ISSN: 2593-9947
Journal of Clinical and Medical Sciences

Opinion Article

Production of Eco-Friendly Nanocellulose and other Biomaterials for Future Biomedicine

Michael Varghese*

Department of medicine, Central China Normal University, Wuhan, China

DESCRIPTION

The development of cellulose nanoparticles as a promising, more environmentally friendly biomaterial that can be obtained from local plant sources is taking place now. These materials have sparked a lot of interest in biomedical applications due to their remarkable physio-chemical and biological characteristics. This study offers a thorough analysis of Nano cellulose with a focus on environmentally friendly manufacturing, consumer demand, biological features, and novel biomedical applications such tissue implants, drug delivery systems, wound healing, and biosensor applications. The current status of commercial Nano cellulose-based goods around the world and their potential for biomedical uses in the future are also covered.

In the realm of biomedicine, where a range of synthetic materials are currently used, biomedical devices and implants make up a sizable portion. But because these substances have so many negative side effects, Researchers are concentrating their efforts on creating more sophisticated, non-toxic nanomaterials. At the moment, producers and researchers are focusing on renewable resources. Because they come from naturally occurring sources and degrade through biodegradation at the end of their useful lives, cellulosic nanomaterials can almost entirely satisfy the requirements for being "green". Generally speaking, "green" products, methods, and materials are those that are less harmful to human health and the environment than conventional counterparts. Nano Cellulose (NC) is a versatile, good biocompatible substance that has attracted a lot of attention. Because of the exceptional characteristics of NC, it is strongly supported by researchers who are interested in cutting-edge green technologies for numerous biomedical applications.

They are the ideal nanomaterials for long-term practical application because the composite materials based on NC have good chemical, biological, physical, and environmental properties. Waste paper and various agricultural by-products can both be used to make NC. Since waste paper has also undergone several chemical treatments, it uses fewer chemicals in the purification stage than lignocellulosic raw materials do. It is the most economical and environmentally beneficial technique because it also aids in trash management. The advantage of employing biomaterials over alternatives is that they allow for a slow material breakdown followed by tissue regrowth. These NC-developed biomaterials are employed in artificial skin, blood vessel growth, breast prosthesis, urethral catheters, adhesion, a tissue engineering scaffolds, repair of the articular cartilage, barriers, drug release mechanisms, regeneration of the dura-meter and gum, as well as diagnostic and testing procedures.

Every day, new NC-based materials are being developed and made public for use in a wide range of biomedical applications. A new discipline called tissue engineering has the ability to create novel NC biomaterials for the creation of biomedical substitutes. Knowledge of the importance of 2D and 3D culture systems in cell activity has been improved as a result of recent study. A more physiological environment for controlling cell behavior and improving its activities is provided by 3D cell culturing. Therefore, tremendous efforts have already been reported about the development of 3D bio fabrication biomaterial systems building complex functional 3D structures with appropriate cell types in order to duplicate the biological and micro-environment components. For the early diagnosis of diseases, biomedical instruments like biosensors are also essential.

In recent years, many biosensors based on NC have been created for various tissue engineering and regenerative medicine applications. Real-time biological signals such as proteins responding to injured tissue, myocardial infarction, inflammatory responses, antibody production, and muscular dystrophy can all be monitored. Nano cellulose's high modulus makes it a viable Nano reinforcement for biomedical devices with homogenous dispersion and strong interfacial adhesion, allowing for appropriate stress transfer from the matrix to the reinforced materials. For the implementation of NC-based commercial products, it is also essential to explore the concerns pertaining to the practical challenges for designing and

Correspondence to: Michael Varghese, Department of medicine, Central China Normal University, Wuhan, China, e-mail: Michaelvarghese34@gmail.com

Received: 02-Jan -2023, Manuscript No. JCMS-23- 19815; **Editor assigned:** 05-Jan-2023, Pre QC No. JCMS-23- 19815 (PQ); **Reviewed:** 18-Jan-2023, QC No JCMS-23- 19815; **Revised:** 24-Jan-2022, Manuscript No. JCMS-23- 19815 (R); **Published:** 02-Feb-2023, DOI: 10.35248/2593-9947.23.7.206.

Citation: Varghese M (2023) Production of Eco-Friendly Nanocellulose and other Biomaterials for Future Biomedicine. J Clin Med. 7:206

producing biomedical devices based on NC. In light of these factors, the present review explored NC-based biomaterials with a focus on their cleaner manufacture, characteristics, commercial potential, difficulties, and variety of biological uses.