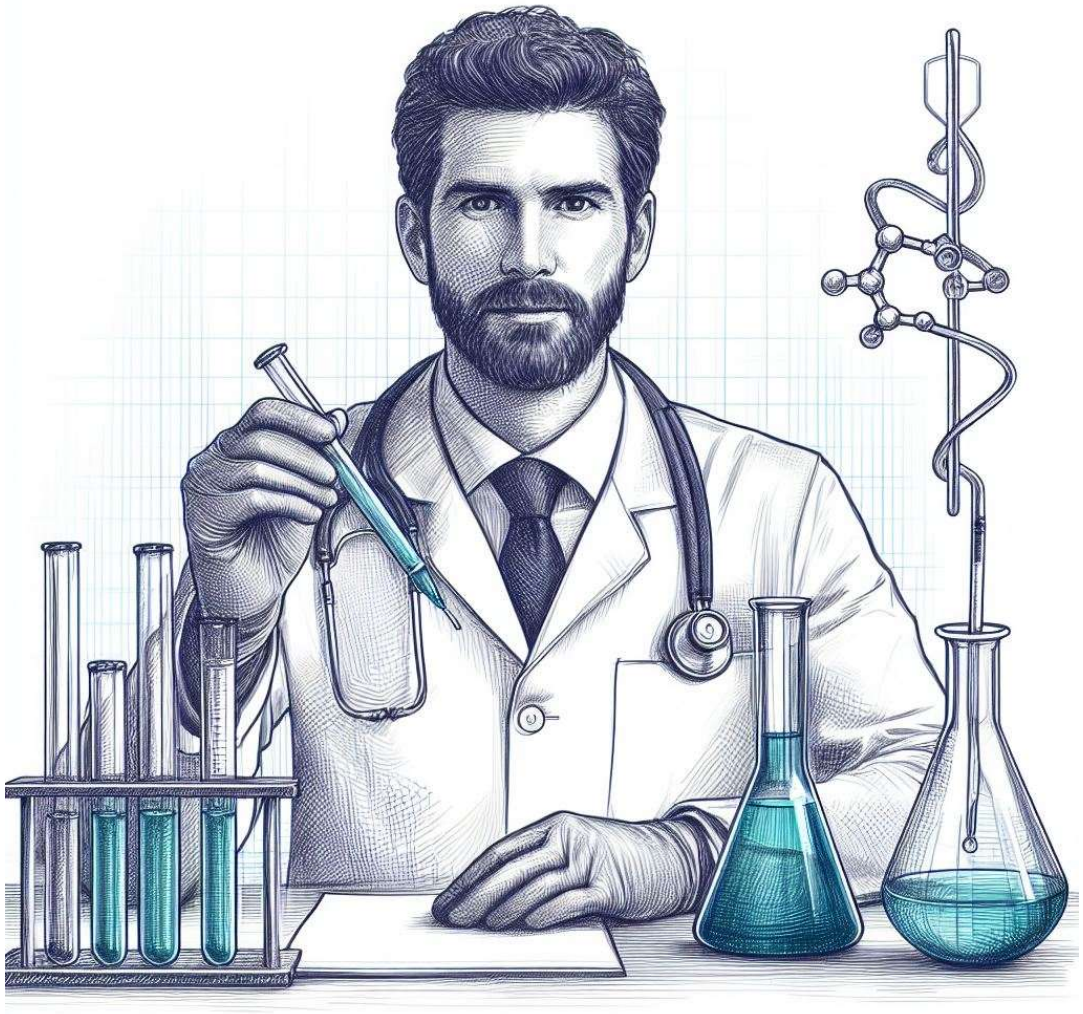


WORKSHOP IN GLYCOBIOLOGY – STRUCTURES AND FUNCTIONS OF GLYCANS IN HUMAN PATHOLOGIES

Inserm

cnrs

PORTO. COMPREHENSIVE CANCER CENTRE

IPOPORTO
INSTITUTO PORTUGUÊS DE ONCOLOGIA DO PORTO FG, EPE

3S INSTITUTO DE INVESTIGAÇÃO E INOVAÇÃO EM SAÚDE UNIVERSIDADE DO PORTO

Université de Lille

CHU LILLE

UNIVERSITÉ DE LORRAINE

Yann Guérardel, 51 years

Senior Research at CNRS
Director of Institute for Structural and Functional Glycobiology, CNRS, Lille
Prof. iGCORE Nagoya University Japan
170 publications, 4 patents

- **Structural analyses** of animal and prokaryotic glycans – MS, NMR, GC/MS
- Understand the relation between **structure and functions of complex glycans**
- Function of **glycosylation enzymes**
- Role of glycans in **infection**
- Glycan-Protein **interactions**

José Alexandre Ferreira, 44 years

PORTO. COMPREHENSIVE CANCER CENTRE

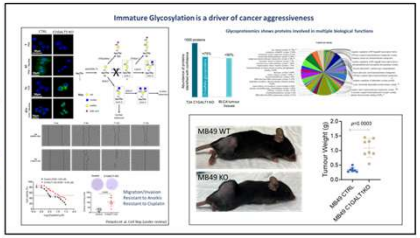
IPOPORTO
INSTITUTO PORTUGUÊS DE ONCOLOGIA DO PORTO FG, EPE

Principal Investigator at IPO-Porto
Director of the Proteomics Core Unit at IPO-Porto
CEO de GlycoMatters Biotech
65 publications, 4 patents on glycans for clinical applications (POC, moAbs, vaccines)

