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Fabrication of active food packaging materials from natural polymers via electrospinning

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Plastic packing of food products has led to immense waste of non-biodegradable products, which negatively impacts the environment. By using natural polymers through electrospinning fabrication, the development of biodegradable food packaging can be produced with superior properties. Recently, starch has been substituted through electrohydrodynamic process with the potential to fabricate biodegradable and functional films. To achieve this objectives, the technology of coaxial electrospinning using a electrohydrodynamic process can produces a consistent outer shell and inner core structures from two purposefully prepared solutions via a coaxial emitter. The produced fibers have encapsulated with bioactive compounds that reduce contamination from microbiome. In my research, we will focus on developing potato starch and water-soluble yellow mustard (WSM) mucilage fibers which are embedded with the bioactive compounds tymol and carvacrol as an alternative to standard non-degradable petroleum-based plastic food packaging. The combination of both compounds can help to control the release through use of encapsulated core/shell fibers and extend the shelf life of perishable food thereby creating novel antimicrobial active packaging. This will significantly enhance the food's quality and commercial viability.

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