

Response of the biomining *Acidithiobacillus ferrooxidans* to high cadmium concentrations

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© 2018 Elsevier B.V. Cadmium is a heavy metal present in contaminated soils. It has no biological role but when entering cells generates DNA damage, overexpression of stress response proteins and misfolded proteins, amongst other deleterious effects. *Acidithiobacillus ferrooxidans* is an acidophilic bacterium resisting high concentrations of heavy metals such as cadmium. This is important for industrial bioleaching processes where Cd +2 concentrations can be 5?100 mM. Cadmium resistance mechanisms in these microorganisms have not been fully characterized. *A. ferrooxidans* ATCC 53993 contains genes coding for possible metal resistance determinants such as efflux systems: P-type ATPases, RND transporters and cation diffusion facilitators. In addition, it has extra copies of these genes in its exclusive genomic island (GI). Several of these putative genes were characterized in the present report by determining their transcriptional expression profiles and functionality. Moreover, an iTRAQ p