

Abstract Submitted
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Development of novel antibiofouling materials from natural phenol compounds RAHUL CHELIKANI, DONG SHIK KIM, The University of Toledo — Biofilms consist of a gelatinous matrix formed on a solid surface by microbial organisms. Biofilm is caused due to the adhesion of microbes to solid surfaces with production of extracellular polymers and the process of the biofilm formation is referred to as biofouling. Biofouling causes serious problems in chemical, medical and pharmaceutical industries. Although there have been some antibiofouling materials developed over the years, no plausible results have been found yet. Natural polyphenolic compounds like flavanoids, catechins have strong antioxidant and antimicrobial properties. Recently, apocynin, a phenol derivative, was polymerized to form oligomers, which can regulate intracellular pathways in cancer cells preventing cell proliferation and migration. These natural phenolic compounds have never been applied to solid surfaces to prevent biofouling. It is thought that probably because of the difficulty to crosslink them to form a stable coating. In this study, some novel polyphenolic compounds synthesized using enzymatic technique from cashew nut shell liquid, a cheap and renewable byproduct of the cashew industry are used as coating materials to prevent biofouling. The interaction of these materials with microbes preventing fouling on surfaces and the chemico-physical properties of the materials causing the antibiofouling effect will be discussed. It is critical to understand the antibiofouling mechanism of these materials for better design and application in various fields.

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