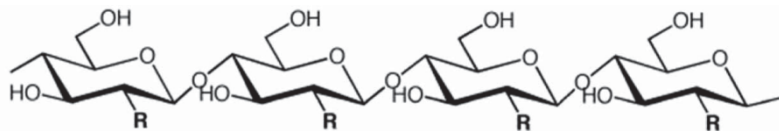


Fig. 1 Typical sources of cellulose (plant fibers) and chitin (crustacean shell) nanofibers



Cellulose: R = OH  
Chitin: R = NHC(=O)CH<sub>3</sub>

Fig. 2 Structural formula of cellulose or chitin. The only difference is the functional group R

### Content:

Cellulose is the most abundant biopolymer on earth, being a sustainable resource, biodegradable, and photosynthesized by fixing CO<sub>2</sub> from the atmosphere. They are mostly present in the cell wall of plants in the form of nanofibers. These elements have mechanical properties similar to aramid fibers and have the potential to reinforce plastics. However, the extraction requires specialized equipment, is energy consuming and costly, and the yield is low. To reduce the extraction cost, we are developing alternative methods with lower energy input and using affordable apparatuses like household blenders and ultrasonication devices. As the mechanical process of nanofibrillation relies on the application of impact and shear forces to the original plant fibers, in principle any mechanism to appropriately apply such forces has the potential to be a means to extract cellulose nanofibers affordably.

Chitin is another biopolymer present as nanofibers mainly in the exoskeleton of crustaceans, and can be extracted by the same method as cellulose nanofibers. Chitin nanofibers can also be used as reinforcement.

Keywords : cellulose, chitin, nanofiber, blender, ultrasonication

E-mail: [nakagaito@tokushima-u.ac.jp](mailto:nakagaito@tokushima-u.ac.jp)

Tel. +81-88-656-7364

Fax: +81-88-656-9082

HP: <http://pub2.db.tokushima-u.ac.jp/ERD/person/227457/profile-en.htm>

