

Advances and applications of biofiber polymer composites in regenerative medicine

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13.1 Introduction

Nanobiotechnology is the emerging science of two powerful technologies biotechnology and nanotechnology, and it reflects science's growing ability to investigate beyond the molecular level in regenerative medicine (Venugopal, Molamma, Shayanti, Rajeswari, & Ramakrishna, 2012). In nanobiotechnology, nanoscale biofibers are used to develop highly functional biosensors, nanosized microchips, molecular switches and tissue analogous for skin, bones, cardiac muscles, nerves, vascular and other organs of the body. Nanobiotechnology plays a central role in the recent technological advances in the areas of disease diagnosis, drug design, and drug delivery. The nanobiotechnological applications for the treatment of disease, diagnosis, monitoring, and to the control of biological systems have been referred to as "nanomedicine." Several areas of nanomedicine are expected to revolutionize the disease diagnosis and treatment approaches soon to save patient life. Nanorobotics and nanomanipulation technologies will eventually allow moving and manipulating nanoscale materials and assemble them into nanosystems such as nanoscale robotics. Recently, tissue engineering mainly focused for the development of biomaterial that is novel which mimic the extracellular matrix (ECM) in a better way. Biomaterial used in tissue engineering of joining the natural capability of cells to wisdom their native environmental surrounding by cell to cell interaction, cell infiltration and congregate by self in to compound complexes to illuminate the regenerative behavior (Huebsch et al., 2010). Scope of tissue engineering is under