

Hybrid hydrogels by the co-assembly of chitosan with phospholipids

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Chitosan's (Ch) and Phospholipids (P) have been considered attractive biomolecules, due its set of remarkable biological properties and have been used as building blocks to fabricate functional nano-bio structures (e.g. nanoparticles, capsules/liposomes, emulsions and organogels). At this study we have developed hybrid hydrogels by the co-assembly of chitosan with phospholipid self-assembled particles [1]. The effect of phospholipid content on the morphological and physic-chemical properties of the Ch/P hydrogels was evaluated by Scanning Electron Microscopy (SEM), Dynamic Light Scattering (DLS), Rheology and swelling index measurements.

It was observed that the lower concentration of phospholipids (0.5%.wt/v) enables faster hydrogel network formation, with a lower elastic modulus, than the Ch/P ratios with higher phospholipid content. Morphologically, the internal structures of Ch/P hybrid hydrogels was found to contain nanopores that facilitates the penetration of water and swelling, which tend to slightly increase with the increase of phospholipid content. The use of biocompatible materials, such as chitosan and phospholipids, to produce Ch/P hybrid hydrogels in mild conditions, suggest their potential to be used within life sciences applications.

References:

[1] Mendes AC, Shekarforoush E, Engwer C, Beeren S, Gorzelanny C, Goycoolea FM., Chronakis IS, (2016), Co-assembly of chitosan and phospholipids into hybrid hydrogels, Pure and Applied Chemistry, *In press*.