

## Author's Accepted Manuscript

Preparation, characterization and application of urease nanoparticles for construction of an improved potentiometric urea biosensors

Seema Jakhar, C.S Pundir



PII: S0956-5663(17)30611-5  
DOI: <http://dx.doi.org/10.1016/j.bios.2017.09.005>  
Reference: BIOS9979

To appear in: *Biosensors and Bioelectronic*

Received date: 3 July 2017  
Revised date: 1 September 2017  
Accepted date: 4 September 2017

Cite this article as: Seema Jakhar and C.S Pundir, Preparation, characterization and application of urease nanoparticles for construction of an improved potentiometric urea biosensors, *Biosensors and Bioelectronic*, <http://dx.doi.org/10.1016/j.bios.2017.09.005>

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.

## Preparation, characterization and application of urease nanoparticles for construction of an improved potentiometric urea biosensors

Seema Jakhar, CS Pundir\*

*Department of Biochemistry, M.D.University, Rohtak-124001, India*

Running Title: Enzyme nanoparticles based urea biosensor

\*Corresponding author at: Department of Biochemistry, M D University, Rohtak-124001, Haryana, India. Fax: 91-126274640, Tel.: +91 9416492413

E-mail address:chandrapundir@gmail.com

### ABSTRACT

The nanoparticles (NPs) aggregates of commercial urease from jack beans (*Canavalia ensiformis*) were prepared by desolvation and glutaraldehyde crosslinking and functionalized by cysteamine dihydrochloride. These enzyme nanoparticles (ENPs) were characterized by transmission electron microscopy (TEM), UV and Fourier transform infrared (FTIR) spectroscopy. The TEM images of urease NPs showed their size in the range, 18-100 nm with an average of 51.2 nm. The ENPs were more active and stable with a longer shelf life than native enzyme molecules. The ENPs were immobilized onto chitosan (CHIT) activated nitrocellulose (NC) membrane via glutaraldehyde coupling with 32.22 % retention of initial activity of free urease NPs with a conjugation yield of 1.63 mg/cm<sup>2</sup>. This NC membrane was mounted at the lower/sensitive end of the ammonium ion selective electrode (AISE) with O-ring and then

Download English Version:

<https://daneshyari.com/en/article/5030787>

Download Persian Version:

<https://daneshyari.com/article/5030787>

[Daneshyari.com](https://daneshyari.com)