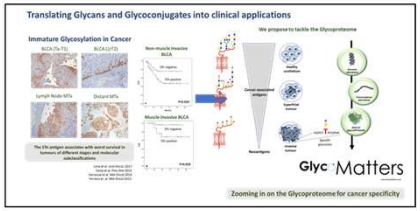
- Glycomics and Glycoproteomics for **Precision Medicine**
- Cancer **Glycobiology**
- Glycan-based **cancer immunotherapies**

www.GlycoMatters.com

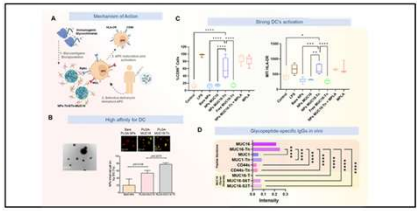
Functional Glycoprotegenomics



Translational Glycobiology



Glycan Therapies



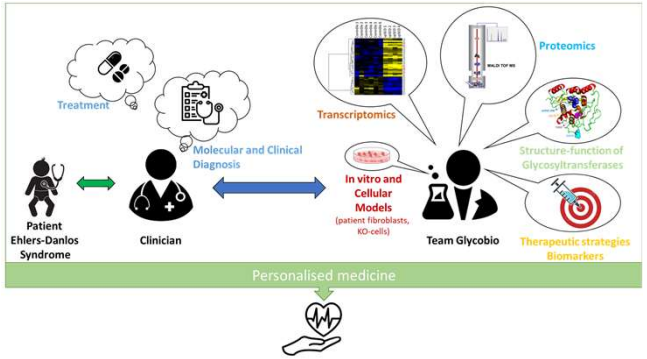
Catherine Bui, 43 years

UNIVERSITÉ DE LORRAINE

IMoPA
Ingénierie moléculaire, cellulaire & physiopathologie

Professor Associate at University of Lorraine
UMR7365 IMoPA, Team GlycoBio
14 publications

- **Proteoglycans** and structure-function of **glycosyltransferases**
- Study of proteoglycans and collagen interaction
- Rare connective tissue disorders with **glycosaminoglycans deficiencies**



Networks for Communication

- Groupe Français des Glucides
- GDR Modifications Post-Traductionnelle des Bactéries
- GDR GAGosciences
- GDR Chemical Biology
- IRN UGSF-iGCORE GlycoNetwork

- Association portugaise de protéomique
- Division des glucides - Société portugaise de chimie
- European Glycosciences Community
- GLYCOTwinning
- Canadian Glycomic Network (GlycoNet)

- GlycoEst Glycobiology Network in Grand Est
- Groupe Français des Glucides

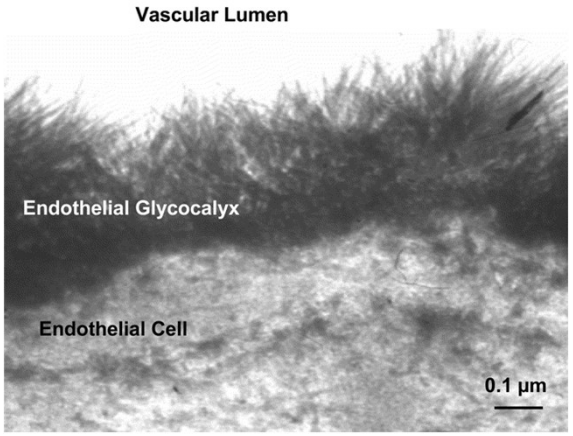
Organization experience

- EMBO Workshop Glycoscience and Development
- SialoGlyco2024
- Joint Glycobiology Meeting (every 4 years)
- Ecoles thématiques (GDR BPTM & ChemBiol)
- UGSF-iGCORE GlycoNetwork meetings
- Advances in Glycosciences workshop 2024

- IPO-Porto International Scientific Meetings (since 2022)
- IPO-Porto young researcher's symphosia (2023)
- P.ccc entrepreneurship courses (since 2023)
- Thematic workshops on mass spectrometry, glycomics, glycoproteomics (since 2015)

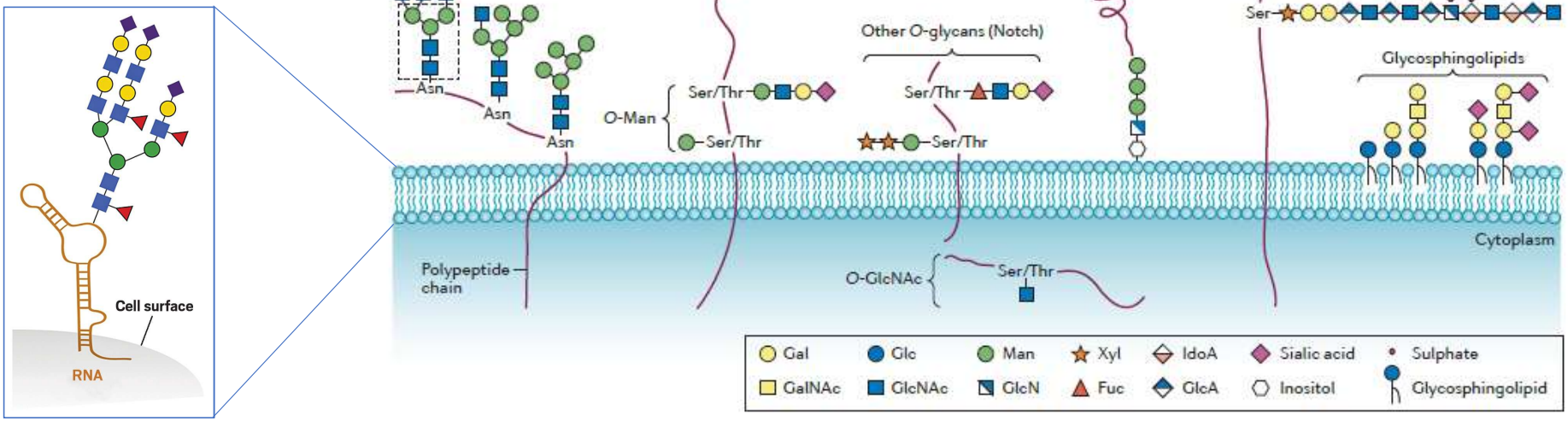
- Joint workshop of the international associated laboratory Nancy-Dundee (2017) on Glycans and Proteoglycans
- IMoPA scientific seminars (since 2023)

