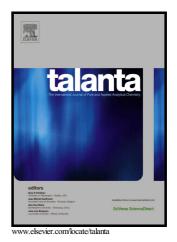
## Author's Accepted Manuscript

Detection of multiple organisms based on the distance-dependent optical properties of Gold Nanoparticle and dark-field microscopy

Nongthombam Boby, Syed Atif Ali, P Preena, Gurpreet Kaur, Satish Kumar, Pallab Chaudhuri



 PII:
 S0039-9140(18)30566-6

 DOI:
 https://doi.org/10.1016/j.talanta.2018.05.074

 Reference:
 TAL18715

To appear in: Talanta

Received date: 19 April 2018 Revised date: 21 May 2018 Accepted date: 22 May 2018

Cite this article as: Nongthombam Boby, Syed Atif Ali, P Preena, Gurpreet Kaur, Satish Kumar and Pallab Chaudhuri, Detection of multiple organisms based on the distance-dependent optical properties of Gold Nanoparticle and dark-field microscopy, *Talanta*, https://doi.org/10.1016/j.talanta.2018.05.074

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

### ACCEPTED MANUSCRIPT

## Detection of multiple organisms based on the distance-dependent optical properties of Gold Nanoparticle and dark-field microscopy

Nongthombam Boby<sup>1</sup>, Syed Atif Ali<sup>2</sup>, Preena P<sup>3</sup>, Gurpreet Kaur<sup>2</sup>, Satish Kumar<sup>1</sup>, Pallab Chaudhuri<sup>2</sup>\*

<sup>1</sup>Division of Biotechnology, Indian Veterinary Research Institute, Izatnagar-243122, India

<sup>2</sup>Division of Bacteriology and Mycology, Indian Veterinary Research Institute, Izatnagar-243122, India

<sup>3</sup>Division of Medicine, Indian Veterinary Research Institute, Izatnagar-243122, India

\*Corresponding author: pallab.chaudhuri@gmail.com

#### Abstract

Owing to their unique physical and chemical properties like stability, non-toxic, biocompatibility and feasible to modification with various biomolecules, gold nanoparticle has become a versatile nanomaterial in the field of therapeutic, diagnostic and analytical studies. Various surface plasmon resonance based pathogen detection systems, relying on change in colour, have been proposed. However, all the approaches developed so far were designed for the detection of a single pathogen. In the present study, we have designed a new colorimetric approach based on distant-dependent properties of gold nanoparticle for the detection of multiple targets. A modified multiplex asymmetric PCR in which a universal primer amplifies the multiple targets with the same efficiency was performed. The Limit of detection (LOD) of the designed visual assay is 10 pg of Brucella and Leptospira target DNA and 100 pg of Bovine herpes virus-1 (BoHV-1) target DNA. LOD of 0.5 pg, 0.7 pg and 3.8 pg for Brucella, Leptospira and BoHV-1 respectively was obtained spectrophotometrically. A study on dark field microscopy as a qualitative supporting detection system has also been presented in this study. The designed assay has advantages over earlier reports in terms of multiple organisms detection, specificity Accer and sensitivity of the test.

Graphical abstract

Download English Version:

# https://daneshyari.com/en/article/7675881

Download Persian Version:

https://daneshyari.com/article/7675881

Daneshyari.com