

Functional Coatings for Sterile Surfaces

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Abstract

The lecture will present bio-inspired functional coatings that are spontaneously formed by short peptides. These peptide-based coatings self-assemble on metals, oxides and polymers under mild conditions without any need for a curing step. The coating can serve in many functions. One application is preventing biofouling - the undesirable adhesion of biomolecules and organisms to surfaces. (1,2) This process leads to numerous adverse phenomenon including hospital-acquired infection, blockage of water desalination facilities and food contamination. We showed that this coating prevents the first step of biofouling, which involves the adsorption of bioorganic molecules to the substrate. Moreover, the coating significantly reduces the attachment of various organisms such as bacteria and fungi to surfaces. Another function that these peptide-based coatings can mediate is the adhesion of mammalian cells to implants. (3) This function is important for the integrating of implants into the human body. Finally, we showed that these peptides self-assemble in solution into particles that adsorb and release active compound that synergistically reduce the amount of bacteria and viruses on the surface. (4,5)

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Figures

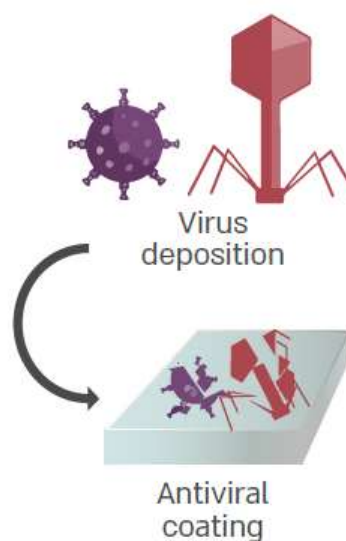


Figure 1: A peptide-based coating disrupts the supramolecular structure of both bacteriophages and corona virus and act as an antiviral coating.

References