Special Issue

Biomaterials for Tissue Regeneration: Current Progress and Future Directions

Message from the Guest Editors

A wide range of biomaterials and, more recently, 3D bioprinting have been implemented and become crucial elements for successful reconstructions, serving as scaffolds for tissue regeneration or as implants to restore structural integrity. Tissue engineering approaches involving stem cells, growth factors, and bioactive scaffolds hold promise for enhancing tissue regeneration and improving long-term outcomes. These constructs elicit a complex biological response upon implantation. Various tangled signaling mechanisms orchestrate cellular activities, essential for tissue repair and regeneration. Different types of cells interact with biomaterials to influence the healing process. Surface properties, such as topography and chemistry, modulate cell adhesion, proliferation, and differentiation. Understanding these molecular mechanisms enables tailoring specific regenerative applications in the reconstruction of complex tissue defects. In this Special Issue, we invite contributions that shed light on the molecular mechanisms involved in the successful reconstruction of soft and hard tissue defects.

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