The Glycosylation of Eukaryotic Cells



Every Living Cell in Nature is Covered with a Dense and Complex Array of Sugar Chains (Glycans)

Varki A et al. Cell 2006



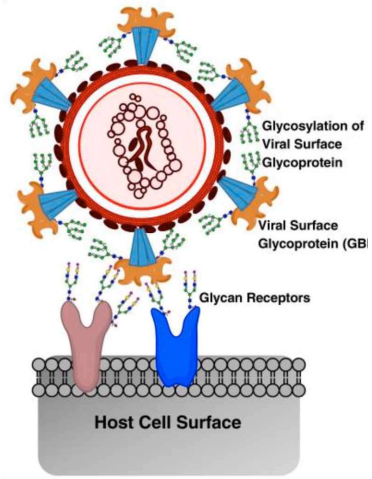
Pinho and Reis Nat Rev Cancer 2015

glycoRNA

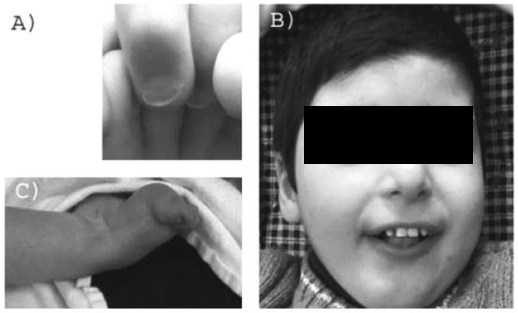
Flynn et al. Cell 2021

Glycosylation provides identity and function to molecules and cells

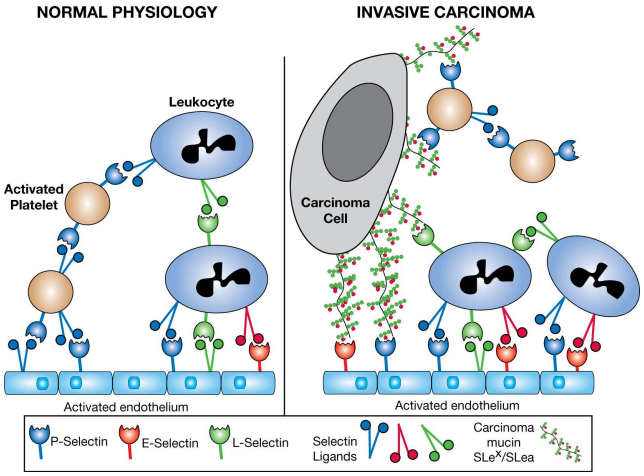
Glycans are essential to the comprehension of pathologies



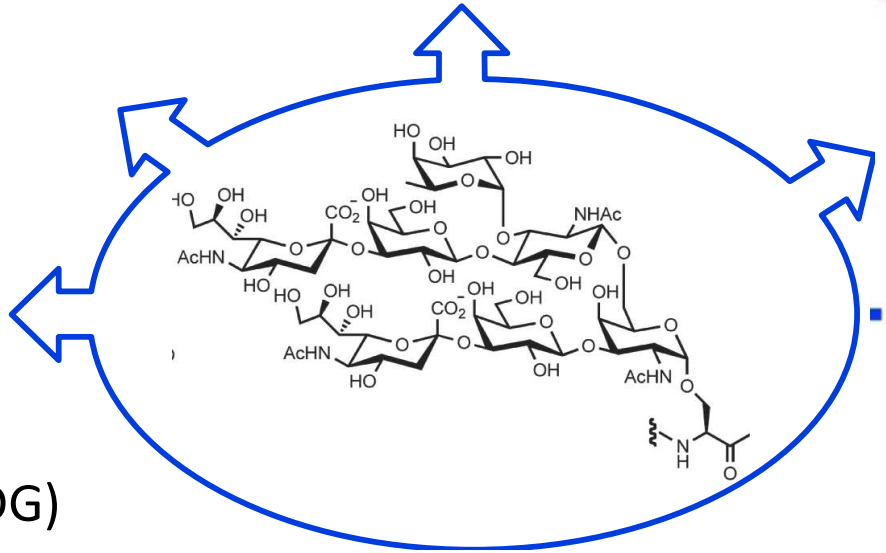
Bacterial and Viral Infections

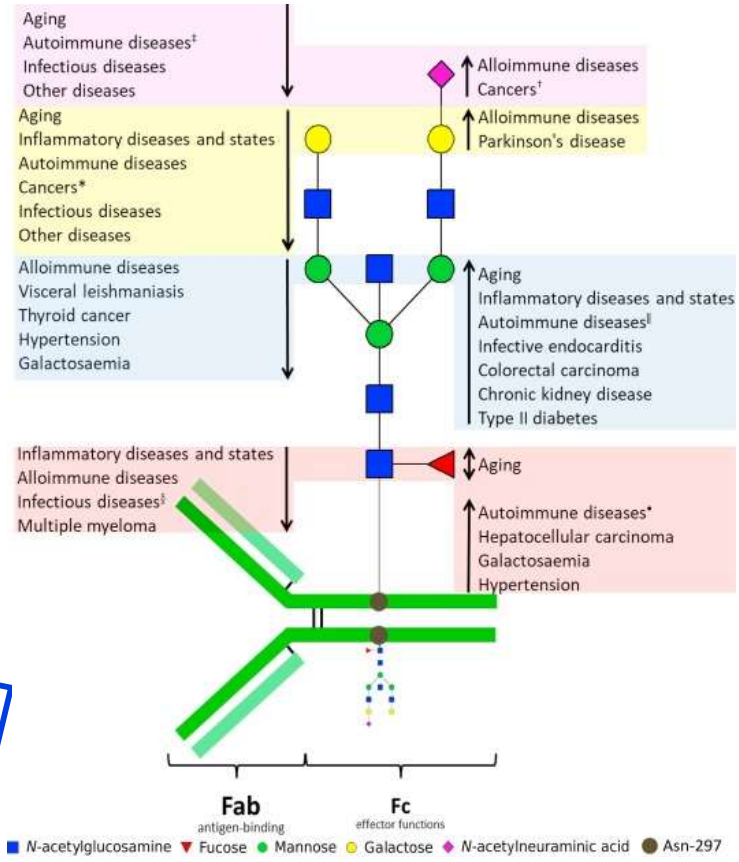


Genetic Disorders (CDG)



Cancer





Regulation of Ig functions

Science Behind Glycans

"Glycans are directly involved in the pathophysiology of every major disease... Additional knowledge from glycoscience will be needed to realize the goals of personalized medicine and to take advantage of the substantial investments in human genome and proteome research and its impact on human health."

