Title: **Synthesis of Au nanoparticles functionalized with thiol-coumarin ligands**

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Metal nanoparticles in general and Au nanoparticles in particular have been very studied in recent years due to the interesting properties they present and that allow their optical, electronic, magnetic, catalytic and biomedical applications. Some other reasons for this interest in Au nanoparticles research are their stability, and that they have been described easy and reproducible synthetic methods that allow a perfect control of the size and polydispersity of gold nanoparticles. In addition, they can be easily functionalized to obtain hybrid systems with new properties.

In this work we describe the synthesis of gold nanoparticles functionalized with ligands that contain a chromophore group, a coumarin, and a thiol group to attach the ligand to the nanoparticle surface. The ligands studied are two, S-(10-((2-oxo-2H-chromen-4-yl)oxy)decyl) ethanethioate (coumarin 1) and 4-mercaptocoumarin (coumarin 2), previously synthesized. Several strategies and reaction conditions have been tested to achieve different degree of functionalization in the final systems. Once synthesized, nanoparticles have been characterized by different techniques like nuclear magnetic resonance and infrared spectroscopy, and thermogravimetry. Finally, the optical properties of the nanoparticles have been studied by UV-Vis and fluorescence spectroscopy.