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PII: S0141-0229(16)30151-X
DOI: http://dx.doi.org/doi:10.1016/j.enzmictec.2016.08.007
Reference: EMT 8955

To appear in: *Enzyme and Microbial Technology*

Received date: 28-6-2016
Revised date: 3-8-2016
Accepted date: 9-8-2016

Please cite this article as: Kitching Michael, Choudhary Priyadarshani, Inguva Saikumar, Guo Yina, Ramani Meghana, Das Sujoy K, Marsili Enrico.Fungal surface protein mediated one-pot synthesis of stable and hemocompatible gold nanoparticles.*Enzyme and Microbial Technology* http://dx.doi.org/10.1016/j.enzmictec.2016.08.007

Fungal surface protein mediated one-pot synthesis of stable and hemocompatible gold nanoparticles

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Abstract

Despite their large secretome and wide applications in bioprocesses, fungi remain underexplored in metal nanoparticles (MNP) biosynthesis. Previous studies have shown that cell surface proteins of *Rhizopus oryzae* play a crucial role in biomineralization of Au(III) to produce gold nanoparticles (AuNPs). Therefore, it is hypothesized that purified cell surface protein may produce *in vitro* AuNPs with narrow size distribution for biomedical and biocatalytic applications. However, different protein extraction methods might affect protein stability and the AuNP biosynthesis process. Herein, we have explored the extraction of cell surface proteins from *R. oryzae* using common detergents and reducing agent (sodium dodecyl sulfate (SDS) Triton X-100, and 1,4-dithiothreitol (DTT)) and their effect on the size and shape