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Polymeric Hydrogels as Smart Biomaterials

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Sterculia Gum-Based Hydrogels for Drug Delivery Applications

Amit Kumar Nayak and Dilipkumar Pal

Abstract Sterculia gum is one of the medicinally important plant-derived water soluble polysaccharides obtained from the exudate of the tree, *Sterculia urens* (Family: sterculiaceae). It is recognized as a promising biodegradable material in the development of various biomedical applications including drug delivery applications, wound dressing applications, etc. Sterculia gum is also employed as excipient in the designing of various pharmaceutical applications. In recent years, several attempts for the modification of sterculia gum have been undertaken to develop sterculia gum-based hydrogels for controlling the rate of hydration and swelling, and also tailoring the release profile of various types of drugs. In the development of these sterculia gum-based hydrogels, modifications of sterculia gum through polymer blending, cross-linking, interpenetrated polymer network (IPN) formation, polymer grafting, etc., were investigated for improved drug delivery applications. Most of these already reported sterculia gum-based hydrogels were found effective for gastroretentive deliveries as wound dressings for sustained release of various drugs. The current chapter deals with a comprehensive and useful discussion on already investigated sterculia gum-based hydrogels for the use in drug delivery applications, where the first portion of the chapter contains source, composition, and properties of sterculia gum and the latter portion contains discussion on the formulations of various sterculia gum-based hydrogel systems used for various types of drug delivery applications.

Keywords Sterculia gum · Hydrogels · Cross-linking · Polymer blending · Drug delivery

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