- US National Academies, 2012

GlycoNet

Why is glycomics important?

In 2020, 5 of the top 10 selling drugs are glycosylated and have a combined revenue of **US$58B**.

Global market for glycomics drugs to reach **US$257B by 2028.**

Glycan-based Clinical Applications

Serological Biomarkers of Cancer

CA19-9 (Sialyl-Lewis A)
Pancreatic cancer

CA72-3 (Cancer Antigen 72-3)
Gastric, colorectal, pancreatic cancers

AFP-L3 (glycoproteoform alpha-fetoprotein)
Hepatocellular Carcinoma

CA135 (MUC16)
Ovarian

CA15-3 (MUC1)
Breast cancer

Prostate-Specific Antigen (PSA)
Prostate

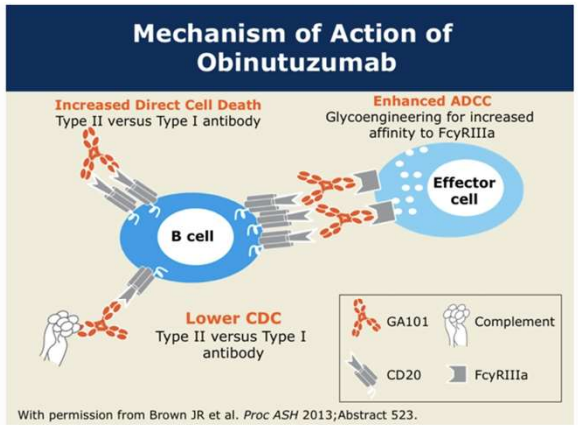
CEA
Colorectal cancer

Glypican-3
Hepatocellular carcinoma

Glycan-based Vaccines

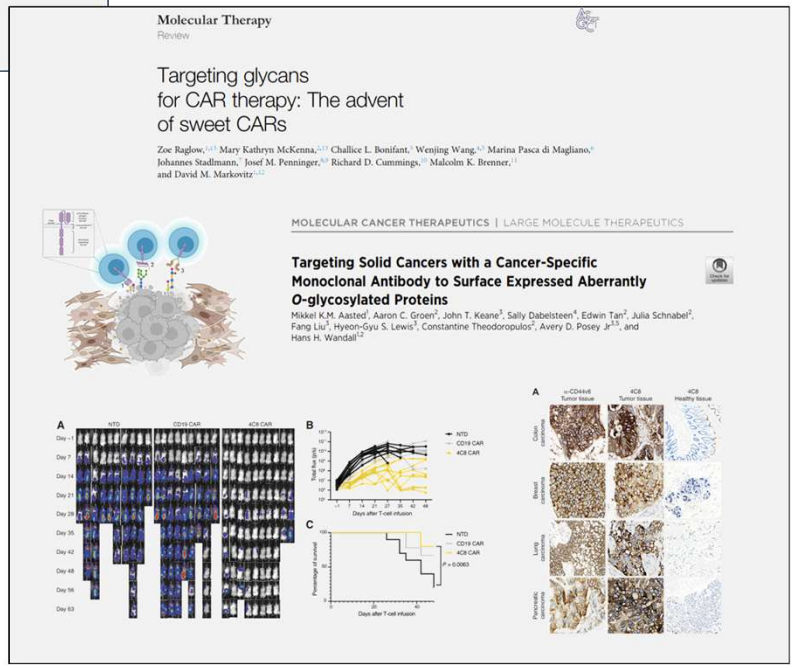
Pneumococcal capsule conjugate (PCV)

Haemophilus influenzae type b (Hib)

