

Química

Bionanoconjugate characterization

REQUIMTE / Bionano@REQUIMTE



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Objectives

Characterization of Gold Nanoparticle surfaces with different capping agents.

Formation and characterization of bionanoconjugates of Tyrosinase and Gold Nanoparticles in terms of enzymatic activity and conjugation model.

Identification of possible binding site on the Tyrosinase structure.

Methodology

Gold Nanoparticle with different capping agents are characterized by pH induced aggregation and Agarose Gel Electrophoresis (AGE).

The bionanoconjugates formation is analyzed with Dynamic Light Scattering (DLS), AGE with Ferguson analysis and with pH induced aggregation.

Conjugated Tyrosinase activity is measured by UV/Vis spectroscopy.

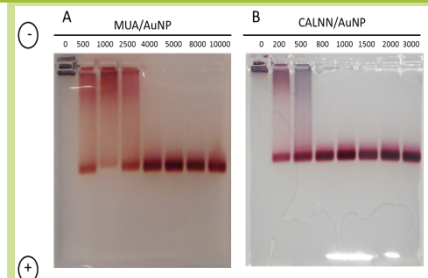
Expected Results

Identification of the optimal molar ratio of capping agent to Gold Nanoparticle.

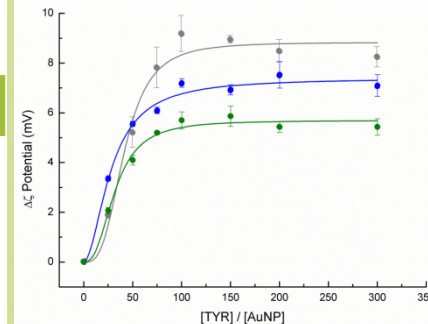
Avaliation of the conjugation parameters obtained by fitting the experimental DLS and AGE data to a cooperativity adsorption model.

Determination of the effect of the conjugation on the Tyrosinase activity.

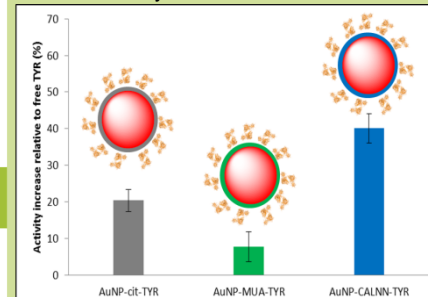
Identification of the positive electrostatic region that possibly conjugates with the negative Gold Nanoparticle surface.



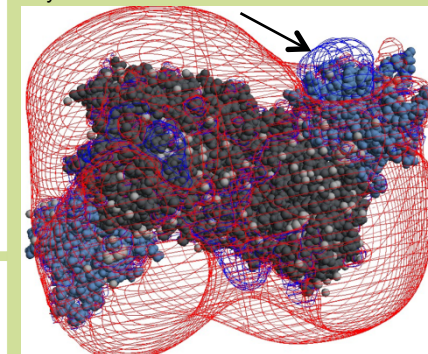
AGE of Gold Nanoparticle with increasing amounts of capping agent



DLS of Gold Nanoparticle with increasing amounts of Tyrosinase



Activity increase of the bionanoconjugates relative to free Tyrosinase



Electrostatic field distribution at Tyrosinase surface. Exposed position identified with an arrow.