

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Probing the dynamics of amyloidogenic peptides by dielectric relaxation spectroscopy DONALD BARRY, FIOLEDA PRIFTI, IZABELA STROE — Fibrillar amyloidogenic structures have been considered for a long time indicators of neurodegenerative diseases. However, it has been proposed recently that amyloid oligomers are in fact the cytotoxic form and more importantly, they exhibit dynamics which differ from the fibrillar form due to the structure of water around these molecular structures. Here, we report dielectric relaxation measurements of non-amyloidogenic and amyloidogenic peptides in deionized water as a function of time and concentration. Our preliminary data show that the dielectric relaxation time of mixtures of deionized water and amyloidogenic peptides is a sensitive indicator of a transition state dominated by soluble oligomers to one characterized by the formation of large fibrils. Over time, this transition shifts the dielectric signal towards large relaxation time values, similar to those in bulk-like water as more molecules are liberated when small oligomers form fibrils. This is in agreement with recent theoretical models.¹

¹F. Despa et al., J. Biol. Phys. (2008) 34, 577 and references herein.

Donald Barry

Date submitted: 30 Nov 2009

Electronic form version 1.4