Advances in Polymer Technology

Special Issue on

Advances in Synthesis, Characterization, and Application of Antimicrobial Polymers

CALL FOR PAPERS

Implant associated infections, particularly those associated with urinary catheters or contact lenses, are a pressing problem within the Healthcare Industry. With the aging world's increasing reliance on implantable biodevices, along with the rapid development of antibiotic resistance, such infections are one of the major causes of complications among hospitalized patients—leading to longer treatment duration and increased healthcare costs. Consequently, the design and development of antimicrobial polymeric surfaces is now imperative for the ongoing use and safety of such devices. Scientists have adopted diverse strategies in order to obtain the desired materials, including approaches such as designing biopassive (or antiadhesive) coatings and/or bioactive (or contact killing) surfaces. With regard to the former strategy, several polymeric materials have been designed to prevent microbial adhesion and subsequent biofilm formation. For the latter, traditional bioactive antimicrobial coating strategies rely upon releasing antibacterial agents, such as antibiotics or metal ions, which have been found to be suboptimal. To overcome this problem, scientists have recently proposed antimicrobial peptides (AMPs) to be an ideal coating agent for bioactive material surfaces. Several properties of AMPs, such as tolerance to resistance development and their broad spectrum of antimicrobial activity, have attracted scientists to use them as a solution to the healthcare problem at hand.

However, antimicrobial peptide coating strategies are often associated with several challenges related to loss of activity after immobilization. In fact, the effectiveness of the coating strategy has been found to be related to many factors, including the type of peptide used, the immobilization chemistry/process involved, the mechanism of action of the molecules before and after immobilization, and the analytical strategies adopted for characterizing and/or evaluating the coated surface. Likewise, the design of biopassive polymers is associated with challenges like achieving the optimal hydrophile-lipophile balance while retaining their biocompatibility and adherent properties in order to remain coated on the target surfaces within the physiologically relevant environment.

This Special Issue is dedicated towards addressing the above-mentioned challenges with regard to the development of antimicrobial polymeric surfaces using diverse strategies. We invite outstanding research and review articles from researchers working in related fields for this issue.

Potential topics include but are not limited to the following:

- The rational design of biopassive/bioactive materials
- Design and development of peptides for immobilization on polymers
- Immobilization chemistries as applied to the coating of polymeric surfaces
- The mechanisms of action of the antimicrobial materials before and after immobilization
- Analytical strategies for characterizing coated polymeric surfaces
- Scale-up studies with regard to antimicrobial polymeric surfaces

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/apt/spach/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

Lead Guest Editor
Anindya Basu, Rajiv Gandhi Technical University, Bhopal, India
anindya@rgtu.net

Guest Editors
Susanna Leong, Singapore Institute of Technology, Dover, Singapore
susanna.leong@singaporetech.edu.sg

Nanda G. Sahoo, Kumaun University, Nainital, India
ngsahoo@kunainital.ac.in

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