

Special Issue Reprint

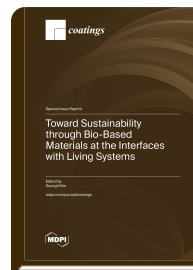
Toward Sustainability through Bio-Based Materials at the Interfaces with Living Systems

www.mdpi.com/books/reprint/8207

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ISBN 978-3-0365-9338-8 (Hardback)

ISBN 978-3-0365-9339-5 (PDF)



Over the centuries, technological advancements have significantly enhanced various aspects of human life by improving the performance of materials that interact with living systems. Nevertheless, the mass production and disposal of numerous newly developed materials have given rise to a pressing 21st-century challenge: environmental sustainability. For instance, during the COVID-19 pandemic, the World Health Organization estimated that 89 million facial masks were required monthly for frontline health workers. A promising solution to this challenge lies in the micro- and nanofabrication of bio-based materials, which can transform current technology that is reliant on traditional materials by providing recyclable, biodegradable, and energy-efficient alternatives. Bio-based materials, such as papers and silk textiles, have demonstrated their sustainability over thousands of years. Recent progress in science and engineering has unveiled innovative functionalities and applications of these conventional materials through processes such as regeneration, recombination, and structural modification. This Special Issue is dedicated to exploring the future potential of bio-based materials in various applications interfacing with living systems, such as the human body, plants, soil microbiomes, and food.

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