

Nitric Oxide vs Bacteria: NO means NO!

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Abstract

Nitric oxide (NO) plays a significant role in many biological processes, including the body's own immune response to fighting off infections. Given the rise in multi drug resistant bacteria, conventional antibiotics are failing, which demands the development of new antimicrobial agents that are not antibiotics. NO holds substantial promise in this regard as it has shown potent antimicrobial activity against both planktonic and biofilm bacteria and has a low tendency to develop microbial resistance. NO is a short-lived, lipophilic gas that can easily diffuse across a cell membrane and combines with reactive oxygen species to cause nitrosative damage on invading pathogens. The activity of NO is dose dependent with low concentrations dispersing biofilms and high concentrations having more of a biocidal effect. Despite the potency of NO as antimicrobial agent, delivery of the gas in a controlled and sustained manner for the desired clinical application is where the challenge lies. This talk will describe a variety of delivery platforms that have been developed to provide controlled and sustained delivery for an elongated lifetime of NO release. The platforms include the hydrogels, nanoparticles, electrospun fibers and thin film coatings for treatment of dermal, ocular surface or orthopaedic infections.

Biography

Dr. D'Sa's leads the Antimicrobial Biomaterials Group at the University of Liverpool. Her research focuses on the development of nitric oxide delivery platforms for treatment of multidrug resistant infections. Her research focuses on the development of these antimicrobial platforms to be used for skin, ocular and bone tissue engineering applications. She has over £2 million in research funding with over £1.5 million as a PI. She currently sits on the Editorial Board and Topic Board for the Journal Polymers and Antibiotics. She has been the recipient of the Arthur D Chambers and Buhle Endowment Fellowships. Dr D'Sa is passionate about supporting the next generation of scientists and has supervised students from various backgrounds to deliver new solutions for infection control and tissue engineering applications. She is currently involved with the supervision of 7 PhD students, and 2 postdoctoral fellows. She engages widely with clinicians, health professionals, patients, charities, has a significant interest in communication of science to the general public through artistic media.

