

Synthesis of New Biocompatible Materials Based on Alginic Acid with Antibacterial Activity

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To replicate the exceptional performance of natural processes at a reasonable cost, scientists have often looked to nature for inspiration when creating high-performing, low-cost bio-based materials. Regarding those above, we decided to focus our recent research on alginic acid, a polymer extensively found in brown algae's cell walls. To achieve our aim, we chose the functionalization of alginic acid with Kojic acid, a chelating agent produced by different species of fungi. Due to Kojic acid's ability to chelate, the material has exhibited siderophore action and antibacterial activity against Gram-positive and Gram-negative bacteria without any cytotoxic effect. In addition, alginic acid was also functionalized with an ionic liquid. The latter already had recognized antibacterial properties that were enhanced by the functionalization. This new material was further modified with another interesting chelator, tris(3-hydroxypyridin-4-one) (THP). Antibacterial tests performed on this material have also shown excellent antibacterial activity.