

Natural Sciences Seminar Series

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Evaluating the toxicity of metal nanoparticles against microorganisms in vivo and in vitro: An interdisciplinary research

Abstract: Engineered nanoparticles (NPs) are one of the emerging anthropogenic contaminants and not much information is available on its environmental toxicity. It is known that the conditions used to measure the toxicity plays a critical role in determining the toxicity of NPs.

Scientifically, it would be a challenging task to study in detail the toxicity of each NP under range of environmental conditions. Statistical Design of Experiments (DOE), allows us to obtain more information on the toxicity of contaminants under wide array of conditions without the need to carry out more experiments. Using copper and cerium oxide NPs as the contaminants and E. coli as the target organism, all the stages of DOE will be illustrated. This includes selecting the correct experimental points, and analyzing the reliability of measurement and robustness of the obtained regression model. Field studies using copper NPs shows the migration of NPs through soil matrix and the ability of these potential pollutants to influence the composition of microbial community.

A reception will follow afterwards