

Press release

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Bionanocomposite gelatin films for functional food packaging

On December 11, 2020, Liliane Samara Ferreira Leite defended a doctoral thesis prepared at the University of Grenoble Alpes in joint supervision with the Federal University of São Carlos (Brazil), under the supervision of Julien Bras, Senior Lecturer HDR (Grenoble INP- Pagora / LGP2), and Luiz Henrique Capparelli Mattoso, Senior Researcher (Embrapa / UFSCar).

Liliane Samara Ferreira Leite presented the results of her research entitled *Preparation and characterization of bionanocomposites based on protein and cellulose nanocrystals by continuous casting*. This Ph.D. thesis covers the production and characterization of gelatin/cellulose nanocrystals (CNC) films intended for functional food packaging.

The up-scalability of the gelatin/CNC films was attained by continuous casting. The continuous casting processing was proven to be advantageous when compared to the bench solution casting method. Tensile tests, thermogravimetric analysis and water vapor permeability analysis showed that the continuously cast gelatin/CNC films had exceptionally better performance than the films obtained by bench casting.

The suitability of CNC was successfully extended by functionalization of CNC with natural molecule like rosin and tannic acid to obtain successfully anti-microbial and anti-oxidant properties.

This thesis provides a comprehensive understanding of how nanocellulose can be explored to develop biodegradable films based on gelatin with enhanced properties or extra functionalities. A continuous solution casting was applied for scaling up the production of gelatin/CNC-based films making them highly desirable for packaging applications.

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