

Abstract

# Ionic liquids: game changers for the development of controlled delivery systems? †

Ana Júlio<sup>1,2,\*</sup>, Anaisa Sultane<sup>3</sup>, Ana S. Viana<sup>4</sup>, Catarina Rosado<sup>1</sup>, João G. Costa<sup>1</sup>, Joana P. Mota<sup>1,5</sup>, Tânia Santos de Almeida<sup>1,4</sup>, Catarina Pereira-Leite<sup>1,6</sup>

<sup>1</sup> CBIOS – Universidade Lusófona’s Research Center for Biosciences & Health Technologies, Campo Grande 376, 1749-024 Lisboa, Portugal; ana.julio@ulusofona.pt (A.J.), catarina.rosado@ulusofona.pt (C.R.), jgcosta@ulusofona.pt (J.G.C.), joana.mota@ulusofona.pt (J.P.M.), tania.almeida@ulusofona.pt (T.S.A.), catarina.leite@ulusofona.pt (C.P.-L.)

<sup>2</sup> Department of Biomedical Sciences, University of Alcalá, Ctra. Madrid-Barcelona Km. 33.600, Alcalá de Henares, 28871 Madrid, Spain.

<sup>3</sup> School of Sciences and Health Technologies, Lusófona University, Campo Grande 376, 1749-024 Lisboa, Portugal. asultane@gmail.com (A.S.)

<sup>4</sup> Centro de Química Estrutural, Faculdade de Ciências, Universidade de Lisboa, Campo Grande, 1749-016 Lisboa, Portugal. anaviana@fc.ul.pt (A.S.V.)

<sup>5</sup> Zendal Portugal, Largo 5 de Outubro, N<sup>o</sup> 19-1<sup>o</sup> 4940-521 Paredes de Coura, Portugal.

<sup>6</sup> LAQV, REQUIMTE, Departamento de Ciências Químicas, Faculdade de Farmácia, Universidade do Porto, 4050-313 Porto, Portugal

\* Correspondence: ana.julio@ulusofona.pt; Tel.: +351 217515500

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**Abstract:** Poor drug solubility or loading, inflexible drug release profiles, and poor storage stability are some of the most difficult issues to surpass in the production of efficient and safe controlled delivery systems. Due to their suitable properties, ionic liquids (ILs) may be used as new functional materials to overcome these drawbacks. ILs are organic salts, which may be introduced in different types of drug delivery systems. Herein, 5 ILs were synthesized and their applicability in drug delivery systems was evaluated. Firstly, their cytotoxicity in human keratinocytes was evaluated, and considering that, it was developed the controlled drug delivery systems with or without ILs. Each IL was incorporated at their upper concentration allowing the maintenance of cell viability. Lipidic implants and transfersomes without and with IL (TransfersomILs) were the chosen lipid-based controlled delivery systems to investigate the impact of adding ILs. In these studies, rutin was used as model drug with poor aqueous solubility. Our results showed that ILs promoted a significantly higher drug loading, with choline-based ILs displaying better results when compared with imidazole-based ILs. The incorporation of ILs showed that they seem to modulate release profile of drug from lipidic implants. Regarding TransfersomILs, they demonstrated a higher association efficiency with a higher total amount of drug release, and better colloidal and storage stability when compared with transfersomes without ILs. In conclusion, the incorporation of ILs, at non-toxic concentrations, allowed the development of more efficient controlled delivery systems, showing that ILs may be multifunctional and valuable materials to boost the performance of delivery systems.

**Keywords:** Ionic liquids; rutin; controlled delivery systems; TransfersomILs; lipidic implants.

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