

**Zhefeng Guo, Ph.D.**

University of California, Los Angeles  
Los Angeles, California

## EPR Studies of the Early Events in Aβ<sub>1-42</sub> Aggregation

2009 New Investigator Research Grant

Beta-amyloid (also known as Aβ) is a protein fragment that aggregates into amyloid plaque, a characteristic feature of Alzheimer pathology. Before forming plaques, however, small numbers of beta-amyloid molecules can aggregate into clusters known as oligomers, which are toxic to nerve cells. Beta-amyloid oligomers have become an important focus of research because they may be an important target for drug development. However, very little is known about the structure of beta-amyloid oligomers or the conditions under which they form.

Zhefeng Guo, Ph.D. and colleagues plan to study the structure of beta-amyloid during the formation of oligomers. They are able to put labels on specific parts of the molecule that can be detected using a technique called electron paramagnetic resonance (EPR). Using EPR the researchers are able to determine the structure of beta-amyloid and which parts of the molecule participate in the formation of oligomers. The researchers will also study the size and structure of fully formed oligomers, as well as the distance between individual beta-amyloid molecules. The results of these studies will allow Dr. Guo's team to build molecular models of beta-amyloid oligomers, which may be used to design drugs that block their formation.