



**Serbian Biochemical Society  
Sixth Conference**

*"Biochemistry and Interdisciplinarity: Transcending the Limits of Field"*

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2. Pasumarthi R, Chandrasekaran S, Mutnuri S. Biodegradation of crude oil by *Pseudomonas aeruginosa* and *Escherichia fergusonii* isolated from Goan coast. *Marine Poll Bull* 2013;76:276-82.
3. Karadžić I, Masui A, Fujiwara N. Purification and characterization of a protease from *Pseudomonas aeruginosa* growth in cutting oil. *J Biosci Bioeng* 2004;98:145-52.

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## ***In vivo* toxicity of naked and coated CeO<sub>2</sub> nanoparticles**

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The use of nanomaterials in various commercial products and industrial processes has increased. Although the application of nanoparticles has great importance, some of them can be risky to human health and the environment. Cerium oxide nanoparticles CeO<sub>2</sub> have been extensively investigated due to the excellent oxygen storage capacities on the basis of the redox transition between Ce<sup>3+</sup> and Ce<sup>4+</sup> and formation of oxygen vacancies on their surface. The effect of CeO<sub>2</sub> on individual organisms and the ecosystem in general are not sufficiently explored.

In this research we used CeO<sub>2</sub>, naked and coated with three different carbohydrates (glucose, pullulan or levan), to study their effect in three different model systems. We analyzed bioluminescence in gram-negative bacterium *Vibrio fischeri*, and acute toxicity in crustacean *Daphnia magna* and zebrafish *Danio rerio*. In all experiments the concentration of CeO<sub>2</sub> nanoparticles was 200 mg/L. For all used types of nanoparticles, we observed bioluminescence inhibition of around 20%. The mortality rate of treated *D. magna* was 6.7% for glucose coated CeO<sub>2</sub>, 9.2% for naked and pullulan coated CeO<sub>2</sub> and 18.2% for levan coated CeO<sub>2</sub>. Despite the adherence of nanoparticles aggregates to the outer surface of the chorion, no acute toxicity was observed for zebrafish embryos during the first 72 h post fertilization. We also did not observe increased level of abnormalities among treated embryos during the first 72 h post fertilization.

In this study, no toxic effects of CeO<sub>2</sub> nanoparticles were observed, but the extent of uptake of nanoparticles remains to be investigated. The effect of chronic exposure to CeO<sub>2</sub> should also be analyzed.

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