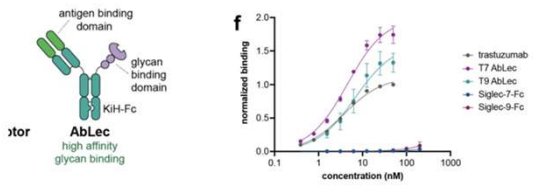


Trastuzumab (Herceptin): anti-HER2

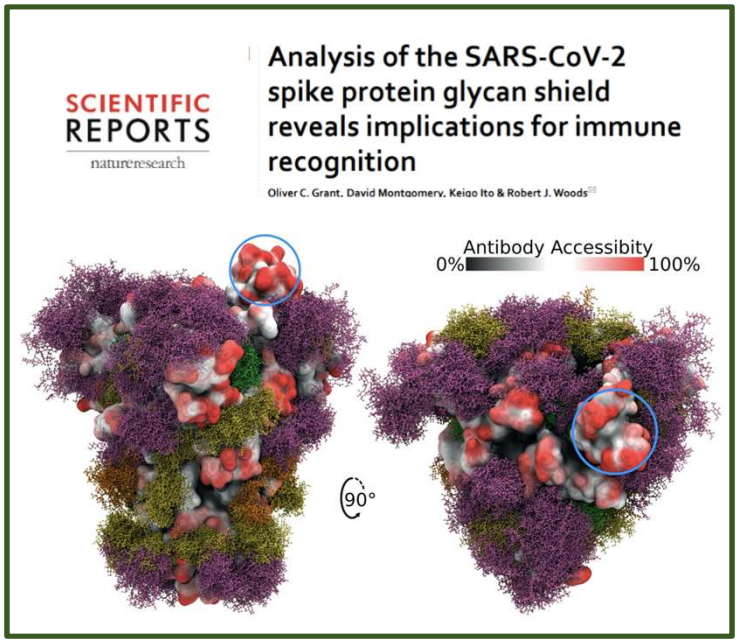
Atezolizumab (Tecentriq): anti-PDL1

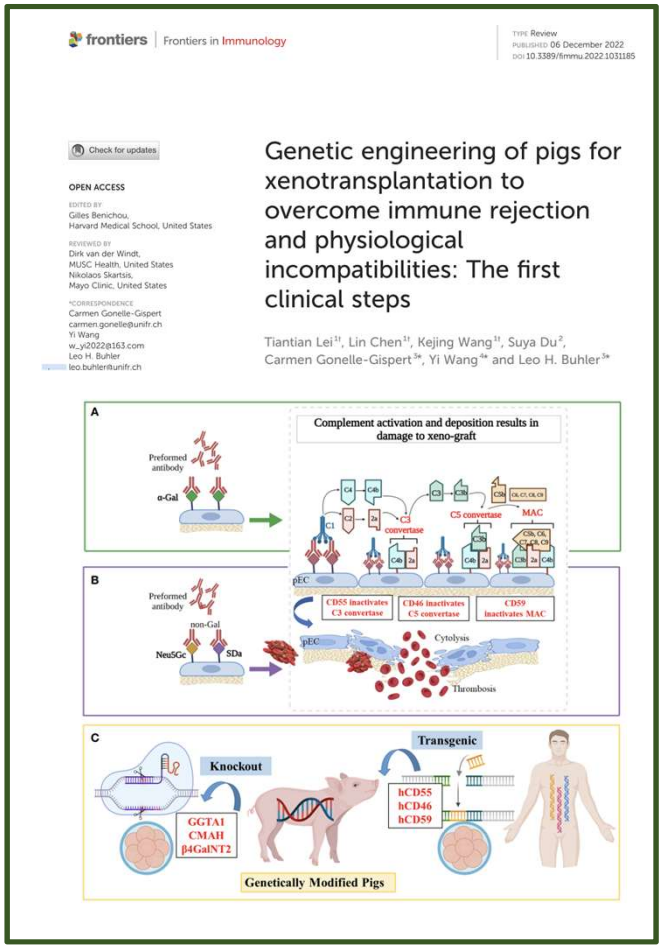


Targeted removal of Siglec ligands in the tumor microenvironment, using an **antibody-sialidase conjugate**, enhanced antitumor immunity and halted tumor progression in several murine models.

