ME Seminar

Infection control through surface treatments: fundamentals of adhesion and antimicrobial properties

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ABSTRACT

In this lecture, we aim to examine how surface treatments can be used for infection control and whether they can help mitigate the more challenging problem of antimicrobial resistance (AMR), where microbes develop resistance to drugs. We will begin by introducing the fundamentals of adhesion between two objects, with a particular focus on the adhesion of liquids to surfaces. This understanding will then be extended to show how surface energy can be used to control adhesion and applied to the design of surfaces that regulate bacterial attachment. Next, we will explore strategies for designing nanoengineered surfaces that exhibit microbicidal properties while controlling their toxicity to humans. Finally, we discuss will broader strategies for infection control in hospitals and buildings, as a strategy to mitigate AMR. Overall, the lecture will have a blend of advanced materials and fluid mechanics. No special background knowledge beyond UG mathematics exposure is needed.

ABOUT THE SPEAKER

Professor Tiwari is a Royal Society Wolfson Fellow and Professor of Nanoengineering in UCL Mechanical Engineering. He directs the Nanoengineered Systems Laboratory at UCL and serves on the Management Board of UCL Institute of Healthcare Engineering. His healthcare research is hosted by the UCL Hawkes Institute, and he is a member of the steering team of UCL's Manufacturing Futures Laboratory, a new centre dedicated to advanced materials and manufacturing technologies. His research has received four prestigious grants from the European Research Council (ERC). He advises two start-up companies, is on the Board of the Royal National Orthopaedic Hospital NHS Trust, Stanmore and is a member of the editorial teams of three international journals.

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