



#PLATH00154

DEPO / Plasma - deposited coatings for optical, electronical and other functionalities

Magnetron co-sputtered TiO₂/Ag/Cu antimicrobial coatings

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Abstract content

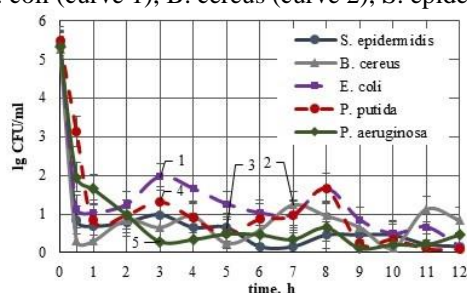
The aim of this study was to utilize the advantages of the magnetron co-sputtering as a dry technology for the fabrication of TiO₂/Ag/Cu composite coatings with controlled characteristics correlating to the antimicrobial activity of the coated medical devices. Elemental composition and distribution, surface morphology, wettability, surface energy and its component were estimated as a surface characteristics influencing the bioadhesion. Well expressed, specific, Ag/Cu concentration depending antimicrobial activity in vitro was demonstrated toward Gram-negative and Gram-positive standard test bacterial strains (both, by diffusion tests and Most Probable Number of survived cells). Direct contact and eluted silver/copper nanoparticles and ions mediated killing were experimentally demonstrated as a mechanism of the antimicrobial activity of the studied TiO₂/Ag/Cu thin composite coatings. It is expected that they would ensure broad spectrum bactericidal activity during the indwelling of the coated medical devices, maintaining their performance for at least 12 h, and suggesting that benefits of their use can be obtained over longer time.

Thanks/Acknowledgement

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References

E. coli (curve 1), *B. cereus* (curve 2), *S. epiderm*



SEM images of significantly damaged *E. coli* cells

