“Here we describe nonfouling, lubricant-infused slippery polymers as proof-of-concept medical materials that are based on oil-infused polydimethylsiloxane (iPDMS). Planar and tubular geometry silicone substrates can be infused with nontoxic silicone oil to create a stable, extremely slippery interface that exhibits exceptionally low bacterial adhesion and prevents biofilm formation” MacCallum et al (2015).

Reference:

MacCallum, N., Howell, C., Kim, P., Sun, D., Friedlander, R., Ranisau, J., Ahanotu, O., Lin, J.J., Vena, A., Hatton, B., Wong, T-S. and Aizenberg, J. (2015) Liquid-Infused Silicone As a Biofouling-Free Medical Material. ACS Biomaterials Science & Engineering. 1(1), p.43–51.

Antibacterial coating prevents biofilms from forming on device surfaces http://ctt.ec/c8aaT+ @ivteam #ivteam

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Abstract:

There is a dire need for infection prevention strategies that do not require the use of antibiotics, which exacerbate the rise of multi- and pan-drug resistant infectious organisms. An important target in this area is the bacterial attachment and subsequent biofilm formation on medical devices (e.g., catheters). Here we describe nonfouling, lubricant-infused slippery polymers as proof-of-concept medical materials that are based on oil-infused polydimethylsiloxane (iPDMS). Planar and tubular geometry silicone substrates can be infused with nontoxic silicone oil to create a stable, extremely slippery interface that exhibits exceptionally low bacterial adhesion and prevents biofilm formation. Analysis of a flow culture of Pseudomonas aeruginosa through untreated PDMS and iPDMS tubing shows at least an order of magnitude reduction of biofilm formation on iPDMS, and almost complete absence of biofilm on iPDMS after a gentle water rinse. The iPDMS materials can be applied as a coating on other polymers or prepared by simply immersing silicone tubing in silicone oil, and are compatible with traditional sterilization methods. As a demonstration, we show the preparation of silicone-coated polyurethane catheters and significant reduction of Escherichia coli and Staphylococcus epidermidis biofilm formation on the catheter surface. This work represents an important first step toward a simple and effective means of preventing bacterial adhesion on a wide range of materials used for medical devices.

Full Text

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