NANO HIGHLIGHT
NIRT: Probing Viral Adhesion with Nanoengineered Biomembranes and Quantum Dots

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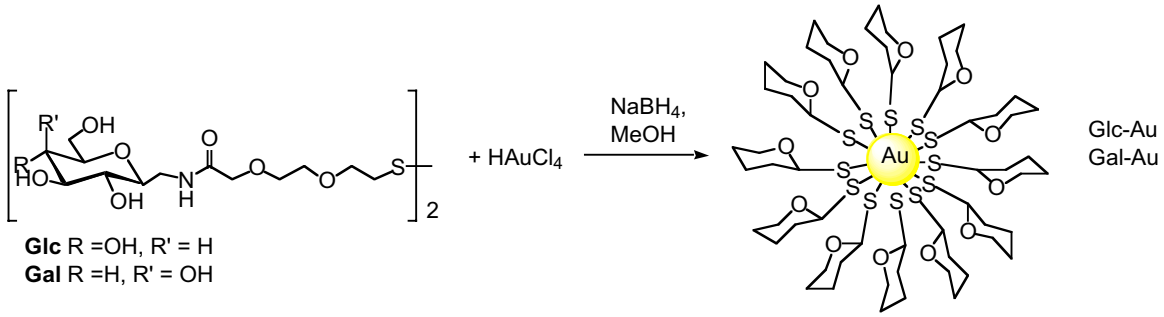
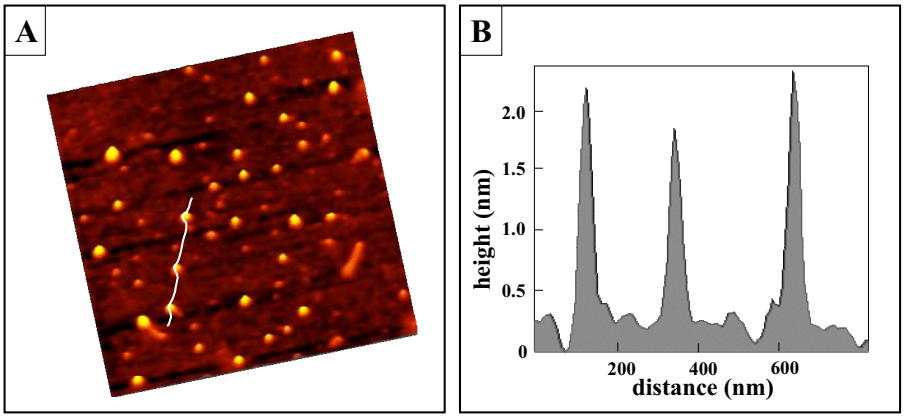
Our research efforts focus on the fundamental and molecular level understanding of viral adhesion. Specifically, we are studying the interactions of the HIV-associated glycoprotein gp120, with the cellular receptor GalCer. Synthetic nanoparticles, Au glyconanoparticles, containing GalCer molecules have been prepared by the Gervay-Hague group.[1] A biotin-NeutrAvidin™ adhesion assay was used to evaluate the relative ability of carbohydrate disulfides and Au glyconanopraticles to displace rgp120 from plate-bound GalCer. These nanoparticles were found to be greater than 300 times more active than the disulfides and at least 20 times more active than biotinylated GalCer. These results collectively demonstrate the potential utility of polyvalent ligand arrays on nanoplatforms and suggests that these types of synthetic particles may be viable inhibitors of HIV infection.[2] The synthetic scheme for the production of the Au gluconanoparticles is shown below along with the Au nanoparticle characterization by Atomic Force Microscopy.





(A) A 1.7x 1.7 μm^2 topographic image. (B) Corresponding cursor profile for the line shown in (A). The cursor profile shows the diameters of the three particles are 2.0 nm, 1.6 nm and 2.1 nm, respectively.

[1]. **"Synthesis of Gold Glyconanoparticels and Biological Evaluation of Recombinant Gp120 Interactions"** Notlting, B.; Yu, J. J.; Liu,G-Y.; Cho, S.-J.; Kauzlarich, S.; Gervay-Hague, J. *Langmuir* **2003**; *19,* 6465-6473.

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