

## Abstract

The sensitive and rapid diagnostic techniques are critical for clinical diagnosis and control of disease causing by bacterial pathogens. Although the conventional diagnostic methods are powerful and have high accuracy, but most of these methods are difficult, time consuming and complicated. This techniques do not have acceptable sensitivity and specificity for diagnosis of organism. In contrast, application of new methods for example gold nanoparticle probes have high specificity and sensitivity in diagnosis of infectious diseases. *Acinetobacter baumannii* is an important nosocomial pathogen, especially in patients with critical conditions. The capacity of this bacterium to survive in hospital environment and acquire antimicrobial resistance represents a major clinical challenge regarding treatment of infections causing by this bacterium. This study was performed to detect *Acinetobacter baumannii* ATCC 19606 by PCR and gold nanoparticles probe. *Acinetobacter baumannii* ATCC 19606 was obtained from Clinical Microbiology Research Center, Shiraz. The bacterium was cultured on Mueller hinton agar medium and bacterial DNA was extracted by boiling method. In next step, Multiplex PCR was used for detection of *Acinetobacter baumannii* by *ompA* and *csuE*, and Crosslinking and Non-crosslinking methods according to nanogold particles. The PCR results showed 299bp and 105bp bands on agarose gel for *ompA* and *csuE* genes, respectively. Detection of bacterium by gold nanoparticles was performed by color alteration between positive and negative samples. In Crosslinking method positive sample and in Non-crosslinking negative sample showed purple color. In Crosslinking method negative sample and in Non-crosslinking positive sample showed red color, primary color. Gold nanoparticles-based methods are simple and cost effective methods for detection of pathogens and do not require special instruments, hence this method could be applied widespread as diagnosis method.

**Keywords:** *Acinetobacter baumannii*, Multiplex PCR, *ompA* gene and *csuE* gene.



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# **Detection of *Acinetobacter baumannii* by Multiplex PCR and gold nanoparticles**

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