Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

A simple system for the identification of fluorescent dyes capable of reporting differences in secondary structure and hydrophobicity among amyloidogenic protein oligomers EMMA YATES, University of Cambridge — Thioflavin T and Congo Red are fluorescent dyes that are commonly used to identify the presence of amyloid structures, ordered protein aggregates. Despite the ubiquity of their use, little is known about their mechanism of interaction with amyloid fibrils, or whether other dyes, whose photophysics indicate that they may be more responsive to differences in macromolecular secondary structure and hydrophobicity, would be better suited to the identification of pathologically relevant oligomeric species in amyloid diseases. In order to systematically address this question, we have designed a strategy that discretely introduces differences in secondary structure and hydrophobicity amidst otherwise identical polyamino acids. This strategy will enable us to quantify and compare the affinities of Thioflavin T, Congo Red, and other, incompletely explored, fluorescent dyes for different secondary structural elements and hydrophobic motifs. With this information, we will identify dyes that give the most robust and quantitative information about structural differences among the complex population of oligomeric species present along an aggregation pathway between soluble monomers and amyloid fibrils, and correlate the resulting structural information with differential oligomeric toxicity.

Emma Yates
University of Cambridge

Date submitted: 11 Nov 2011 Electronic form version 1.4