abstract
This work aims to characterize protein-nanoparticle interactions through the application of experimental techniques to aid in controlled nanoparticle production for various applications from manufacturing through medical to defense. This included multiple steps to obtain purified and characterized protein and then the production of nanoparticles using the protein. This application of protein requires extremely pure homogenous solution of the protein that was achieved using numerous protein separation techniques. Crystallization conditions, protein separation methods and protein characterization methods were all investigated along with the protein-nanoparticle interaction studies. The main protein of study here is GroEL and the inorganic nanoparticle used is platinum. Some studies on MBP producing gold nanoparticles from an ionic gold precursor were also conducted to get a better perspective on nanoparticle formation. Protein purification methods, crystallization conditions, Car-9 tag testing and protein characterization methods were all investigated along with the focus of this work. This information will be presented in the appendices for further information.