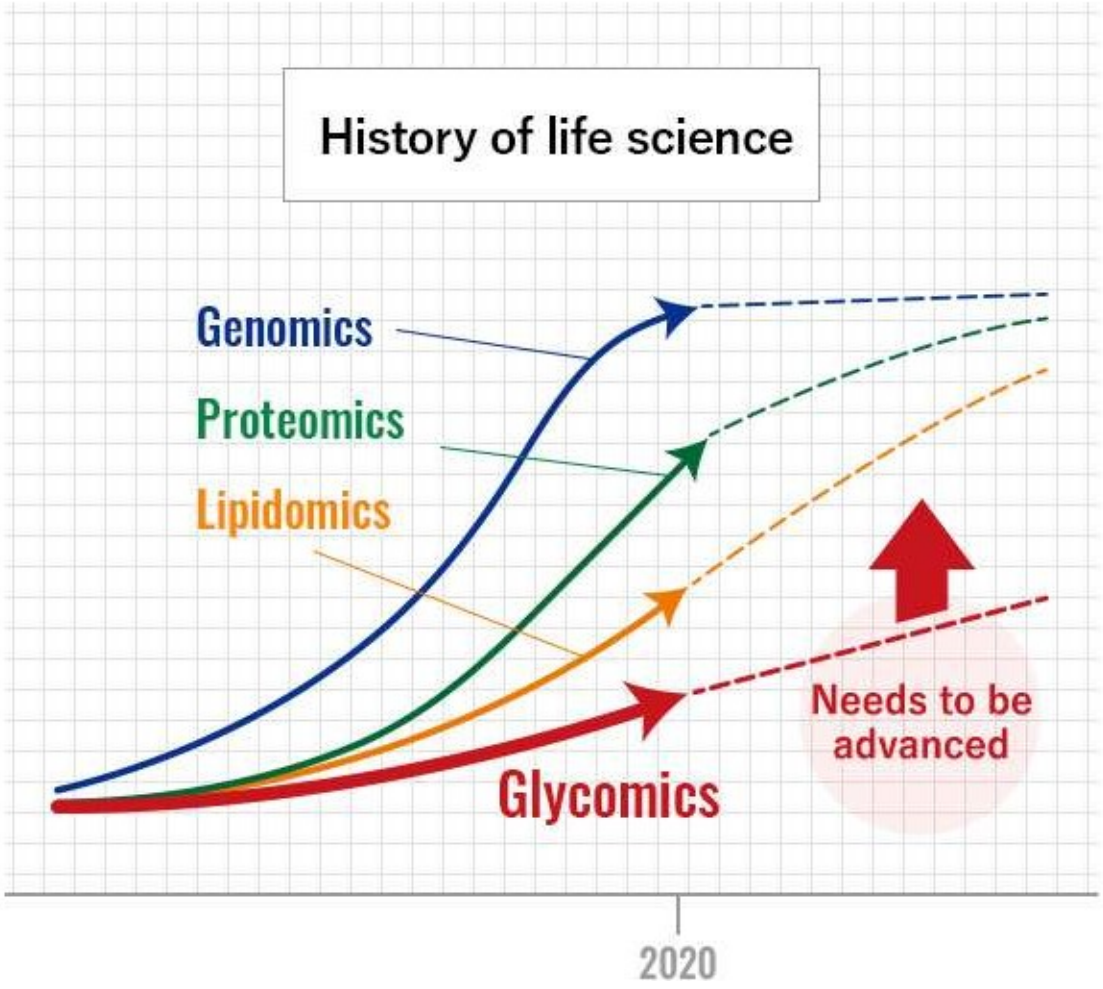


Emergent Glycan Applications





GlycoSciences are struggling to develop: Advanced Training is Pressing

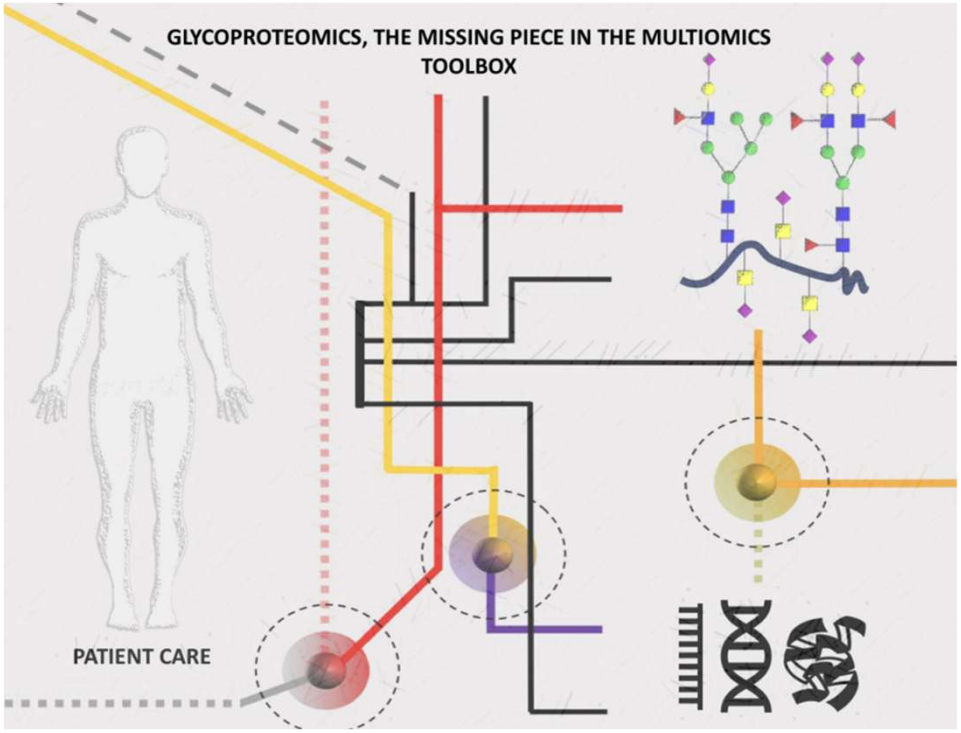


- ❑ Emerging Technologies
- ❑ Lack of knowledge in the medical community
- ❑ Few reference centers
- ❑ Few training opportunities/most are highly specialized for more educated audiences
- ❑ Glycans are not sufficiently explored in undergraduate/graduate courses

Workshop Objectives:

- **Awareness** to the relevance of glycans for biomedical sciences
- **Training** on Glycan-Related Diagnostics, Therapeutic Developments, and Research Methodologies for a Broad Audience of Non-Specialists
- **Empower** researchers and other professionals to introduce and explore glycan-related dimensions

Comprehensive Integration of Multilayers of Biological Data is Key to Address Complex Biomedical Challenges



Capacitate participants to…

i) **Recognize and detect glycans and glycoconjugates** (glycolipids, glycoproteins) markers that are crucial for the detection of diseases;

ii) **Innovate in vaccine and target therapy creation**, including new cancer immunotherapies and other treatments for challenging communicable and non-communicable diseases;

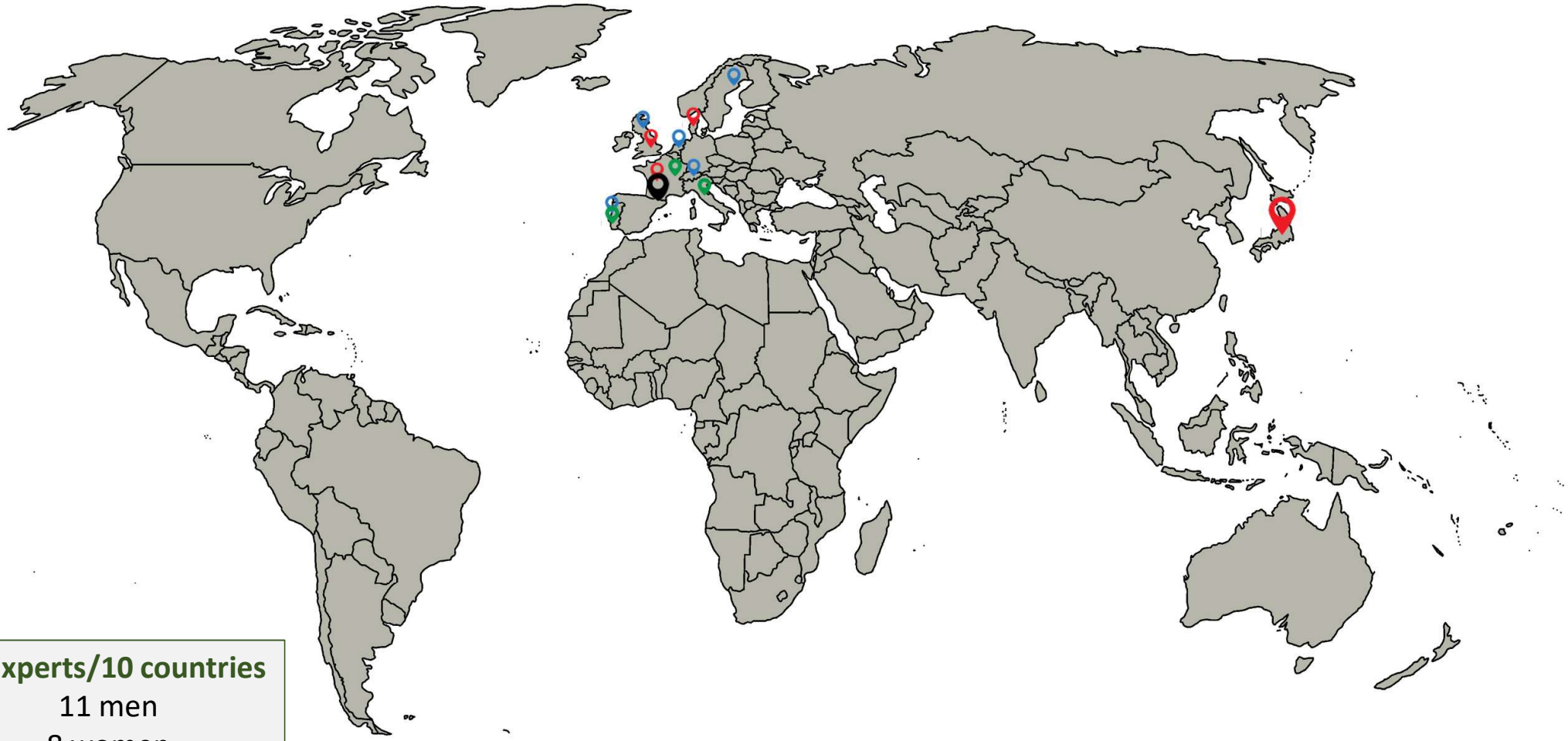
iii) Investigate at gene and protein levels defects in **glycosylation enzymes dysregulated in pathologies**;

