MARIE SKŁODOWSKA-CURIE POSTDOCTORAL FELLOWSHIPS 2023

EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

HOST INSTITUTION *(Organic Unit and R&D Unit to which the supervisor is affiliated)*

Instituto de Tecnologia Química e Biológica António Xavier (ITQB NOVA)

RESEARCH GROUP AND URL

Bio-oriented Supramolecular Chemistry lab (BSupraChem)
https://www.itqb.unl.pt/research/chemistry/bio-oriented-supramolecular-chemistry

SUPERVISOR (NAME AND E-MAIL)

Pedro Mateus (pmateus@itqb.unl.pt)

SHORT CV OF THE SUPERVISOR

Pedro Mateus completed his degree in Technological Chemistry in 2004, at FCUL, and his PhD in Chemistry at ITQB NOVA, in 2011. His doctoral work focused on anion recognition by macrobicyclic compounds. Soon after, he received a fellowship to develop metal complexes to bind carboxylates, amino acids and phosphates, also at ITQB NOVA. In 2015, he moved to the IECB (U. Bordeaux, France), as a Marie Skłodowska-Curie post-doctoral fellow to develop metallofoldamers for saccharide recognition. He also worked as a contracted researcher in the CHaRM group at FCT NOVA (2019-2020), developing photo-responsive self-assembled nanomaterials. In late 2021, he secured an Auxiliary Researcher position at ITQB NOVA, through the highly competitive CEEC Individual – 4th ed.. Pedro heads the BSupraChem lab, which explores supramolecular-based approaches to tackle problems at the interface of Chemistry and Biology. For that purpose, the lab seeks to develop new chemical entities to bind bio-relevant substrates, to be used either as chemical probes or to interfere with pathologic biological processes. www.cienciavitae.pt/portal/3D1E-B18E-3EAF

5 SELECTED PUBLICATIONS *(of the Supervisor or of the Project proposed)*

- P. Mateus, A. Jacquet, A. Méndez-Ardoy, B. Kauffmann, G. Pecastaings, T. Buffeteau, Y. Ferrand, I. Huc, D. M. Bassani, *Chem. Sci.* 2021, *12*, 3743. 10.1039/D0SC06060G
- J. Atcher, P. Mateus, B. Kauffmann, F. Rosu, V. Maurizot, I. Huc, *Angew.Chem. Int. Ed.* 2021, *60*, 2574. Very Important Paper. 10.1002/anie.202014670
- P. Mateus, N. Chandramouli, C. D. Mackereth, B. Kauffmann, Y. Ferrand, I. Huc, *Angew.Chem.Int. Ed.* 2020, *59*, 5797. 10.1002/anie.201914929
- P. Mateus, B. Wicher, Y. Ferrand, I. Huc, *Chem. Commun.* 2018, *54*, 5078. 10.1039/C8CC02360C
- P. Mateus, B. Wicher, Y. Ferrand, I. Huc, *Chem. Commun.* 2017, *53*, 9300. 10.1039/C7CC05422J

PROJECT TITLE AND SHORT DESCRIPTION

New glycoprotein-mimetic platforms for bacterial adhesion inhibition

Antimicrobial resistance has been declared by the WHO as one of the major public health problems of the 21st century. Antivirulence agents promise to circumvent resistance by disarming the pathogen as opposed to affecting growth or viability.[1] A common strategy consists in interfering with adhesion of the pathogen to the host, which is mediated by proteins that bind multiple carbohydrate structures displayed on the host cell surface.[2] To develop inhibitors of such interactions, many molecular scaffolds have been devised for the multivalent presentation of carbohydrates.[3] However, few allow a precise control of number, orientation, and distance between carbohydrates, which is fundamental to maximize biological activity. This research will consist in developing new molecular platforms that allow a well-defined display of

carbohydrates, to mimic the naturally occurring glycoproteins that decorate host cell surfaces and to competitively interfere with the recognition processes between host cells and pathogens.

[1] S. W. Dickey et al., *Nat. Rev.* 2017, *16*, 457; [2] A. M. Krachler and K. Orth, *Virulence* 2013, *4*, 284; [3] S. Sattin and A. Bernardi, Trends Biotechnol. 2016, 34, 483.

SCIENTIFIC AREA WHERE THE PROJECT FITS BEST*

Chemistry (CHE)