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Advanced Biopolymers for Tissue Engineering Application

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Message from the Guest Editor

Tissue engineering can solve many problems of regenerative medicine, with the capacity to improve the duration and quality of human life by restoring the lost structure and function of organs and tissues. The main task of tissue engineering and regenerative medicine is to develop an optimal biodegradable polymer scaffold (matrix), ensuring cell adhesion and proliferation. This must be gradually replaced by forming tissues or organs. Biodegradable polymers are used as biomaterials to create scaffolds, and the choice of polymer is determined by its biomechanical compatibility with the resorbed tissue. Materials used in soft tissue replacement surgery should have a high water-retaining capacity. Therefore, from the point of view of biomimetics, the use of polysaccharide hydrogels is preferable over hydrophobic biodegradable polyesters. Conversely, due to their mechanical strength and osteoconductive properties, composite materials based on polyhydroxyalkanoates and inorganic phosphates are considered promising for bone replacement.

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