iv) Study the **structure-function relations of microorganisms' glycans** involved in pathogenicity;

v) Identify and implement **cutting-edge tools and methodologies** for the characterization and exploration of glycan functions in health and disease;

Target Audience

Researchers and **technical staff** in the field of biomedical science from **academia** (infectiology, immunology, cancer research, genetic diseases, metabolic diseases) and **private** sector (pharmacology, therapeutics, diagnosis, cosmetics); **PhD students; post-doctorates**. **Entry levels in glycobiology are welcome**


19 Experts/10 countries
11 men
8 women
Fundamentals of Glycobiology
Translational Glycobiology
Role of Glycans in Human Pathologies
Glyco-analytics

Inserm Workshop

Glycobiologie - Structures et fonctions des glycanes dans les pathologies humaines

Glycobiology - Structures and functions of glycans in human pathologies

12-15 Nov 2025/12th-15th Nov 2025 ◘ Bordeaux, France

DAY 1: Fundamentals of Glycobiology

15:30 - 16:00	**Reception of participants**
16:00 - 16:15	Welcome and presentation by the organizers
SESSION I	**Fundamentals of Glycobiology: Structure, Biosynthesis, Functions of Glycans**
16:15 - 17:00	Glycan Diversity and Functions **Yann Guerardel (CNRS, Université de Lille, Lille, France) & Sandrine Gulberti (University of Lorraine, Nancy, France)**
17:00 - 17:30	**Coffee break**
17:30 - 18:15	Biosynthesis of Glycans **Yann Guerardel (CNRS, Université de Lille, Lille, France) & Catherine Bui (University of Lorraine, Nancy, France)**
18:15 - 19:00	Principles of Glycan Recognition **Anne Imberty (CERMAV, Grenoble, France)**
19:30	**Dinner**

DAY 2 (Part I) : Roles of Glycans in Human Pathologies

Jeudi 13 Novembre 2025 ◘ Thursday 13th November 2025

06:30 - 08:30	**Breakfast**
SESSION II	**Roles of Glycans in Human Pathologies**
08:30 - 09:15	Glycans in Bacterial and Viral Infections **Cristina De Castro (Naples, Italy)**
09:15 - 10:00	Glycans in Parasitic Infections **Thierry Fontaine (Institut Pasteur, Paris, France)**
10:00 - 10:30	**Coffee break**
10:30 - 11:15	Genetic and Congenital Disorders of Glycosylation **François Foulquier (CNRS, Université de Lille, Lille, France)**
11:15 - 12:00	Glycans in Inflammation and Cancer
	José Alexandre Ferreira (IPO-Porto, Porto, Portugal) & Salomé Pinho (i3S-University of Porto, Porto, Portugal)
12:00 - 14:00	**Lunch**

DAY 2 (Part II) : Translational Glycobiology

SESSION III	Translational Glycobiology
14:00 - 14:45	Glycans as Clinical Biomarkers **Fredrik Noborn (University of Gothenburg, Gothenburg, Sweden)**
14:45 - 15:30	Glycan targeting Molecules for Precise Cancer Therapy **Heinz Läubli (University of Basel, Basel, Switzerland)**
15:30 - 16:00	**Coffee Break**
16:00 - 16:30	Glycan-based Vaccines for Infectious Diseases and Cancer **Yvette van Kooyk (Amsterdam UMC, Amsterdam, The Netherlands)**
16:30 - 17:00	Emergent Glycan-based Therapies for Cancer **Celso Reis (i3S, University of Porto, Porto, Portugal)**
17:00 - 17:30	Novel Drugs from complex Sugars **Jeremy Turnbull (Keele University, Staffordshire, United Kingdom)**
17:30 - 18:00	Application of High Throughput Glycomics Towards Biomarkers Discovery **Manfred Wuhrer (Leiden University, Leiden, The Netherlands)**
19:30 - 20:15	**Panel discussions and Cocktail**
20:15	**Dinner**

Panel Discussions for Cross-Fertilization in Glycosciences

Organized discussions led by a panel of experts for exchange of ideas, knowledge, and techniques between different disciplines or areas of expertise. This interdisciplinary approach aims to **foster innovation and new insights** in glycosciences by combining diverse perspectives and methodologies.

