Alexander A. Kamnev [1,2]

[1]*Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Federal Scientific Centre of the Russian Academy of Sciences, Saratov, Russian Federation*

[2]*Institute of Biophysics, Siberian Branch of the Russian Academy of Sciences, Federal Scientific Centre «Krasnoyarsk Scientific Centre of the Siberian Branch of the Russian Academy of Sciences», Krasnoyarsk, Russian Federation*

Microbial reduction of selenite with the formation of Se(0) nano-structures

ABSTRACT

Microbial transformation of soluble toxic selenium oxyanions is widespread; Se(0) nano-structures (SeNS) are the main products. Such biogenic nano-sized Se(0) particles have wide applications in nanobiotechnology, food and medical industry, etc. Studying the bioreduction in situ (in bacterial biomass) is challenging; much information can be obtained using Raman spectroscopy sensitive to the chemistry and allotropic states of SeNS [1]. For luminous photobacteria, selenite also influences their bioluminescence [2], which can be used as a toxicity test, while selenite bioreduction to Se(0) is a way to detoxify it [1, 2]. In this talk, examples of these processes will be illustrated and discussed. (Supported by grant # 26-14-20001 from the Russian Science Foundation and Krasnoyarsk Regional Fund of Science, Krasnoyarsk, Russia.)

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BIOGRAPHY

Prof. Kamnev graduated with a MS in chemistry from Saratov State University (SSU), Russia (1980). He studied physicochemical and electrochemical properties of 3d-metal hydroxides in alkaline media at SSU and received his Cand.Sci./PhD in 1992 from SSU. In 1992, he moved to the title Institute (Russian Academy of Sciences, Saratov), and since then he has been leading scientific projects at the Laboratory of Biochemistry, developing molecular spectroscopic approaches in biochemistry/microbiology. In 2002, he obtained a DSc in physical chemistry from SSU. He has published over 140 articles in SCI(E)/Scopus journals, serving also in Editorial/Advisory Boards of three international journals (of quartiles Q1).