Spectroscopic insights into novel thin electrospun composite membranes based on curdlan, WPI, and synthetic polymers

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Thin electrospun composite membranes based on whey protein isolate (WPI), curdlan, and selected synthetic polymers were successfully fabricated as novel biomaterials for potential applications in tissue engineering. Owing to their fibrous architecture, high surface-to-volume ratio, and tunable physicochemical properties, such membranes are considered promising candidates for supporting cell adhesion, proliferation, and tissue regeneration.

The present work is focused on the detailed physicochemical characterization of the obtained membranes, with particular emphasis on spectroscopic analysis. Fourier Transform Infrared Spectroscopy (FTIR) was employed to investigate the chemical structure, intermolecular interactions, and possible changes resulting from the electrospinning process. Additionally, spectral deconvolution of selected FTIR bands was performed to provide deeper insight into molecular organization and interactions between WPI, curdlan, and synthetic polymer components.

The obtained results contribute to a better understanding of structure–property relationships in electrospun biomaterials and may support the further development of functional membranes for biomedical applications.

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