NEWS RELEASE

Georgia Tech researchers apply Malvern Zetasizer Nano in novel way to predict protein aggregation

4 January 2012: Malvern, UK: Researchers at the Georgia Institute of Technology School of Chemical & Biomolecular Engineering (Georgia, US) are using the simple to use technique of dynamic light scattering (DLS) measurements to predict otherwise difficult-to-measure aggregation behaviors in proteins. Using the Zetasizer Nano from Malvern Instruments, the Georgia Tech team measures small volumes of stable protein solutions with low concentrations of different salts. From the results they can infer ion-specific trends in the kinetics of aggregation induced by much higher concentrations of the same salts. Such trends, derived from the analysis of non-aggregating samples, could be confirmed experimentally in rapidly aggregating samples of the same protein.

Associate Professor Sven Holger Behrens said, "We use the Malvern Zetasizer DLS option in two ways in our protein studies. The first is a common approach and records the change in hydrodynamic radius [particle size] that occurs as proteins aggregate. Our second, more novel technique, is to look at non-aggregating protein solutions with the same types of salt-ions but much lower salt concentrations. These low salt solutions remain stable for as long as we look at them and we have found that protein interactions in these solutions, visible in DLS as a change in diffusivity [or apparent particle size] with protein concentration, correlate strongly with aggregation stability at much higher concentrations and can therefore predict ion-specific aggregation trends in proteins."

"What makes the Malvern Zetasizer nice is its user friendliness – it takes my students little time to familiarize themselves with this instrument. The fact that you can make these measurements in relatively small sample volumes, facilitated by cuvettes also supplied by Malvern, is also very helpful, as is the instrument's convenient temperature control."

Image to follow…

With co-authors Professor Andreas Bommarius and graduate students Jonathan Rubin and Adriana San Miguel, Professor Behrens published the results of his study titled 'Correlating Aggregation Kinetics and Stationary Diffusion in Protein-Sodium Salt Systems Observed with Dynamic Light Scattering' in the Journal of Physical Chemistry B [2010, 114, 4383–4387]. Malvern's Zetasizer series measures particle and molecular size from below one nanometer to several microns, zeta potential, electrophoretic mobility, and molecular weight. Further information is available at www.malvern.com/zetasizer

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