

Abstract Submitted
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Characterization of Nanoparticle Aggregation in Biologically Relevant Fluids KATHLEEN MCENNIS, JOERG LAHANN, University of Michigan — Nanoparticles (NPs) are often studied as drug delivery vehicles, but little is known about their behavior in blood once injected into animal models. If the NPs aggregate in blood, they will be shunted to the liver or spleen instead of reaching the intended target. The use of animals for these experiments is costly and raises ethical questions. Typically dynamic light scattering (DLS) is used to analyze aggregation behavior, but DLS cannot be used because the components of blood also scatter light. As an alternative, a method of analyzing NPs in biologically relevant fluids such as blood plasma has been developed using nanoparticle tracking analysis (NTA) with fluorescent filters. In this work, NTA was used to analyze the aggregation behavior of fluorescent polystyrene NPs with different surface modifications in blood plasma. It was expected that different surface chemistries on the particles will change the aggregation behavior. The effect of the surface modifications was investigated by quantifying the percentage of NPs in aggregates after addition to blood plasma. The use of this characterization method will allow for better understanding of particle behavior in the body, and potential problems, specifically aggregation, can be addressed before investing in in vivo studies.

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