Development of Benzimidazole-modified Polymers as Antibacterial Contact-Active Coatings

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For several decades, the human society routinely used antimicrobial agents for the management of infections provoked by pathogenic microorganisms (viruses, bacteria or fungi). Although these compounds constitute an essential part of modern medicine, they have been responsible for the emergency of drug-resistant mutants, which lead to the withdrawal of some antibacterial agents from widespread use. As a consequence, treatment options for patients or contaminated surfaces appear limited because the microbial resistance evolves quicker than the drug development. In this context, there is an urgent need to identify and develop new classes of antimicrobial compounds not developing resistance. Recent researches highlighted the antibacterial potential of bisbenzimidazole derivatives (especially BBz3CN) against Gram(-) and Gram(+) bacterial strains.

The proposed study is dedicated to the development and the antibacterial evaluation of a library of structural analogues of BBz3CN by mean of subtle chemical changes, but also through the study of a multivalent approach (by the use of dendrimers, as well as block/random copolymer surfaces). In second step, the feasibility of using our systems as antibacterial contact-active coatings will be evaluated.