ANTIMICROBIAL COMPOSITE WOUND DRESSING

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Nowadays, a wound dressing is no longer a passive material, it must interact with the wound and improve the healing process. In fact, the actual requirements for a wound dressing are quite challenging. To achieve these demanding goal, wound dressing' research have been focus on the development of composites that combine the best of two or more polymeric materials. Thus, our group developed a composite material of cotton functionalized with hydroxypropyl methylcellulose / cyclodextrins hydrogel to be used as antimicrobial wound dressing. Hydrogel polymer will improve the wearability and the drug delivery capacity of cotton textiles. And cotton will enhance the mechanical properties of hydrogel, facilitating the handle process.

The composite synthesis was performed by one-step chemical crosslinking. The reaction parameters, such as crosslinker concentration and polymeric solution concentration, were optimized. The obtained composites were characterized base on their physicochemical and biological properties.

To the best of our knowledge, loading and release of gallic acid (as antibacterial agent) into composites wound dressings, and its release for control wound infections, have not been evaluated until now. The developed composites have the combined properties of cotton and hydrogel. The gallic acid was successfully loaded into the polymeric network, and it release was sustained for 48 h. The loaded composites can destroy bacterial cells preserving the gallic acid antibacterial activity. Thus, the developed composites showed suitable properties for the incorporation of gallic acid and utilization as antibacterial wound dressing.

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