to the loss of memory and other cognitive functions, is characterized by amyloid plaque deposits in the brain. The primary component in the plaques is a peptide (A $\beta$ ) consisting of 39-43 amino acid residues with a molecular weight of about 5000 Da. Due to its unique amphiphilic character, the peptide self-assembles in aqueous media leading to the formation of well-organized fibrillar structures. Understanding the detailed mechanism of the self assembly of the different variants of A $\beta$  in solution and the structure of these fibrils will be essential for the development of methods for altering or preventing the process of fibrillogenesis. By using solid-state NMR, CD, EM, AFM, biochemical assays and SANS/SAXS, a detailed atomic scale structure of the fibrils formed by A $\beta_{10-35}$  has been developed. Using the detailed framework of the fibril structure, further insight on the role of Zn in the nucleation and growth of the fibrils was achieved. The formation of extremely large tubular structures by the self assembly of smaller variants of the A $\beta$  peptide (A $\beta_{16-22}$ ) sheds light on the relationship between the length of the peptide and the extent of lamination of the  $\beta$ -sheets. The unique supramolecular self-assemblies formed by the variants of A $\beta$  peptide may have interesting applications in the design of unique functional nanostructured systems.

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