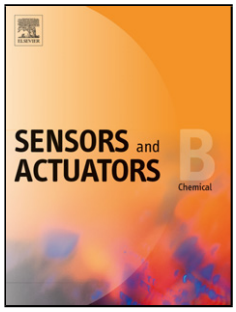

Title: Drug and Nanoparticle mediated rapid naked eye water test for Pathogens detection

Authors: Pargat Singh, Ritika Gupta, Megha Choudhary, Anil Kumar Pinnaka, Rajesh Kumar, Vijayender Bhalla

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Corresponding Author: Dr. Vijayender Bhalla, Ph.D

Corresponding Author's Institution:

First Author: Pargat Singh

Order of Authors: Pargat Singh; Ritika Gupta; Megha Choudhary; Anil Kumar Pinnaka; Rajesh Kumar , PhD; Vijayender Bhalla, Ph.D

Abstract: Abstract
Inspired by the interaction of colistin with lipopolysaccharides (LPS) of the bacterial outer membrane, we describe a simple, cost effective and rapid assay for the detection of bacterial contamination in water samples. Colistin, a bactericidal drug, has been used by us in a receptor configuration for detection of pathogenic microorganisms without involving any tedious sample preparation step. The approach employs the cationic antibiotic drug for dual purpose, firstly, as a primary binder for pathogens and secondly, as an aggregator for negatively charged Gold nanoparticles (GNPs). The former consists of colistin binding to bacteria in water that renders GNPs free in solution thus depicting red color and the latter shows colistin driven aggregation of GNPs producing blue colored solution. The assay works in a two-step procedure that involves addition of colistin and GNPs to the water sample before results can be visualized based on color change. The assay is sensitive at a concentration up to 10 bacterial cells*mL-1 in a time frame of 5 minutes without requiring any expensive reagents and instruments.