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Anti-adhesive properties of cobalt bis(dicarbollide) amino derivatives against gram-positive bacteria

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Biofilms are communities of microorganisms irreversibly adhered to a surface or to each other, which are embedded in an extracellular polymeric matrix. They cause wide range of serious human infections and contaminate medical instruments. The huge difference between the behaviour of sessile cells in biofilm and planktonic cells in suspension is their high resistance against typically used antibiotic. The solution of this problem might be in the treatment of biofilm-associated infections with unusual compounds. Examples of such agents are boranes and their derivatives; 3D cluster inorganic compounds consist of boron, hydrogen, carbon or other elements. Our group of samples include cobalt bis(dicarbollide) anion and its amino derivatives with potentially pharmacologically usable properties. This study was focused on the monitoring of antimicrobial activity of cobalt bis(dicarbollide) anion and two cobalt bis-1,2-dicarbollide amino derivatives on a number of selected opportunistic pathogenic microorganisms involving representatives of yeast, gram-negative bacteria and gram-positive bacteria. The second aim was to investigate the anti-adhesive properties of these substances against gram-positive bacteria *Staphylococcus epidermidis*. The antimicrobial activity was investigated in Biocreen C and the influence of cobalt bis-1,2-dicarbollide amino derivatives on *S. epidermidis* microbial adhesion inhibition was determined by crystal violet assay and XTT method (evaluation of metabolic activity). We have proved that selected cobalt bis-1,2-dicarbollide amino derivatives have significant antimicrobial activity and selectivity against gram-positive bacteria and we also demonstrated their anti-adhesive properties against *S. epidermidis*.

Biography

Kvasnicková E is a PhD student at the University of Chemical Technology, Prague, Faculty of Food and Biochemical Technology, Department of Biotechnology. She is an author or co-author of 1 paper in peer-reviewed international journal (impact 0.604), and 6 papers in conference proceedings.

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