A Novel Method of Coating Medical Devices Using a Saturated Short Chain Monocarboxylic Acid and Glycerol

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Technology description

Publications: 1. In vitro activity and durability of a combination of an antibiofilm and an antibiotic against vascular catheter colonization. Mansouri MD, Hull RA, Stager CE, Cadle RM, Darouiche RO. Antimicrob Agents Chemother. 2013 Jan;57(1):621-625. 2. In vitro potency and in vivo efficacy of a novel bis-indole antimicrobial compound in reducing catheter colonization. Mansouri MD, Opperman TJ, Williams JD, Stager C, Darouiche RO. Antimicrob Agents Chemother. 2012 Apr;56(4):2201-2204. 3. Efficacy of combination of chlorhexidine and protamine sulphate against device-associated pathogens. Darouiche RO, Mansouri MD, Gawande PV, Madhyastha S. J Antimicrob Chemother. 2008 Mar;61(3): 651-657.

In-dwelling medical devices, such as catheters, vascular grafts, and surgical mesh, are becoming essential to patient care. However, colonization of bacteria/fungi on the surfaces of the implant or other parts of the device can produce serious patient problems, including the need to remove and/or replace the implanted device and to vigorously treat secondary infective conditions. Various methods of coating medical devices with antimicrobial agents have been tested; however, the drawbacks include alteration of the integrity of non-metallic medical devices and residual antimicrobial material precipitating within the device. A safe, effective, and versatile medical device coating method is needed to provide a broad range of antimicrobial activity for improving patient care. Drs. Mansouri and Darouiche have developed a novel method of coating non-metallic medical devices using a saturated short chain monocarboxylic acid and glycerol. It can be used to effectively treat various types of non-metallic materials, including but not limited to polytetrafluoroethylene (PTFE), polyurethane, nylon, silicone, polyethylene, resorbable polylactide, and various biomaterials. Furthermore, the method enables dispersing combinations of antimicrobial agents along the surface of the medical device to obtain a synergistic antimicrobial effect and to provide a broad range of antimicrobial activity against harmful microorganisms, such as Staphylococcus Epidermidis, Escherichia coli, and Candida albicans, the three major organisms causing infectious complications associated with indwelling medical devices.

Advantages

Applicable to a variety of non-metallic in-dwelling medical devices, like catheters, vascular grafts, and surgical mesh. - Compatible with different polymers and biomaterials. - Enable coating surface of medical devices with a combination of potent antimicrobial agents that provides synergistic effects - Provide a broad range of antimicrobial activity

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