PHOTOCATALYTIC MATERIALS FOR ANTIMICROBIAL COATINGS

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High-touch surfaces have been considered as an important source of infectious disease outbreaks. Therefore, introduction of antimicrobial coatings on surfaces at infection hot spots to prevent adhesion, proliferation, or decrease residence time of microbes, would potentially provide socioeconomic and health benefits.

Copper, along with silver, belongs to the most widespread class of antimicrobial surfaces, in the case of which the antibacterial active agent is constantly released from the coatings. One of the drawbacks of such surfaces is the overloading of such surfaces with dirt, dead skin cells, sebum, and microbial debris that could lead to decreased performance. Such overloading and inactivation could be avoided by using photocatalytic surfaces, i.e., self-cleaning surfaces, that may under specific illumination conditions, in addition to killing microbes, also photooxidize debris.

The step forward is multi-effective antimicrobial coatings (e.g. nano-ZnO and nano-ZnO/Ag composite particle-based coatings). The novelty of these coatings rises from a combined effect of different antimicrobial mechanisms: (i) antimicrobial activity of ions, and (ii) antimicrobial activity of ROS, generated via photocatalytic processes under UV-A illumination. In this presentation, we discuss the usability, preparation, properties and durability of antimicrobial multi-effective antimicrobial photocatalytic surfaces. The current presentation is based on the results of our work group in this field, see e.g. [1,2,3].

References:

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