

Chemistry Department

Malaria BioNanoDiagnosis

Requimte / Bionano@REQUIMTE

Collaborations: Malaria Unit, Instituto de Medicina Molecular and Requimte, Chemistry Department, Faculdade de Ciências da Universidade do Porto



Inês Gomes

Pos-doc Research

PhD in Inorganic Chemistry by Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa

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ines.gomes@fct.unl.pt

Objectives

Design a gold nanoparticle (AuNP)-based rapid diagnostic test using poly or monoclonal antibodies to detect *Plasmodium falciparum* (malaria parasite) specific antigens in clinical samples.

Master's thesis of Isabel Silva.

Methodology

Synthesis and functionalization of AuNPs

Selection of antibodies based on *Plasmodium falciparum* antigen screening

Preparation of bionanoconjugates of functionalized AuNPs / antibodies

Evaluation of bionanoconjugates in an assay format: lateral flow strip immunoassay and fluorescence quenching immunoassay

Expected Results

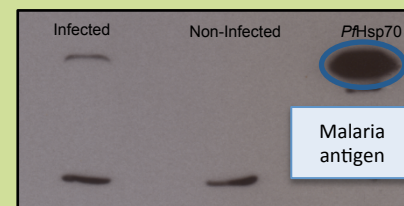
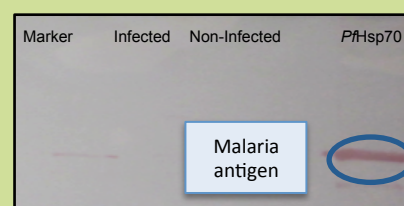
Prove the bionanoconjugates' formation by using an agarose gel electrophoresis, dynamic light scattering and zeta potencial measurements.

Identification of antibodies according to the *Plasmodium falciparum* antigens most abundant in the blood/plasma of individuals infected with malaria. The antigens will be identified by mass spectrometry (MALDI-TOF-MS), collaboration with Dr. Mário Diniz, Chemistry Department, FCT-UNL.

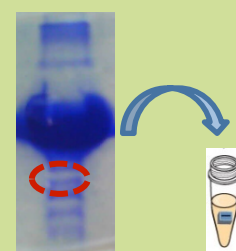
Development of a simple lateral flow test and fluorescence quenching competitive immunoassay for malaria antigens detection.

Funding:

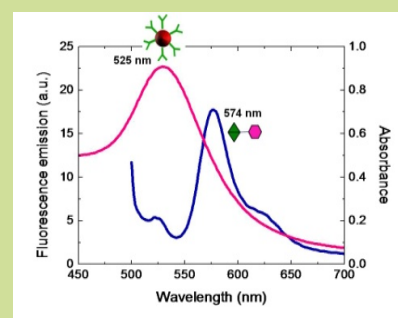
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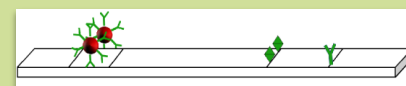
Western blot analysis



MALDI-TOF-MS: In-gel protein digestion



Fluorescence immunoassay



Lateral flow strip immunoassay