Title:	Amino acid Mediated Synthesis of Different Structural Gold Nanoparticles
Authors:	Ghosal, Abhinil
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Abstract:	In the edge of inter-disciplinary, plasmonic nanoparticle chemistry is one of the versatile topics as it connects several fields from optics to nanomedicine. Though nanoparticles chemistry brings science and technology to the next generation, the chemistry behind the nanoparticles' formation is still not revealed properly due to the lack of instrumentations. From the 1850s to the present day, several researchers synthesize different types of plasmonic nanoparticles as the plasmonic, sensing, catalysis all properties are highly dependent on the size and shape of the nanoparticles. Sharp-edged, high index facets nanoparticles are demanded for catalysis and sensing purpose, whereas different nanoparticles with different LSPR peak is needed for optics. Small size nanoparticles are extremely good for catalysis, SERS sensing, whereas big size nanoparticles are wanted for nano-bio chemistry. Hence, the synthesis of plasmonic nanoparticles is still significant. In the first project, the intention was to develop the approaches to synthesize single chiral nanoparticles by using amino acids on small size nanoparticles having high index facets. The single chiral nanoparticles were discovered (in 2018 by Prof. Ki Tae Nam), where chiral, thiol-containing amino acids were used on the nano seed to observe chirality. Here the same experiment has been performed on tetrahexahedron seed to get chiral nanoparticles. Another new approach has been performed to use a concave cube as a seed and was treated it with a chiral growth solution. In the second project, the differently shaped and size-containing nanoparticles were synthesized in a one-step reaction by using PVP as a capping agent. Following one established reaction by Prof. OOK Park, several modifications like varying concentration, volume, capping agent, reaction times, etc have been done. The unique approach was to use amino acids in the reaction to observe the changes in product structures. PVP is a comparatively cheap and available surfactant than CTAC or other expensive surfactants. Here the most common solvent DMF performed the role of solvent as well as reducing agent simultaneously. 2
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