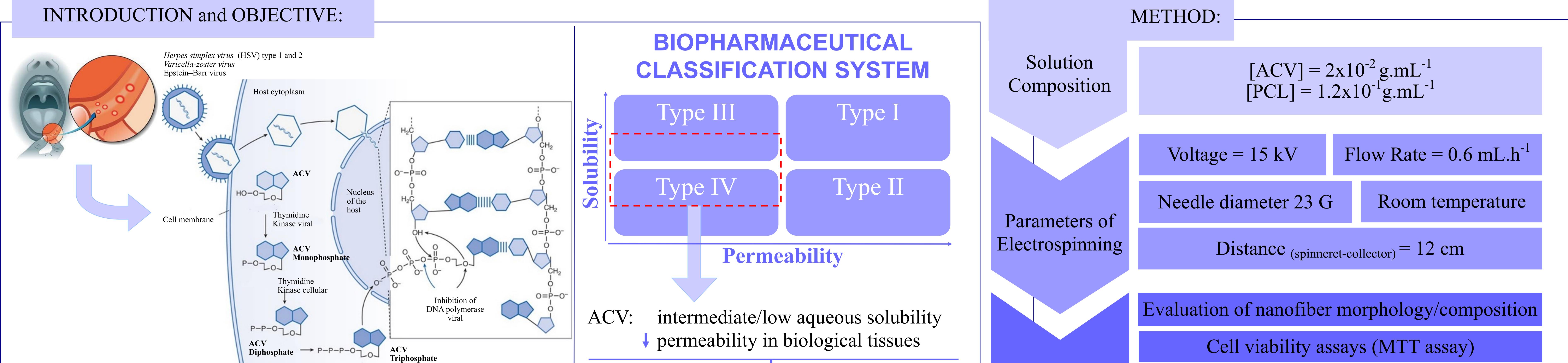


**University of Minho CFUM / Physics Department** 

## **RELEASE OF ACYCLOVIR FROM POLYMERIC NANOFIBERS: COMPARING AQUEOUS VERSUS MEMBRANE-WATER INTERFACES KINETICS**

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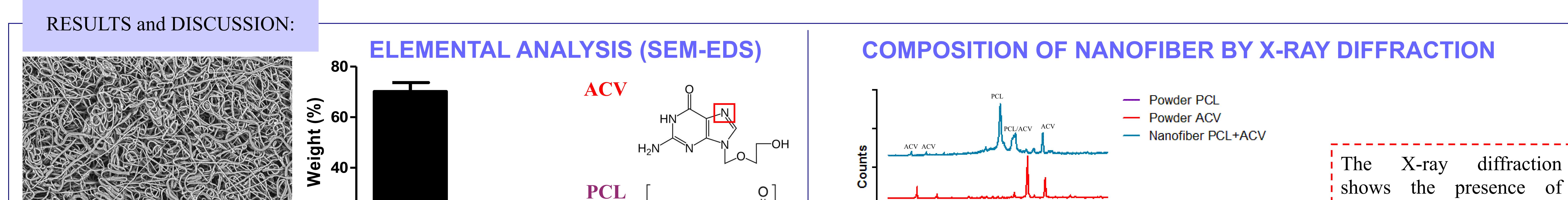
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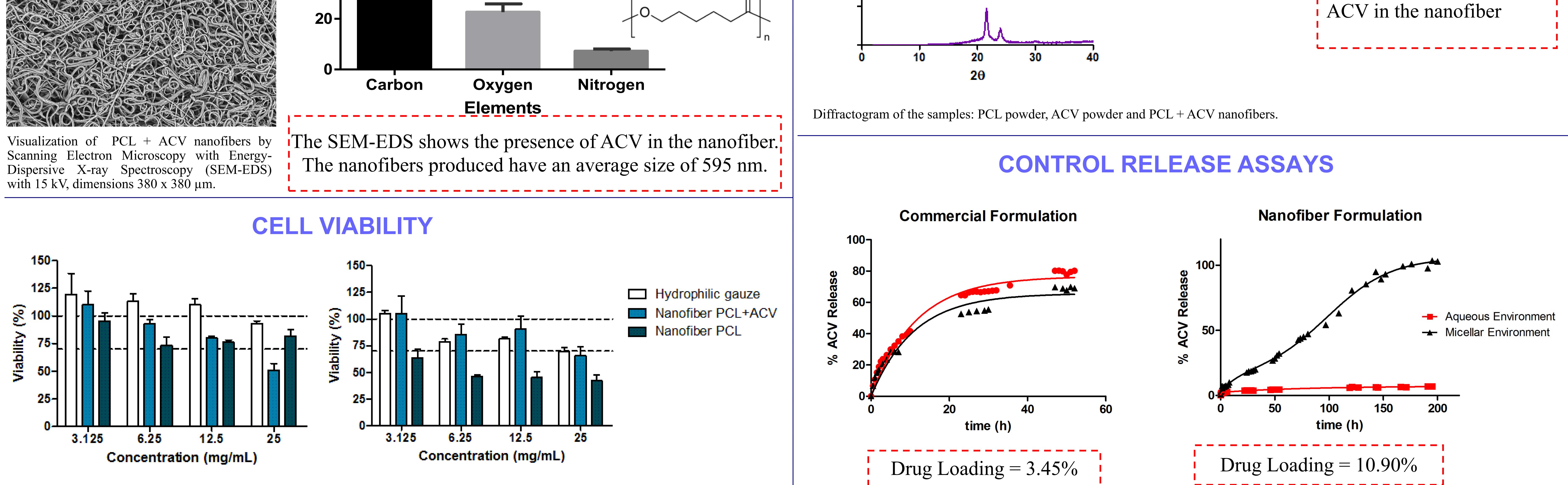


