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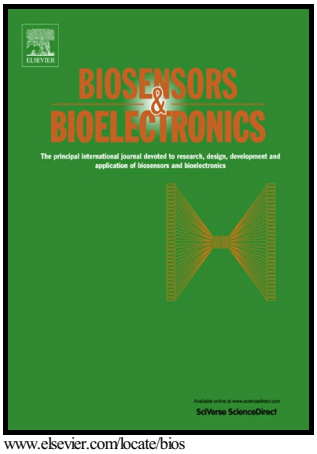

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Recent advances in biosensor based diagnosis of Urinary Tract Infection

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Abstract:

Urinary tract infections (UTIs) are potentially life threatening infections that are associated with high rates of incidence, recurrence and mortality. UTIs are characterized by several chronic infections which may lead to lethal consequences if left undiagnosed and untreated. The uropathogens are consistent across the globe. The most prevalent uropathogenic gram negative bacteria are *Escherichia coli*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Klebsiella pneumonia*. Early detection and precise diagnosis of these infections will play a pivotal role in health care, pharmacological and biomedical sectors. A number of detection methods are available but their performances are not upto the mark. Therefore a more rapid, selective and highly sensitive technique for the detection and quantification of uropathogen levels in extremely minute concentrations need of the time. This review brings all the major concerns of UTI at one's doorstep such as clinical costs and incidence rate, several diagnostic approaches along with their advantages and disadvantages. Paying attention to detection approaches with emphasizing biosensor based recent developments in the quest for new diagnostics for UTI and the need for more sophisticated techniques in terms of selectivity and sensitivity is discussed.

Keywords: Urinary tract infections, Uropathogens, Detection, Biosensors

1. Introduction

Biosensors are biological sensing molecules that are associated with a transducer, which produces signals that are proportional to specific analyte concentration (Turner., 2013). Biosensors are used in modern biotechnology to detect cellular substrates such as enzymes (Kim et al., 2016), proteins (Chang et al., 2016), hemoglobin (Yazdanpanah et al., 2015); chemicals such as mercury (Li et al., 2016), acrylamide (Batra et al., 2016); activity of toxins (Boczek et al., 2015; Das et al., 2015a); and different pathogens such as food pathogens (Adley et al., 2015), waterborne pathogens (Bridle et al., 2014) and uropathogens (Altobelli et al., 2015; Liu et al.,