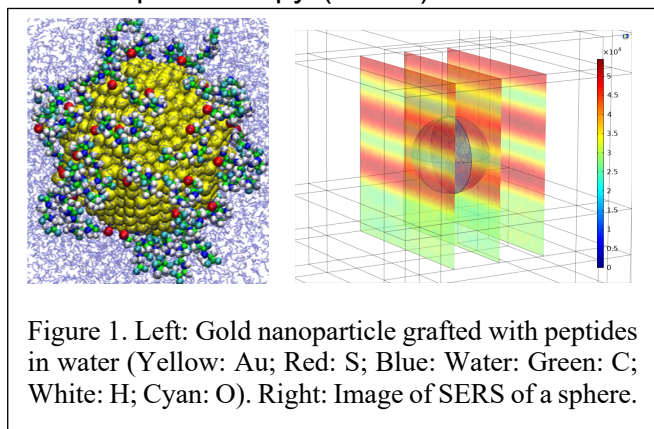


Howard University has at least four openings in the Department of Chemical Engineering for a one-month long **Summer Research Program for Undergraduates**. The program is sponsored by the National Science Foundation under the HBCU-UP program. The research topics are encompassed within the study of gold and silver Nanoparticles interacting with proteins through computational and experimental approaches. In order to develop state-of-the-art detection devices for the medical community, there is a critical need to understand the interactions between nanoparticles and biological agents.

Participants in this program will help further our understanding of the fundamental properties of nanoparticles and their interactions (i.e., binding and optical response) with biologically relevant substituents. There are various potential research projects that include: (1) working on and testing instrumentation using various spectroscopic techniques including surface-enhanced Raman spectroscopy (SERS) to detect chemicals and amino-acids with Dr. Hyung Bae; (2)



synthesis and characterization of gold and silver nanoparticles to be complexed with amino-acids and peptides with Dr. Steven Cummings; (3) modeling the gold and silver nanoparticles complexed with amino-acids and peptides by various computational techniques (Drs. Andre Clayborne, Tao Wei, Xiuping Tao, Hyung Bae). Successful candidates will be enrolled in physics, chemistry, chemical engineering, or a related discipline. Having research laboratory experience or

computational experience is a plus, but not required. It is important that the candidates display good laboratory practices and be willing to learn new techniques and approaches. U.S. Citizenship or permanent residency is a requirement. The program will occur from **May 20, 2019 to June 14, 2019** and will include lectures on research ethics, techniques in synthesis, spectroscopy, and computational modelling. The program will provide travel support, a minimum stipend of \$2000.00 and housing at Howard University.

Applicants should send a cover letter and resume electronically to [nanoparticle19@gmail.com](mailto:nanoparticle19@gmail.com), and arrange for one-letter of recommendation to be sent directly to the same email address. The deadline for applications is March 30, 2019.

Located in the heart of Washington, D.C., Howard University is ranked 89<sup>th</sup> by U.S. News & World Report. It is a culturally diverse, research intensive private historically Black university with an undergraduate enrollment of approximately 6,500. The university houses many professional and graduate programs including those in Chemistry, Chemical Engineering, Mechanical Engineering, Law, and Pharmacy. Howard University is an Equal Employment Opportunity/Affirmative Action employer and values diversity.