TOPIC OF THE PROJECT: NATURAL POLYMER GELATIN IN BIOMEDICAL APPLICATION

Polymeric materials have found notable applications in the field of attracted considerable interest in areas, such as: automobile, construction, electronics, packaging and aviation industries. Another important area where polymers have been widely used is in biomedical. This is due to their useful properties, such as: easy processing, lightweight and flexibility, high strength to weight, availability and recyclability. This generation of materials is used due to their mechanical properties (high strength, toughness, and ductility) Here we discuss, some polymers, including chitosan, alginate, starch, collagen and gelatin together with their ability to be used in the fabrication of tissue engineering matrices and drug delivery systems. Polymers are used in drug delivery devices for drug encapsulation and release. Natural polymers often have advantages such as biocompatibility, biodegradability and biologically recognizable moieties which support cellular activities.

Gelatin is a denatured collagen, generally obtained by the controlled hydrolysis of collagen extracted from animal tissues, such as skin and bovine and porcine bone. The resultant product is a mixture of polypeptides dispersed according to size and chemical reactivity, with its properties being dependent on both the collagen from which the gelatin is extracted and the method of conversion, including acid, base and enzymatic isolation. Recently, production of hydroxylated human gelatin via a microbial expression system has been reported. The methodology promises to address several significant drawbacks of animal- source gelatin, including product inconsistency, the presence of agents that are potentially infectious to humans, such as bovine spongiform encephalopathy, and immune hypersensitivity in humans.

PRINCIPAL
Dhruba Chand Halder College
P.O.- D. Barasat, P.S.- Jaynagar
South 24 Parganas, Pin- 743372

Importantly, the aforementioned technique will facilitate the production of gelatin of desirable molecular size and charge.

Gelatin is broadly applied in the pharmaceuticals industry for drug delivery, with many orally delivered capsules being based on gelatin. Recently, gelatin, natural polymers have been studied *in vivo* and *in vitro* for their potential in pulmonary drug delivery and sustained release. The mannosylated gelatin nanoparticles have been demonstrated as suitable carriers for the selective delivery of an antitubercular drug, isoniazid, to the alveolar macrophages. The organ distribution studies using these nanoparticles demonstrated adequate efficiency for spatial delivery of the drug to alveolar tissues through intravenous administration. Control release of bioactive molecules, formulations with conductive properties or systems with improved mechanical properties can be obtained using gelatin composites.

Subodh Kumar Sahoo.
24.09.22