Production and application of nanocellulose based nano-biomaterial derived from plant cellulose as tissue engineering tools

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Abstract

The nanocellulose based nanobiomaterials like nano-biofilm and nanocoating are appropriate to medical, biomedical, cosmetics, and bioengineering industry. Biomaterial derived from plant source like biopolymers is naturally organic and biodegradable. Potential applications of nanocellulose as nano-biomaterials in the field of biosensor, wound healing, bone-cartilage regeneration, dental application such as nanocellulose has a great potential as a biomaterial for dental and oral applications. It has been used in dental pulp tissue regeneration, periodontal regeneration, and dressing of surgical wounds of the oral mucosa. In addition, nanocellulose has been explored in dental root canal treatment to remove the total residue and dry the canal and different human diseases. In addition, nanocellulose is promising to use in nanobiofilm and nanocoating for medicine (capsules and drugs), scaffolds for engineering of blood vessels, neural tissue, liver, adipose tissue, repairing connective tissue, congenital heart defects, nanobiomedicine, constructing contact lenses and protective barriers because of naturally organic and biodegradable. This study was carried out to investigate nanocellulose based nanobiomaterials and nanobiopolymers from ligno-cellulose derived plant biomass coming after bioprocess technology. From the results, it was observed that nanocullulose organic based nano-biomaterials were better than synthetic based materials for wound healing, bone-cartilage regeneration and dental application depending upon its different properties identified by ASTM (Americal standard for testing and materials) standard. Therefore, it can be concluded that organic (nanocellulose) based biodegradable nano-biomaterials may be used as biomedical and medical components in the field of tissue engineering as biomedical and medical components and application in the pharmaceutical industry.

Biography

ABM Sharif Hossain obtained his PhD in Plant and Industrial Biotechnology in 2006, Ehime University, Japan. He had a total of 215 publications including patents, Journal papers, 18 books, book chapters. He has more than 55 articles are web of sciences (ISI), He has a total of 54 Conference abstract and proceeding. He achieved h-index: 24 and total Google scholar citation: 2448. He stood first scientist at Hail University and achieved Vice Chancellor award at Hail University, KSA. He supervised PhD: 6 (UM, UKM, Malaysia), MSc: 12, Undergraduate : 32 (university of Malaya, Kuala Lumpur and Hail University, KSA) students. He has completed 19 research projects. He is an Editorial member of 10 Journals. In addition, he is an External Examiner for PhD and MSc Thesis of 5 Universities.

Citation: ABM Sharif Hossain, Production and application of nanocellulose based nano-biomaterial derived from plant cellulose as tissue engineering tools, Stem Cell Congress 2021, 15th World Congress on Tissue Engineering, Regenerative Medicine and Stem Cell Research | November 18-19, 2021,07