# Core/Shell Au/Pt nanoparticles as a potential drug delivery system enhancing the optical and anticancer activity, coated with a new drug to target glioblastoma.

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**Abstract**

Drug delivery nanosystems which consist of metal nanoparticles, with exceptional therapeutic and diagnostic abilities, represent a promising strategy to approach various diseases, including cancer. In particular, the properties of heterogeneous bimetallic nanoparticles have attracted great interest because of their unique chemical and physical properties, which derive from the synergic effect of the incorporation of a second metal into a nanoparticle structure. In addition, according to several researches, angiogenesis seems to occur in a diversity of cancers, forming a breeding ground for their growth and spread.

In this work, we present an innovative strategy on the synthesis of bimetallic Au@Pt nanoparticles modified with specific targeting molecules, characterization and *in vitro* evaluation of Au@Pt core@shell nanoparticles. Nanoparticles' functionalization with small molecules is a simple process to target biological tissues. It was our aim to target the cancerous angiogenesis; thus, a small molecule, with quinazoline as core, was synthesized to be used as an inhibitor of the Epidermal Growth Factor Receptor (EGFR) in order to restrict the angiogenesis in glioblastoma. It is used as a model drug, linked with the drug delivery nanosystem. The optical and imaging properties, biocompatibility, as well as anticancer activity of this drug-drug delivery nanosystem were extensively investigated, in vitro.

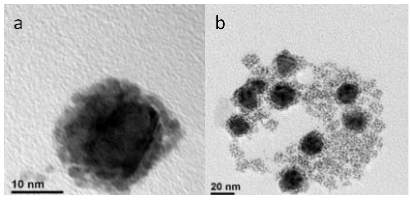


Fig. 1: TEM images of Au@Pt NPs of the first synthetic procedure (A) in the scale of 10 nm (B) in the scale of 20 nm