#2002 - Spectrophotometric and visually detection of DNA sequences from Chlamydia trachomatis based on electrostatic interactions with unmodified gold nanoparticles

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Body

Introduction: *Chlamydia trachomatis,*a pathogen responsible for diseases of
significant clinical and public health importance. The majority of afflicted persons are unaware of their infection and they would not prompt to seek medical care. Consequently, a variety of costly or even irrecoverable complications such as infertility may be inescapable. Hence, urgent identifying and treatment is required. There are different conventional methods for the DNA based diagnosis of this pathogen, such as multiplex PCR and Real-time PCR assay and so on, but direct detection methods that provide quick, accurate, simple and cost effective devices to be used outside a laboratory are highly desired. Herein, we present the development of a colorimetric method that relies on the use of gold nanoparticles for fast and specific detection of *Chlamydia trachomatis* dispensing with the need for DNA amplification.

Material and methods: First, gold nanoparticles (GNPs) were synthesized using the citrate reduction method andconjugated with the prepared probe to develop the new nano-biosensor. Next, the extracted target DNA ofthe bacteria was added to GNP-probe complex to check its efficacy for *Chlamydia trachomatis* diagnosis.

Results and discussion: The visual and/or spectrophotometric comparison of solutions before and after acid induced AuNP-probe aggregation reveal the results. The presence of a complementary target prevents aggregation

and the solution remains pink, whereas on the contrary event it turns to purple.The application of the offered method on isolated bacteria produced positive results with the *Chlamydia trachomatis* isolates and negative with the controls.

Conclusion: Briefly, we have developed a facile method for detecting of DNA sequences from *Chlamydia trachomatis*, using stable DNA-functionalized gold nanoparticles. The hybridization causes change in optical properties of gold nanoparticles reported here opens up a new possibility of rapid, easy, reliable and label free genetic diagnosis. Further, the developed colorimetric detection method can be used to detect genomic DNA of various pathogens.

Keywords: *Chlamydia trachomatis,* Gold Nanoparticles, Colorimetric assay, DNA probe

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