

Reversible Self-Assembly of Fluorescein Amyloid Beta Peptides over Gold Colloids

The fiber formation of amyloid beta peptides is known to be an essential step of fibrillogenesis, the hallmark mechanism of Alzheimer's disease. One type of amyloid beta which is critically important in the mechanism of Alzheimer's disease is a hydrophilic amyloid beta of sequences 1-40. A fluorescein-attached amyloid beta monomer (Fa β_{1-40}) of this sequence was used to probe the conformational change of the peptide into its oligomeric formation. The folded and unfolded conformations of the monomer were induced by fluctuating the pH environment between 10 and 4, respectively. This was studied at an interfacial environment using gold colloidal surfaces, ranging between 10 nm and 100 nm in diameter. The bonding dynamics for the Fa β_{1-40} was determined from fluorescence decay times. Faster dynamics were observed in acidic environments as well as in the presence of the larger gold colloids due to an enhancement in fluorescence from the peptide.