**MARIE SKŁODOWSKA-CURIE POSTDOCTORAL FELLOWSHIPS 2024**

***EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS***

## HOST INSTITUTION

UCIBIO, Applied Molecular Biosciences Unit, Department of Life Sciences, NOVA School of Science and Technology, Universidade NOVA de Lisboa,

## RESEARCH GROUP AND URL

Glycoimmunology Group
https://www.ucibio.pt/people/paula-alexandra-quintela-videira

## SUPERVISOR (NAME AND E-MAIL)

Paula Videira p.videira@fct.unl.pt

## SHORT CV OF THE SUPERVISOR

I am Paula Videira, leader of the Glycoimmunology Research Group at UCIBIO, Associate Professor with habilitation in Immunology and Glycobiology at the Life Sciences Department of NOVA School of Science and Technology, Universidade NOVA de Lisboa (NOVA-FCT, PT). I am highly motivated to comprehend the intricate roles of glycans in diseases, dedicated to translating Glycosciences into innovative glycan-based immunotherapies, centered on patient needs. I am currently focused on i) mechanisms and clinical implications of aberrant sialylated short O-glycans in cancers. ii) glycan's role in immunomodulatory molecules and immune responses. iii) immunity and novel therapies for Congenital defects of glycosylation (CDG). iv) anti-glycan antibodies and glycan-based therapeutic technologies.

In the past few years, my efforts were fruitful in several ways: (A) We published 108 research papers and four patents (as PI) describing various roles of glycans, in several top-ranked journals (e.g. BBA, Molecular Oncology); a featured immunology article (doi: 10.4049/jimmunol.1890012); 11 invited reviews (highly cited doi: 10.3390/ijms19051304), and 2 clinical guidelines (B) Me (plenary, keynote and invited speaker, moderator, chair) and my students have presented unpublished data in several international conferences (e.g. EuroCarb, SSIEM, AAI, PEGS). Noteworthy, my students' work was selected for several prestigious meetings. (C) I secured almost 4.5 million EUR for research plus 1.4 million EUR to spin-off our technology, including prestigious EU grants (Twinning, MSCA, EJPRD), prizes and research agreements with biopharmaceuticals. Important, my students and researchers secured individual fellowships. (D) I belonged to the Scientific Council of COST, and I am currently part of the IAB of the Slovak Academy of Sciences and RD-Portugal, editorial board of Scientific Reports, guest editor and reviewer of several journals and international research applications. (E) I organize international courses and congresses, including the Glyco- e-learning course. (F) I co-founded the CDG&Allies-PPAIN, a unique patient-centric network, that gathers professionals and patient associations worldwide to foster research and awareness on rare diseases of glycosylation, producing several outcomes including lay language documents for society. (G) In 2019, I co-founded the spin-off CellmAbs, a biopharmaceutical developing immuno-oncology agents for tumour glycans. Awarded several times, CellmAbs secured investments and closed in 2024 a historic negotiation with a

big pharmaceutical to step our technology into clinics. In 2024, I co-founded Valvian a novel biopharmaceutical centered on AI-driven novel immune therapies.
My research is highly multidisciplinary and uses cutting-edge in vitro and in vivo assays, omics, bioinformatic tools and patient-centric approaches to translate research findings into patient benefits.

## 5 SELECTED PUBLICATIONS


Carlota Pascoal; Mylène A. Carrascal; Daniela F. Barreira; Rita A. Lourenço; Pedro Granjo; Ana R. Grosso; Paula Borralho; Sofia Braga; Paula A. Videira. "Sialyl LewisX/A and Cytokeratin Crosstalk in Triple Negative Breast Cancer". *Cancers* (2023): https://doi.org/10.3390/cancers15030731.

Deschepper, Fanny M.; Zoppi, Roberta; Pirro, Martina; Hensbergen, Paul J.; Dall'Olio, Fabio; Kotsias, Maximillianos; Gardner, Richard A.; Spencer, Daniel I.R.; Videira, Paula A.. "L1CAM as an E-selectin Ligand in Colon Cancer". *International Journal of Molecular Sciences* 21 21 (2020): 8286. http://dx.doi.org/10.3390/ijms21218286.

