Young speaker (10+2 min):

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Fabrication of Drop-Casted and Electrospun Chitosan/Hydroxyethyl Cellulose Membranes with Encapsulation of Probiotics for Biomedical Applications

Abstract: The development of biocompatible and efficient delivery systems for probiotics is gaining increasing attention in biomedical research. In this study, we report the fabrication of membranes based on chitosan (CS) and hydroxyethyl cellulose (HEC) as potential carriers for probiotic encapsulation.
In this design, the CS network provides physical support, while the swelling properties of HEC contribute to the probiotic entrapment, creating a green platform that exploits the probiotic action of non-pathogenic bacteria to fight microbial infections. In this study, the entrapment efficiency was assessed with drop-casted films and electrospun membranes of CS and HEC, obtaining new sustainable polymeric films. The so-obtained materials have been characterized by performing spectrophotometric analysis, thermal tests, and morphological investigations. The latter approach was the entrapment of viable bacteria, testing two non-pathogenic strains. *Bacillus velezensis* MT9 has been investigated as a potential probiotic, being metabolically and genomically characterized and in vivo tested, showing the modulation of the intestinal microbiota of the Nile tilapia (*Oreochromis niloticus*). *Lactobacillus rhamnosus* is a model probiotic bacterium often used in probiotic delivery tests.
The non-cytotoxic biological response, combined with the probiotic action, could help promote the use of electrospun-based dressing as one-health engineering solution for biological and medical applications, from biopesticides and feed additives to wound healing.