Title: Reusability of L-asparaginase immobilized on silica-based supported ionic liquids

Abstract (max 250 words): L-asparaginase (ASNase) is an aminohydrolase enzyme used as an anticancer drug, e.g. in the treatment of acute lymphoblastic leukemia, in acrylamide reduction and in biosensing. Nevertheless, its low stability and thermolability, and susceptibility to proteases, hinder its application in the health and food industries. Hence, the improvement of its properties through efficient immobilization methods is in high demand. Thus, this work aims the development of silica-based supported ionic liquids (SILs) for the ASNase immobilization to improve its stability and enable its reusability. While activated silica with no ILs only kept total initial ASNase activity during the first cycle of reaction, SILs allowed 5 cycles of reaction, keeping 82% of initial ASNase activity, reinforcing their potential as alternative enzymatic supports.

Hashtags / Keywords: L-asparaginase1; silica-based supported ionic liquids2; immobilization3; enzyme reusability4

Research line: L4 – Health

Authors: João C. F. Nunes (a), Rui M. F. Bento (a), Mafalda R. Almeida (a), Valéria C. Santos-Ebinuma (b), Márcia C. Neves (a), Ana P. M. Tavares (a), Mara G. Freire (a)

Affiliations: (a) CICECO - Aveiro Institute of Materials, Department of Chemistry, University of Aveiro, 3810-193 Aveiro, Portugal

(b) Department of Engineering Bioprocess and Biotechnology, School of Pharmaceutical Sciences, UNESP-University Estadual Paulista, Araraquara, Brazil

E-mail of the presenting author: jcfn@ua.pt

Acknowledgments: This work was developed within the scope of the project CICECO-Aveiro Institute of Materials, UIDB/50011/2020 & UIDP/50011/2020, financed by national funds through the Portuguese Foundation for Science and Technology/MCTES, and project POCI-01-0145-FEDER-031268 - funded by FEDER, COMPETE2020, POCI and OE. Ana P.M. Tavares and Márcia C. Neves acknowledge FCT for the research contract CEECIND/2020/01867 and CEECIND/00383/2017, respectively. Valéria C. Santos-Ebinuma acknowledges FAPESP (2018/06908-8) for financial support. João C. F. Nunes acknowledges SPQ and FCT for the PhD fellowship (SFRH/BD/150671/2020).

https://twitter.com/joocfnunes1/status/1437474852491993096?s=21