

Abstract Submitted
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A Fluorometrical Study of the Impact of Gold Nanoparticles on the Fluidity DMPC Liposomes¹ LANCE EDWARDS, Department of Biological Sciences, Delaware State University, DILLON BADMAN, Department of Physics and Engineering, Delaware State University, FATIMA EDWARDS, Polytech High School, QI LU, Department of Physics and Engineering, Delaware State University — Liposomes are model membrane systems composed of phospholipid bilayers that are the major constituent of cellular membranes. In this study, we aim to understand how nanoparticles affect the integrity of cell membranes by examining the interactions between liposomes and gold nanoparticles (AuNPs). The liposomes were prepared by sonicating 1,2-dimyristoyl-sn-glycero-3-phosphocholine (DMPC) in PBS partitioned with Laurdan (6-lauroyl, 1-2-dimethylamino naphthalene), a hydrophobic fluorescent dye. AuNPs in four different sizes (5, 10, 20 and 30 nm) at various concentrations were introduced to extruded or non-extruded liposomes. The extrusion process allowed for a size uniformity of the liposomes below 100 nm in diameter, confirmed with an IX-71 fluorescence microscope. The emission spectra of Laurdan-labeled liposomes upon AuNP interactions were collected with a K2 spectrofluorometer. The emission peaks at 440 and 490 nm were then used to derive the generalized polarization (GP) functions, which reveal the change of fluidity in the lipid bilayers induced by AuNPs. These changes may lead to new insights on how AuNPs may be used to control the metabolic pathways of lipid membranes in the process of cancer cell adhesion.

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