

Special Issue

Bio-Based Materials and Personalized Medicine: Innovative Applications in Tissue Engineering and Drug Delivery

Message from the Guest Editors

The intersection of bio-based materials and personalized medicine represents a rapidly evolving field in biomedical science. As the demand for more effective, patient-centered treatments has increased, the development of sustainable and biocompatible materials has become essential for advancing tissue engineering and drug delivery technologies. Bio-based materials—derived from renewable natural resources such as polysaccharides, proteins, lipids, and biodegradable polymers—exhibit inherent biocompatibility, tunable properties, and environmental sustainability, making them ideal candidates for next-generation medical applications.

In the context of tissue engineering, these materials provide structural and biochemical signals that mimic the native extracellular matrix, supporting cell adhesion, proliferation, and differentiation. This enables the fabrication of customized scaffolds and implants tailored to patients' unique needs. Meanwhile, in drug delivery, bio-based carriers are engineered to enable the controlled, targeted, and stimuli-responsive delivery of therapeutics, enhancing treatment efficacy while minimizing side effects.

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