Speciation of Se(IV) and Eu(III) associated with *Stenotrophomonas bentonitica* BII-R7 isolated from Spanish bentonites

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Deep geological repositories (DGR) are designed to store radioactive wastes in the near future using artificial barriers like bentonites. These formations have been characterized by their high microbial diversity and activity [1]. Consequently, bentonite microbial populations would interact with radionuclides stored within DGR affecting their fate and behaviour.

This study is focused on the elucidation of the mechanism involved in the interactions of Se(IV) and Eu(III) with the bacterial strain *Stenotrophomonas bentonitica* BII-R7 under anaerobic and alkaline conditions using multidisciplinary approach combining microscopy, microbiology and spectroscopy. This strain was isolated from bentonites of Cabo de Gata (Almeria, Spain) [2].

The isolate BII-R7 is able to reduce Se(IV) to Se(0) under DGR relevant conditions forming Se nanoparticles (Se NPs). Size, structure, morphology and cellular location of the Se NPs were analysed by STEM/HAADF, FESEM, UV-Vis spectroscopy, etc. In addition, flow cytometry studies were conducted to evaluate the toxicity of Se(IV) on cell viability and metabolic activity. *S. bentonitica* is also able to interact with Eu(III) mainly by a biosorption process as indicated spectroscopic, microscopic and kinetic studies. Time-Resolved Laser-induced Fluorescence Spectroscopy (TRLFS) results also suggested that phosphoryl and carboxyl groups from the cells have an important role in the Eu(III) coordination sites.

[1] Lopez-Fernandez et al. (2014) Appl Geochem **49**, 77-86.

[2] Sanchez-Castro et al. (2017) Int J Syst Evol Microbiol [in revision].