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Hydrogels

Antimicrobial Characteristics, Tissue Engineering, Drug Delivery Vehicle

With the advancement in medicinal chemistry and material science, several highly specific, biocompatible and non-toxic therapeutic agents have been discovered and successfully applied for various clinical applications. Many of the conventional constraints of clinical therapies have been replaced and overcome by the multifaceted applications of material science and nanotechnology. Recently, material science-based therapeutic agents are the major global pharmaceutical market and are believed to mount exponentially shortly. Among the various therapeutic agents, hydrogels are one of the most widely applied materials used in the treatment of various diseases, and one of the most diverse materials that are used for multipurpose applications. Hydrogels were the first biomaterials used for Human being. Hydrogels are polymeric linkages, water-insoluble, however, sometimes established as a colloidal gel in water. Hydrogels are the superabsorbent materials because it can absorb more than 90% water, and hence regarded as natural living tissue. Mechanically strong hydrogels were synthesized by the advent of new synthetic strategies. Owing to the swollen properties, three-dimensional polymer network, and strong mechanical characteristics, these are widely used in catalysis, adsorption, drug delivery systems for proteins, contact lenses, wound dressings, wound healing, bone regeneration, tissue engineering, baby diapers, food rheology, and many others. Due to their diverse applications, hydrogels are considered one of the smartest materials in pharmaceutics, and are eco-friendly materials, cheap, and have good recyclability. They are used as therapeutic agents in different health sectors. As they are very sensitive to target, therefore it is considered favorite and preferred choice in biomedical sectors. Patients are psychologically scared of surgeries regarding huge expenses and failure. So researchers are working on hydrogels as alternative surgical replacement. In most cases, they have successfully achieved research on hydrogels in bones and tissues repairment. It might be hope of life for serious patients in future. The domain of this work will cover state of the art potentials and applications in various technological areas.

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