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Title: Enzymatic formation of gold nanoparticles by submerged culture of the basidiomycete *Lentinus edodes*

Author: Elena P. Vetchinkina Ekaterina A. Loshchinina
Andrey M. Burov Lev A. Dykman Valentina E. Nikitina



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1 Enzymatic formation of gold nanoparticles by submerged culture of the
2 basidiomycete *Lentinus edodes*

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4 Elena P. Vetchinkina, Ekaterina A. Loshchinina*, Andrey M. Burov,
5 Lev A. Dykman, Valentina E. Nikitina

6

7 *Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of*
8 *Sciences, 13 Prospekt Entuziastov, Saratov 410049, Russia*

9 *Corresponding author. Tel: #(845-2) 97-04-03; 97-03-27; fax: #(845-2) 97-03-83; 97-04-44.

10 *E-mail address: loshchinina@yandex.ru (Ekaterina A. Loshchinina)*

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12 **Highlights**

- 13 • *Lentinus edodes* can reduce Au(III) from HAuCl₄ to Au(0), forming
14 nanoparticles
- 15 • Au(0) accumulated on the surface and within the hyphae as 5-50 nm
16 nanospheres
- 17 • The fungal phenol oxidases were found to be involved in the Au reduction

18

19 **A B S T R A C T**

20 We report for the first time that the medicinal basidiomycete *Lentinus edodes* can reduce Au(III)
21 from chloroauric acid (HAuCl₄) to elemental Au [Au(0)], forming nanoparticles. Several
22 methods, including transmission electron microscopy, electron energy loss spectroscopy, X-ray
23 fluorescence, and dynamic light scattering, were used to show that when the fungus was grown
24 submerged, colloidal gold accumulated on the surface of and inside the mycelial hyphae as

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