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Biopolymer based films for wound dressings

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In recent years, various studies have focused on producing and improving treatments for skin regeneration. Polymers are the most important components of these systems in terms of release characteristics and permeation of drugs as well as mechanical properties of the formulations of these systems. The biopolymer films have become a very popular choice since they are biodegradable and biocompatible. In our group we have developed some hydrogels based on gelatin, pectin, starch and alginate to be applied as drug delivery systems. Here we wish to report the preparation of new wound dressings based on chitosan and dicarboxylic acids from renewable sources. Membranes based on pectin and chitosan were also developed. The films were physically, chemically and biologically characterized. Finally, they were loaded with polyhexanide (PHMB) which works as an antiseptic. The hydrophilic properties were evaluated. The effects of the sterilization by gamma irradiation and by heat treatment were accessed and the effect on the final properties of the films was evaluated.



Recent publications

- Carreira A S, Goncalves F A M M, Mendonca P V, Gil M H, Coelho J F J (2010) Temperature and pH responsive polymers based on chitosan: applications and new graft copolymerization strategies based on living radical polymerization. *Carbohydrate Polymers*. 80(3):618-630.
- Goncalves F A M M, Costa C S M F, Fabela I G P, Farinha D, Faneca H Simoes P N et al. (2014) 3D printing of new biobased unsaturated polyesters by microstereo-thermallithography. *Biofabrication*. 6(3):035024.
- Pereira R F, Carvalho A, Gil M H, Mendes A, Bartolo PJ (2013) Influence of Aloe vera on water absorption and enzymatic *in vitro* degradation of alginate hydrogel films. *Carbohydrate Polymers*. 98:311-320.
- Fonseca M A, Abreu B, Goncalves F A M M, Ferreira A G M, Moreira RAS, Oliveira MSA (2013) Shape memory polyurethanes reinforced with carbon nanotubes. *Composite Structures*. 99:105-111.
- Goncalves F A M M, Fonseca A C, Domingos M, Gloria A, Serra A C, Coelho J F J (2017) The potential of unsaturated polyesters in biomedicine and tissue engineering: synthesis, structure-properties relationships and additive manufacturing. *Progress In Polymer Science*. 68:1-34.

Biography

Filipa A M M Goncalves has her expertise in Polymer Synthesis and Characterization. She is currently finishing her PhD in the Chemical Engineering Department at University of Coimbra. She graduated from Évora University in 2007 with a degree on Chemistry and in 2010 she finished her master's degree on Industrial Polymer Applications. Her research interest is focused on the development of biodegradable and biocompatible polymer based on renewable resources. She co-authored 11 papers and her PhD is focused on the synthesis of biodegradable and biocompatible polyesters for applications in tissue engineering.

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