Loureiro, Liliana R.; Feldmann, Anja; Bergmann, Ralf; Koristka, Stefanie; Berndt, Nicole; Máthé, Domokos; Hegedüs, Nikolett; et al. "Extended half-life target module for sustainable UniCAR T-cell treatment of STn-expressing cancers". *Journal of Experimental & Clinical Cancer Research* 39 1 (2020): http://dx.doi.org/10.1186/s13046-020-01572-4.

Zélia Silva; Tiago Ferro; Danielle Almeida; Helena Soares; José Alexandre Ferreira; Fanny M. Deschepper; Paul J. Hensbergen; et al. "MHC Class I Stability is Modulated by Cell Surface Sialylation in Human Dendritic Cells". *Pharmaceutics* (2020): https://www.mdpi.com/1999-4923/12/3/249.

Liliana R Loureiro; Diana P Sousa; Dylan Ferreira; Wengang Chai; Luís M. P. Lima; Carina Pereira; Carla B Lopes; et al. "Novel monoclonal antibody L2A5 specifically targeting sialyl-Tn and short glycans terminated by alpha-2-6 sialic acids". *Scientific Reports* 8 1 (2018): 12196-12196. doi: 10.1038/s41598-018-30421-w


## PROJECT TITLE AND SHORT DESCRIPTION

**SiaDIS – From the molecular basis to the future of therapeutics in Sialylation-related DISeases**
SiaDIS is a groundbreaking initiative aimed at improving our understanding of sialylation-related diseases, such as GNE myopathy (GNEM), towards drug discovery.

Sialylation, as the end-product of sialic acid (Sia) biosynthesis and addition to glycans, is key for several biological processes, including cell recognition, interaction, and signaling. Several pathologies have altered sialylation (e.g., inflammation, malignancy), and the roles of Sia in physiopathology provide opportunities for therapeutic development.

GNEM (OMIM 605820) is caused by mutations in the GNE gene that encodes for a bifunctional enzyme required for Sia biosynthesis, resulting in decreased Sia levels (hyposialylation) in muscle tissue that progressively manifests as muscle atrophy and weakness, ultimately leading to wheelchair use and dependence on a caregiver.

Due to a) the rare incidence of the disease (1-9:1,000,000 people worldwide), b) the limited preclinical models, c) the lack of reliable biomarkers, and d) the slow disease progression, there is

still an incipient understanding of GNEM pathophysiology. Yes Sia biosynthesis is related with several more common diseases such as cancer and autoimmune diseases.

SiaDIS, prompted by and based on previous European initiatives, where we have been actively engaged, seeks to address specific scientific challenges in GNEM, namely, unveiling biomolecular mechanisms that lead to this debilitating disease and other sialylation-related disorders, as means of identifying alternative therapeutic targets and strategies, and reliable biomarkers to support clinical development.

SiaDIS complies with the research developed at the research Unit UCIBIO and meets the FCT-NOVA institutional strategic plan that advocates a continued investment in basic research as the foundation of medical discovery. Also addressing the Goal 3 of Agenda 2030 - Ensure healthy lives and promote well-being for all, at all ages, the SiaDIS project is set up around:

-A Chemical Biology approach, identifying targets potentially involved in different pathways of the disease. This will be accomplished by exploring relevant biomolecular pathomechanisms that may lead to disease progression in cell and animal models.

-A Pharmacological approach, discovering new drug candidates to enter clinical trials. Proof-of-principle studies fostering innovative therapeutics will be conducted by using and taking advantage of a pre-clinical testing platform of Sia-deficient models established at UCIBIO.

-A Patient-centric approach, involving and empowering patients in research priorities, by engaging Patient Advocacy Organizations (PAO) at the starting point of the project.

SiaDIS will involve multistakeholders interested in exploiting the know-how, tools and technology, by applying a strong science communication and dissemination, making scientific discovery accessible to and understandable by all. The project aims to highlight the importance of studying sialoglycans in the pathophysiology of major human diseases, going beyond the initial proposal.

## SCIENTIFIC AREA WHERE THE PROJECT FITS BEST*

Life Sciences (LIF)

***Scientific Area where the project fits best** – Please select/indicate the scientific area according to the panel evaluation areas: Chemistry (CHE) • Social Sciences and Humanities (SOC) • Economic Sciences (ECO) • Information Science and Engineering (ENG) • Environment and Geosciences (ENV) • Life Sciences (LIF) • Mathematics (MAT) • Physics (PHY)