*Poster*

# COLORIMETRIC ASSAY FOR A SWIFT DETECTION OF NUCLEIC ACIDS

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Nowadays, the impact of new nanotechnologies is particularly large in biodiagnostics, where a number of nanoparticle-based assays have been introduced for biomolecule detection. In particular, colloidal gold nanoparticles have been used to develop a new class of nano-biosensors able to recognise and detect specific DNA and/or RNA sequences [1, 2, 3, 4]. These gold nanoparticles are labelled with specific oligonucleotides DNA by means of a thiol covalent bond ("gold nanoprobes"). Our approach has been the development of a simple, easy-to-use and inexpensive colorimetric assay for specific DNA and/or RNA sequence detection based on gold nanoprobes. The stability of these nanoprobes is enhanced when they hybridise with the complementary DNA and/or RNA target in solution, while non-hybridised nanoprobes easily aggregate once the solution's ionic strength is increased. The aggregation of the nanoprobes is accompanied by a change of colour from red to blue, providing the means for detection (see Figure 1). The assay has been successfully applied to detect eukaryotic gene expression without retro-transcription or PCR amplification [3]; in a fast and straightforward assay for *Mycobacterium tuberculosis* DNA detection in clinical samples [4]; and to detect β-globin gene single point mutations, responsible for β-thalassaemia, and other human single nucleotide polymorphisms (SNPs). Transmission Electron Microscopy (TEM) is being used to characterise the morphology and dimensions of the nanoprobes, while Atomic Force Microscopy (AFM) imaging allows us to measure high resolution topographic images for characterisation of the steps involved in the formation of gold nanoprobe-DNA aggregates (see Figure 2). This assay shows great potential for point-of-care diagnostics.

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**References:**

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**Figures:**

Figure 1

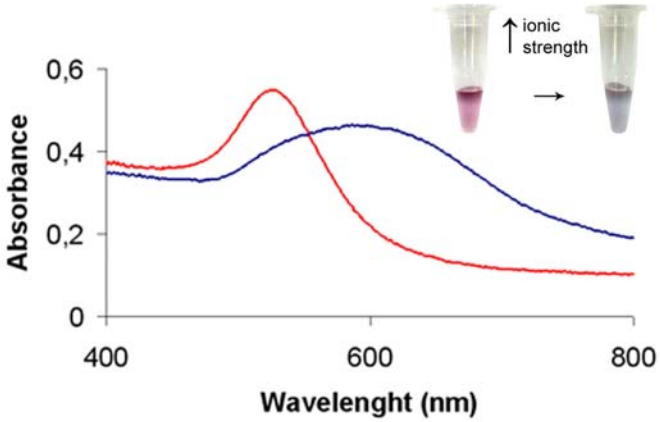


Figure 2