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## Nanocellulose: Characterisation and applications in dosage form development

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Microcellulose, predominantly, is a chain of glucose residue and one of the renewable natural polymers in expanding the field of sustainable materials easily obtained from nature. In recent times, nanocelluloses is one of the rapidly evolving fields focused mainly on polymer and particle engineering and science. The particle engineering applications offer merits in terms of

excellent physical properties, such as acceptable specific strength, low density, high toughness, and good thermal properties. Additionally, some of the biological properties such as biocompatibility, biodegradability and low cytotoxicity, are a salient feature of nanocelluloses. The nano size dimensions of the structural elements in cellulose backbone result in a high surface area and hence, will result in powerful interaction of these celluloses with surrounding species, such as water, organic and polymeric compounds, nanoparticles and living cells. This review encompasses isolation techniques and method of manufacture of nanocelluloses

from various lignocellulose natural wastes. This work is emphasizing widespread applications of particle engineered nanocelluloses in pharmaceutical, packaging, tissue engineering, cosmetic and medical devices. Various characterization techniques pertinent to nanocelluloses are also discussed. Particle engineering application of co-processed nano-cellulose with water-soluble and insoluble ingredients such as lactose and dicalcium phosphate could offer significant benefits in terms of flowability and compressibility, and could potentially render stabilization of nanocomposites.

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