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Naturally Derived Biomaterials: Advances and Opportunities
(2023) *Engineering Materials*, 2023, pp. 3-41.

DOI: 10.1007/978-981-99-6698-1_1

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Abstract
Biomaterials are materials that have been formed from or created by biological organisms such as plants, animals, bacteria, fungus, and other forms of life are referred to as biologically derived materials. Biomaterials are normally designed to interface with biological systems, for the treatment, augmentation, or replace-ment of biological functions. Across billions of years, life has been composed of and existed within these biomaterial molecules, monomers, and polymers. For instance, biomaterials of polysaccharides are sugars or starch polymers. Cellulose is the most ubiquitous and abundant polysaccharide. Polysaccharides are found in the tissues of both trees and humans. Meanwhile, natural biomaterials are substances that are derived from natural sources such as plants, animals, or minerals, and are used in medical and healthcare applications. Examples of natural biomaterials include collagen, chitosan, silk, cellulose, hyaluronic acid, and bone minerals such as hydrox-yapatite. These materials are attractive in the field of regenerative medicine and tissue engineering due to their biocompatibility and biodegradability. Additionally, some natural biomaterials can mimic the physical and chemical properties of the body's natural tissues, making them ideal for use in implants and scaffolds. Recent advances in the production of natural biomaterials include the development of more efficient and scalable manufacturing processes, which has made them more widely available and accessible for use in medical applications. In addition, advances in the understanding of the biological interactions between these materials and the body have allowed for the development of new and improved medical devices and therapies. The use of natural biomaterials also provides unique opportunities for customization and personalization in medical treatment. For example, natural biomaterials such as collagen and hyaluronic acid can be engineered to meet specific patient needs, such as tissue repair and regeneration, wound healing, and drug delivery. Overall, natural biomaterials have shown great promise in many fields. This chapter's goal is to give readers a quick introduction to naturally derived biomaterials and their advances and opportunities. For example, recent developments in the production of natural biomaterials have made them more widely available and accessible for usein medical applications, and advances in the understanding of the biological interactions between these materials and the body have allowed for the development of new and improved medical devices and therapies. In the coming years, the adoption of new advanced experimental methodologies, such as bioengineering approaches, will alter the practice of medicine in the applications using natural derived biomaterials. Tissue engineering, a multidisciplinary field of research involving the principles of materials science, engineering, biological sciences, and medical research, is a clear illustration of this.

Author Keywords
Biocompatibility; Biomaterials; Natural biomaterials; Regenerative medicine; Tissue engineering

Index Keywords
Animals, Biodegradability, Cellulose, Collagen, Drug delivery, Histology, Hyaluronic acid, Medical applications, Organic acids, Regenerative Medicine, Scaffolds (biology), Tissue, Tissue regeneration; Biological functions, Biological interactions, Biological organisms, Derived materials, Medical Devices, Medical therapy, Natural biomaterials, Regenerative medicine, Starch polymers, Tissues engineerings; Biocompatibility;
Animals, Biodegradability, Cellulose, Collagen, Histology, Hyaluronic Acid

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ISSN 1742-7061

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Publisher: Springer Science and Business Media Deutschland GmbH

ISSN: 16121317
Language of Original Document: English
Abbreviated Source Title: Eng. Mater.
2-s2.0-85180917518
Document Type: Book Chapter
Publication Stage: Final
Source: Scopus