Deinococcus radiodurans R1 APPLICATION LIMITS FOR BIOREMEDIATION

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Of all organisms, the bacterium *D. radiodurans* is the most radiation-resistant one and is currently being engineered for remediation of toxic metals and organic components of environmental wastes. Engineered radiation-resistant microorganisms are a renewable source to recover radionuclides/heavy metals from radioactive wastes, much cheaper than the usual chemical processes. Thus, understanding the physiological parameters of *D. radiodurans* is essential for evaluating its application in bioremediation. We have assessed the ability of *D. radiodurans* to grow in the presence of specific toxic contaminants, in their oxidation states that predominate in the environment. Growth of *D. radiodurans* was inhibited at the following metal concentrations: 1.8 mM Cd(II), 32 mM Fe(III), 0.03 mM Co(II), 2.5 mM Zn(II), 0.08 mM Cu(II), 0.012mM Pu(IV) and 0,71 mM Hg(II). These results suggest that this microorganism may be used for bioremediation under certain metal-contaminated conditions. Therefore, to obtain a cell-surface system that adsorbs metals, we constructed a gene fusion of the signal peptide and the surface anchor portions of the protein A gene of *Staphylococcus aureus* (*spa*), flanking the coding sequence of the EC20 phytochelatin synthetic gene. This chimerical gene has been successfully inserted in an *Escherichia coli* vector and will next be placed under the control of the chaperonin GroES-*D. radiodurans* promoter.

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