Abstract Template

Abstract Title: PEG-based polymers for controlled Ibuprofen delivery

Margarida Franco[1], Diana Reis[1], Sara Biscaia[1], Pedro Morouço[1]

[1] *Centre for Rapid and Sustainable Product Development (Polytechnic Institute of Leiria, PT)*

Abstract (not more than 300 words)

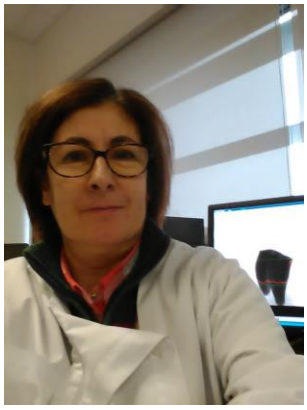
Hydrogels are a group of polymeric materials that can hold large amounts of water within their three-dimensional structures. Simultaneously, they have the capacity of being highly biocompatible, and easily tuneable characteristics. The use of PEG-based polymers as a biomaterial is particularly interesting due to its ease manipulation, and has been vastly explored for pharmaceutical applications. UV photopolymerization is one of the preferable chain polymerization methodologies to produce hydrogels, because is a fast procedure and avoids the exposure to thermal energy. Reactive groups, free radicals like, propagate through the unsaturated vinyl or allyl bonds on PEG-based monomers, resulting in chain polymerization. 2-4-Isobutylphenyl)propanoic acid (ibuprofen) is a nonsteroidal anti-inflammatory agent (NSAIA) with analgesic and antipyretic properties. Ibuprofen has pharmacologic actions like those of other prototypical NSAIAs, which are thought to act through inhibition of prostaglandin synthesis. Topical delivery of non-steroidal anti-inflammatory drugs such as ibuprofen has been explored as a potential method to avoid the first pass metabolism effect and the consequent gastric irritation, which may occur when used *per os*. Although the use of PEG-based polymers in topical semisolid pharmaceutical formulations is not new, this work provides an opportunity to further investigate its drug delivery efficiency. We aimed to encapsulate ibuprofen in photopolymerized membranes, and study its dissolution profile. Membranes production followed a photopolymerization methodology through the action of a UV photoinitiator as a crosslinking agent. Solubility tests were performed to predict sink conditions required for complete drug dissolution. Dissolution assays were carried out and UV spectrophotometry was used for cumulative release percentage determination. The obtained data were mathematically evaluated and fitted into mathematical dependent models; the dissolution efficiency was also determined. The produced membranes are expected to be a promising contribution in the development of new controlled drug delivery systems for ibuprofen topical administration with applications in orthopaedics and ophthalmology.

Keywords—*Biomedical Materials, Hydrogels, Photopolymerization, Controled drug dellivery*

Professional Biography (100-150 words)

Margarida Franco has a master's degree in Pharmaceutical Sciences (Universidade de Lisboa). In her final studies she put an emphasis on the issue "Plant based medicines for topical application in the treatment of skin infections". She worked, for several years, in hematological, biochemical and microbiological analysis as a Biomedical Scientist. Later on, she joined a research group led by J. P. Dehaye at the department of Biochimie Generale et Humaine de l'Université Libre de Bruxelles (ULB). Later on, she worked in two high school laboratories in London. Nowadays, as a Centre for Rapid and Sustainable Product Development (CDRSP)

team member, she runs a research work regarding biomaterials for controlled drug delivery. Lately, her interests have expanded to include microcomputed tomography (micro-CT) technology, namely in the endodontic area exploring the anatomy of the root canal. She is also co-responsible for the CDRSP materials characterization laboratory.



Email Id: margarida.franco@ipleiria.pt

Any Comments: