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Biomineralization of platinum by microorganisms

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The biogeochemical cycling and mobility of platinum (Pt) in the environment have only recently been investigated. In particular, to date the interactions of microorganisms with Pt remain largely unknown. Understanding microbial interactions with platinum will lead to greater understanding of the biogeochemical cycling of Pt which will be crucial in determining biochemical pathways of Pt biomineralization. This study aimed to address this gap in our knowledge by assessing the differences in uptake of Pt complexes between the heavy metal-resistant bacteria *Cupriavidus metallidurans* and non-heavy metal resistant bacteria *Escherichia coli*. Sand columns inoculated with the bacteria and containing Pt were used to assess the interactions between bacteria and Pt. Results during the 126 day experiment provide evidence of bacteria playing an important role in platinum biomineralization. Scanning electron microscopy observed the formation of platinum nanoparticles by both bacteria. These platinum nanoparticles were found to be similar to those naturally occurring. This work highlights the potential role of microorganisms in the biogeochemical cycling of Pt.

Biography

Sahar Saad Shar is a PhD candidate in the School of Science, Royal Melbourne Institute of Technology (RMIT University) working under the supervision of Andrew Ball, Director of the RMIT Centre for Environmental Sustainability and Remediation. Her research focuses on the determination of gold and platinum mobility in the environment with a focus on determining the roles of microbes. She holds a Master's degree in Biotechnology from Flinders University in Adelaide. She also holds a Bachelor's degree from Baha University Saudi Arabia.

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