Licensing Opportunities

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BACTIGON®: Novel synthetic materials that minimise bacterial attachment and biofilms formation

Summary

A key challenge for the optimal performance of many devices is the prevention of bacterial colonisation. The consequence of bacterial attachment to the surface of medical devices can be infection, in food processing equipment it is product spoilage, and similar undesirable microbiological outcomes pervade many market sectors.

For example, it is estimated that 80% of hospital derived infections involve biofilms and this technology has the potential to reduce this figure and have a positive impact on patient outcomes.

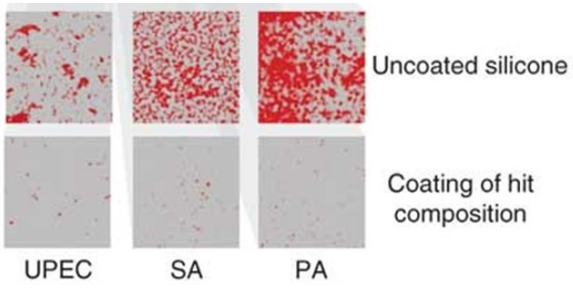
In vitro testing of a novel class of BACTIGON® polymers that were identified using a high throughput approach shows them to outperform commercially available silver-containing coatings in resisting colonisation with 4 common bacterial pathogenic strains.

In vivo testing of BACTIGON® polymers has demonstrated the potential to reduce medical device-centred infections. These are currently undergoing clinical testing.

The BACTIGON® polymer formulation has been optimised for application in a number of different applications, e.g. as a coating on various polymer medical devices to reduce colonisation, coating of metals to reduce bacterial fouling in domestic water contacting devices and coating fabrics to reduce bacterial colonisation of garments.

Technical Information

The technology is a novel class of patented materials called BACTIGON® which are acrylate and methacrylate polymers resistant to bacterial attachment discovered using a high throughput materials discovery platform with up to 81%, 99%, 99% reduction in bacterial coverage of *P. aeruginosa* (gram-), *S. aureus* (gram+), and uropathogenic *E. coli* (gram-) respectively, compared to market leading anti-bacterial silver hydrogel as well as clinically isolated strains.



Red stained biofilm for the three pathogens studied (*P. aeruginosa* (PA), *S. aureus* (SA), uropathogenic *E. coli* (UPEC) from coated and uncoated silicone catheters.

Lead formulations of BACTIGON® prevent biofilm colonisation through resistance to bacterial attachment rather than a killing mechanism (supported by the unaltered growth profile of bacteria in contact with hit materials).

Coating silicone with BACTIGON® achieved up to a 30-fold (96.7%) reduction in the surface area covered by bacteria compared with a commercial silver hydrogel coating *in vitro*.

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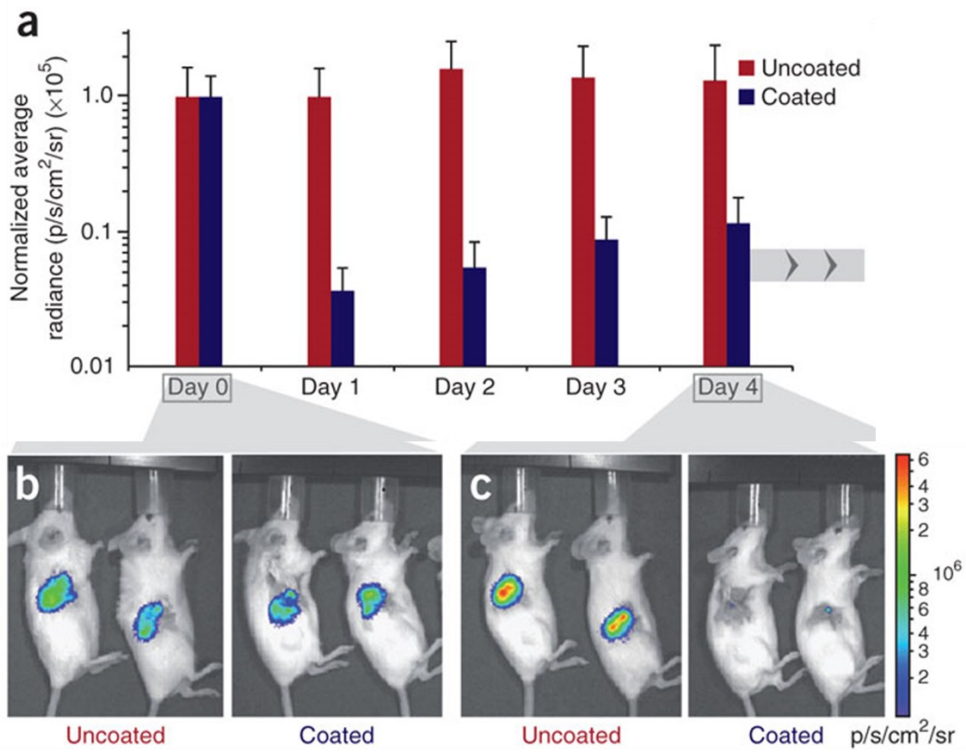

Catheters dip-coated with hit polymer were implanted subcutaneously in mice. Mice were inoculated after 1 d with S. aureus Xen29, injected into the tube lumen. (**a**) The bioluminescence at the infection site was measured on the day of inoculation (day 0) and for the next 4 days. The difference in bioluminescence between coated and uncoated samples from day 1 to 4 was confirmed to 99.5% confidence (t-test). (**b,c**) Luminescence images with overlaid brightfield images of mice implanted with both uncoated (left) and coated (right) catheter segments on day 0 (**b**) and day 4 (**c**). Adapted from ***Nature Biotechnology***. *Vol 30, No. 9, Sept 2012.*

IP Status

Granted US (9,981,068B1) and EP (2704565B1) patents (priority date: 04-05-2011). 'Polymers which resist bacterial attachment'.

Literature

1. 'Combinatorial discovery of polymers resistant to bacterial attachment'. ***Nature Biotechnology***. Vol 30, No. 9, Sept 2012.
2. Discovery of Novel Materials with Broad Resistance to Bacterial Attachment Using Combinatorial Polymer Microarrays. ***Advanced Materials.*** 2013, 25, 2542-2547.

Opportunity

Licence and commercial collaboration or investment opportunities are available for BACTIGON®.

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