Boronic Acid Functionalized Gold Nanoparticles for Determining Protein Glycation

D. Kim[1], C. Zhang[1], B. Han[1], and V. Perez-Luna[1]
[1]Illinois Institute of Technology, Chicago, Illinois

The Diabetes Control and Complications Trial (DCCT), a landmark study on the long term complications of diabetes, showed that tight control over blood glucose levels decreased the long term complications associated with this disease. Because of this, determining the effectiveness of controlling blood glucose levels over the long term is important in diabetes management. Determination of hemoglobin glycation is often used to determine long term control over blood glucose levels. Protein glycation has also been associated with complications of diabetes and aging. Because of this, the present work focus on developing probes to determine advanced glycation end products (AGEs), specifically glycated proteins. For this purpose, gold nanoparticles bearing boronic acid groups are created such that they can be used to differentiate between different extents of protein glycation in aggregation based assays. The boronic functionalized nanoparticles can be employed to cause aggregation that is mediated by glycated proteins such that this aggregation can be related to the extent of protein glycation. These novel nanomaterials could make possible the facile and fast determination of protein glycation.
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