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Special Issue Reprint

## Advanced Cellulose-Based Materials

**Edited by: Selestina Gorgieva**

This Reprint presents a curated collection of recent advances in cellulose and nanocellulose research, reflecting the growing importance of this abundant, renewable polymer as a high-performance engineering material. Built from glucopyranose units linked by  $\beta$ -1,4-glycosidic bonds, cellulose exhibits structural versatility across various sources and processing routes. Its nanoforms, including nanocrystals and nanofibrils, can be obtained both through top-down disintegration of plant-based materials and through bottom-up biosynthetic approaches such as microbial fermentation, each yielding materials with distinct and tunable properties.

The contributions gathered in this Reprint highlight the advancements in isolation techniques, bioprocessing strategies, and advanced material design, including selective modification, hybridization, and the structuring of cellulose-based systems. Emphasis is placed on enabling next-generation applications where performance, sustainability, and functionality converge. By integrating experimental and theoretical insights, this Reprint provides a forward-looking perspective on how cellulose can be engineered to meet increasingly demanding technological challenges and serve as a viable alternative to conventional synthetic materials.

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