

Mono-Functionalized Gold Nanoparticles

Selective functionalization of nanostructures with single molecule resolution and stoichiometry is currently a limiting step for the development of a broad range of applications ranging from single molecule electronics to future sensor technologies where the single molecule is used as the sensing unit. This research project focuses on the development of chemistries that allow for chemo-selective functionalization of nanostructures with sub nanometer resolution. This will make it possible to develop advanced single molecule electronics components and nano-biosensors with a digital, single molecule response. In this context, the controllable synthesis of mono-functionalized gold-nanoparticles is an area of intense research. ^[1]

The synthesis of gold nanoparticles is well-known, but separation techniques for the different aggregates are necessary to achieve well-defined nanostructures such as dimers, trimers and more advanced structures. A new method shows, that di- and trimers can be separated from monomers with the help of gravity centrifugation. ^[2]

In this project we would like to combine the gel separation methods with new functional linker molecules which will be synthesized in our lab.

The project requires the motivation to learn new techniques for the characterization of nanostructures as well as interest in nano-chemistry and its applications.

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References:

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