



Biofilm Formation on Medical Implants

Michal Bestercei*

Institute of Materials Research of SAS, Slovakia

Introduction

On biomedical implants, biofilm development occurs. In contemporary medicine, microbial infections in biomedical implants are a major hazard. Biofilm infection is still a primary cause of biomaterial implant failure. All medical equipment are susceptible to microbial pathogen colonisation. Biofilm is a sessile microbial community characterised by cells that are permanently connected to a substratum or interface to each other and immersed in a matrix of extracellular polymeric substances that they have generated. Biofilms are a complex microbial community that adheres to the exopolysaccharide matrix on the surface of medical devices. Biofilm-associated infections in medical devices are a major threat to public health and have a negative impact on the device's functionality. Stainless steel and titanium alloys are utilised to make medical implants for oral and orthopaedic surgery. The biological behaviour of the device, such as osseointegration and antibacterial activity, is largely determined by the chemical composition and shape of the device's surface. Various physical and chemical methods are being used to enhance the surface characteristics of medical implants in order to enable bio-integration and inhibit bacterial adherence.

Bacteria adhering to or in a biofilm on the implant are a possible source of infection for the surrounding tissue and antimicrobial therapies, which should limit both biofilm development and tissue colonisation. Bacteria adhering to or in a biofilm on the implant are a possible source of infection for the surrounding tissue and antimicrobial therapies, which should limit both biofilm development and tissue colonisation. Antibiotics, biocides, and ion coatings are typical chemical techniques for modifying the surface of biomedical implants. Chronic wound infection, chronic otitis media, chronic osteomyelitis, chronic rhinosinusitis, recurrent urinary tract infection, endocarditis, and cystic fibrosis-associated lung infection have all been linked to bacteria that grow together, and they're a concern since many medical equipment create ideal conditions for colonisation.

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Because of the increasing resistance of biofilm-associated organisms to antimicrobial drugs and the potential for these organisms to cause infections in patients with indwelling medical devices, biofilms are a major public health concern. The growth of biofilm on reusable medical device surfaces is a concern that can be managed. Biofilms will not be able to form if devices are cleaned and reprocessed promptly using high-level disinfection or sterilisation, as well as adequate drying. Aside from quorum sensing, a variety of additional techniques to preventing or removing biofilms have been investigated. Lactic acid bacteria, plant proteases like ficin, bacteriophages, nanotechnology, and probiotics are among them. Removal of infected indwelling devices, selection of well penetrating and sensitive antibiotics, early administration of high dosage antibiotics in combination and supplemented with anti-QS treatment and/or biofilm dispersal agents are all things we believe should be included in biofilm treatment right now.

*Corresponding author: Michal Bestercei, Institute of Materials Research of SAS, Slovakia, E-mail: michalBtercei@yahoo.com

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