



***“Gheorghe Asachi” Technical University of Iasi, Romania***



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*Session 5*

***NANOMATERIALS FOR BIOTREATMENTS AND NANOPARTICLE IMPACTS  
ON THE ENVIRONMENT***

*Main lecture*

**ENVIRONMENTAL IMPLICATIONS AND APPLICATIONS OF  
NANOTECHNOLOGY: LESSONS LEARNED FROM BACTERIAL-  
NANOPARTICLE INTERACTIONS**

**Pedro J.J. Alvarez**

*Department of Civil & Environmental Engineering, Rice University, Houston, TX. 77005, USA*

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**Abstract**

The production and use of nanomaterials in commercial products is rapidly outpacing the development of knowledge and appropriate regulations to mitigate potential risks associated with their release to the environment. Therefore, it is important to understand how engineered nanoparticles with high probability of environmental release behave and interact with microorganisms, which form the basis of all known ecosystems and provide many critical environmental services. On the other hand, many nanomaterials also hold a significant potential to develop new capabilities to alleviate past and future environmental challenges, including a growing need for water disinfection and microbial control. This presentation will consider the antibacterial properties and mechanisms of fullerenes and other nanomaterials within the context of environmental implications and applications. Research needs to steward ecologically responsible nanotechnology will be discussed. Opportunities for water treatment will be illustrated by considering the application of functionalized fullerenes to enhance viral inactivation in UV and solar disinfection systems, as well as in antimicrobial surface coatings, and the use of silver nanoparticles to enhance biofouling resistance in water filtration membranes.

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