Molecular Plasmonics and Conductivity

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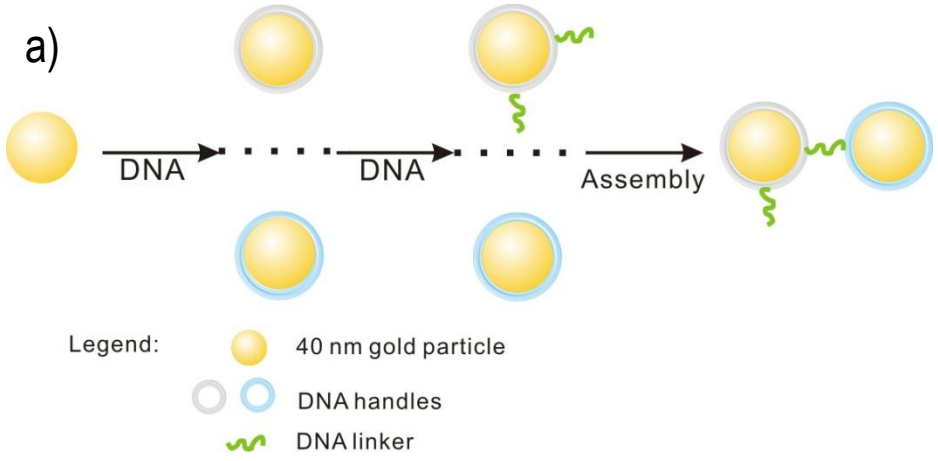

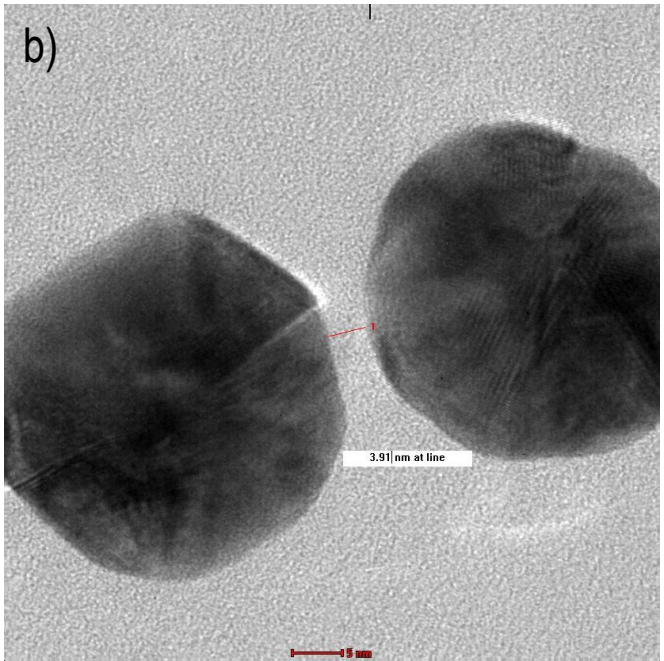

a) Traditional DNA assembly process
b) TEM image of DNA linked nanoparticles

Coupling gold nanoparticles creates a “hot spot” in the electromagnetic field between the particles. This coupling alsom changes the resonance energy depending on the distance between the particles in a predictable manner until the gap is small (> 2 nm). At this range, other effects are causing a change in the trend for the resonance energy shift. We are attempting to determine the cause of this change, mainly through studying the effect of conductivity in the linker material used for the self-assembly process. We currently use dsDNA for the dimerization process, a material that may exhibit some semiconductivity, particularly on the short scale. Through analysis of the DNA dimers, as well as other linker materials, we hope to determine whether the conductivity is a contributing factor.