

BIOPOLYMER/NANOCOMPOSITE MATERIALS IN MEDICINE

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A large number of recent studies deal with the application of biopolymer nanomaterials to different medicinal applications that led to a new discipline known as nanomedicine. It comprises the processes of diagnosing, treating, curing, preventing diseases and also dealing with traumatic injury, relieving pain and preserving/improving human health by using nanoscale materials. Among nanoscale materials, an

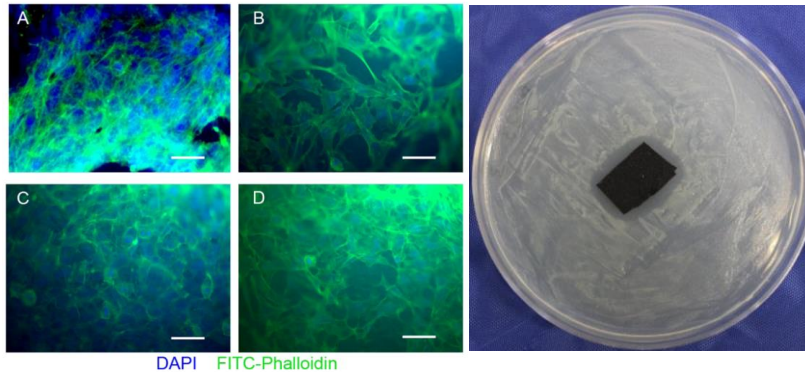


Figure 1 – A starch-based biopolymer composite rendered antimicrobial by functionalizing with another biopolymer. This smart biopolymer composite has no toxicity towards cell growth but is very effective against E-coli.

important place belongs to the group of natural and synthetic polymer nanocomposites. These are made up of an organic polymer matrix and mineral, organic or metallic nanofiller. The properties of polymer nanocomposites depend on the characteristics of the components and on the interaction polymer nanofiller. Polymer nanocomposites offer to modern medicine new opportunities for generate products. Hence, this talk will present recent advances in biomedical applications of nanostructured biopolymer nanocomposites including antibacterial treatments, tissue

engineering, cancer treatment and drug delivery.

The multifunctional characteristics of polymer nanocomposites make them highly suitable for a wide range of applications in medicine. Some polymer nanocomposites can selectively deliver therapeutic and diagnosing agents specifically to a diseased site, some other are attractive for regenerative medicine applications (bones, nerves, vascular, muscles, etc.), diagnosing equipment, and so forth. The application of polymer nanocomposites in medicine can contribute beside other products, to saving lives and improving the life of a high number of people suffering from diseases. Progress in nanomedicine will undoubtedly require the close cooperation of multidisciplinary teams composed of biologists, bioengineers, physicians.