The objective of this study is to develop a novel system for acyclovir (ACV) controlled release after cutaneous application through the encapsulation of the drug into polymeric nanofibers of policaprolactone (PCL) produced by the electrospinning technique limitations top1cal conventional the overcome the 01 to tormulations.

Characterization Controlled release assays at Low bioavailability in the organism Methods repeated administration of high doses interface).

physiological conditions (pH 5.5 and 37 °C) in aqueous or in micellar environment (to mimic the biological





Viability of epidermal keratinocytes - HaCaT (left) and human foreskin fibroblasts HFF-1 (right) assessed by the MTT assay after 24 1 incubation with extracts of PCL fibers and hydrophilic gauze. Columns represent mean values and error bars the standard deviation (n=3). The nanofibers presented acceptable cell viability up to a concentration of 25 mg/mL.	<ul> <li>Release profile of ACV: Commercial cream formulation (left) and nanofiber formulation (right) in aqueous environment and micellar environment.</li> <li>The ACV release profile of the nanofibers in micellar environment is more sustained and more pronounced (when compared to the aqueous environment and the commercial formulation).</li> </ul>
The electrospinning technique was efficient in producing ACV-loaded nanofibers, being a promising approach to reach a more sustained drug release profile. Moreover, the biological interface (micellar environment) showed to be an important parameter in allowing the assess-	<ul> <li>References:</li> <li>[1]A. J. Sawdon and C. Peng, Polymeric micelles for acyclovir drug delivery. Colloids Surf. B: Biointerfaces, 8 (2014) 738-745.</li> <li>[2] J. W. Gnann, N. H. Barton and R. J. Whitley, Acyclovir: mechanism of action, pharmacokinetics, safety and clinical applications. Pharmacotherapy (1983) 275-283.</li> <li>[3] M. Parsa, M. Javad, M. S. H. Reza, D. Simin, E. S. Ahmed, B. Bahram and H. Azadeh, Preparation and evaluation of the antiviral activity of acyclovir loaded nano-niosomes against Herpes Simplex virus type 1. Pharmacophore, 5 (2014), 483–493.</li> <li>[4] M. Kubbinga, M. A. Nguyen, P. Staubach, S. Teerenstra and P. Langguth, The influence of chitosan on the oral bioavailability of acyclovir - a comparative bioavailability study in HumaPharm. Res., 32 (2015) 2241–2249.</li> </ul>

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