Three main Topics (to be surveyed upon registration):

- ❖ Roles of Glycans in Human Pathologies;
- ❖ Translational Glycobiology;
- ❖ How to approach the study of glycans.

OBJECTIVE:

Encourage collaboration and the sharing of ideas among scientists from various disciplines within glycosciences. Spur innovation and advance the field through interdisciplinary cooperation.

DAY 3: How should we approach the study of glycans

Vendredi 14 Novembre 2025 ◘ Friday 14th November 2025

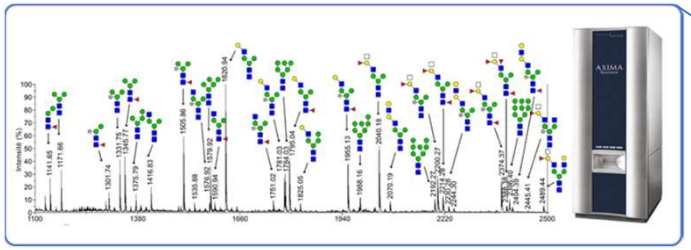
06:30 - 08:30	**Breakfast**
SESSION IV	**How should we approach the study of glycans?**
08:30 - 09:15	Reading and Writing the Human Glycocode using Genetic Tools **Hans Wandall (Copenhagen Center for Glycomics, Copenhagen, Denmark)**
09:15 - 10:00	Functional Glycoproteomics Towards Precision Medicine **Muriel Bardor (University of Rouen, Rouen, France)**
10:00 - 10:30	**Coffee Break**
10:30 - 11:15	Bioorthogonal Precision Tools to address the Human Glycoproteome **Ben Schumann (Imperial College, London, United Kingdom)**
11:15 - 12:00	Bioinformatics for Glycosciences **Kiyoko Aoki-Kinoshita (Soka University, Tokyo, Japan)**
12:00 - 12:15	**Concluding remarks**
12:00 - 14:00	**Lunch**
14:00	**Departure**

PRACTICAL PART – 20 selected participants

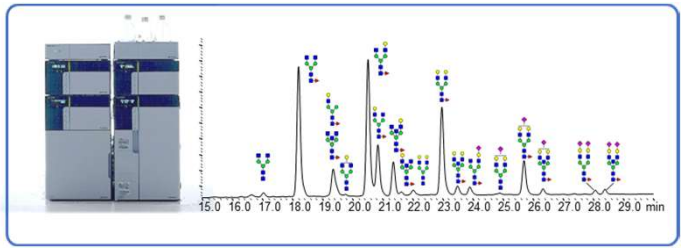
AIM: Correlate changes in **patients' glycosylation profiles** with different pathologies to better understand **the causative agents** and the **pathophysiological processes** involved.

ugsf
Unité de Glycobiologie Structurale et Fonctionnelle

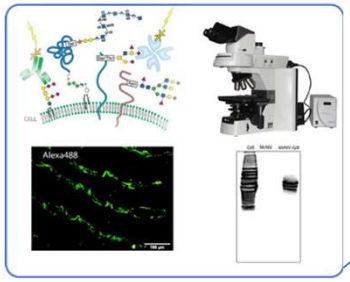
PAGés-P3M platform



Mass Spectrometry



HPLC



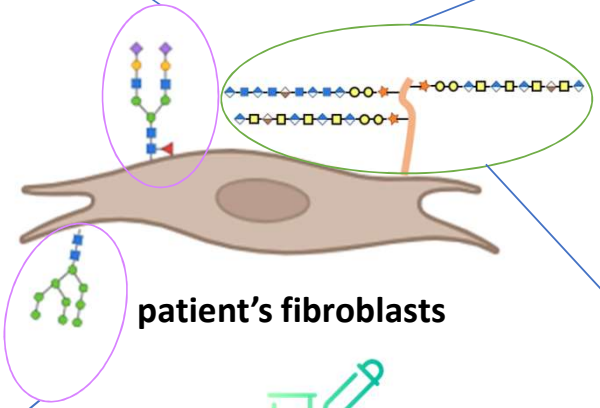
Fluorescence Microscopy

Glycan epitopes

Glycan composition

Lille

Nancy



patient's fibroblasts

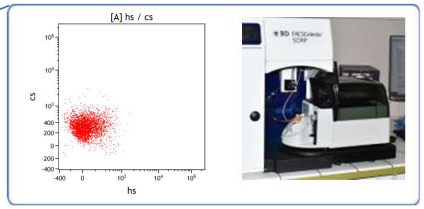
biological fluids/ tissues

GAG profiling

HTP screening

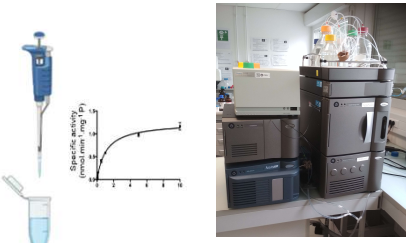
IMoPA
Ingénierie moléculaire, cellulaire & physiopathologie

AGAPPsi platform



Flow Cytometry

Luminometer



UPLC

COMMUNICATION PLAN

WORKSHOP IN GLYCOBIOLOGY – STRUCTURES AND FUNCTIONS OF GLYCANS IN HUMAN PATHOLOGIES

- Institution's website
- Social networks
- Scientific networks
- Speakers as Ambassadors
- Communication services of universities

IMoPA Ingénierie moléculaire, cellulaire & physiopathologie
www.imopa.cnrs.fr

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ugsf Unité de Glycobiologie Structurale et Fonctionnelle
https://ugsf.univ-lille.fr/

GLYCOTwinning Building Networks to Excel in Glycoscience

Groupe Français des Glycosciences

GlycoEst

Glyco@Alps Université Grenoble Alpes

cnrs GDR Groupement de recherche ChemBio Chémobiologie

BPTM BACTERIAL POST-TRANSLATIONAL MODIFICATIONS

cnrs

Université de Lille

UNIVERSITÉ DE LORRAINE

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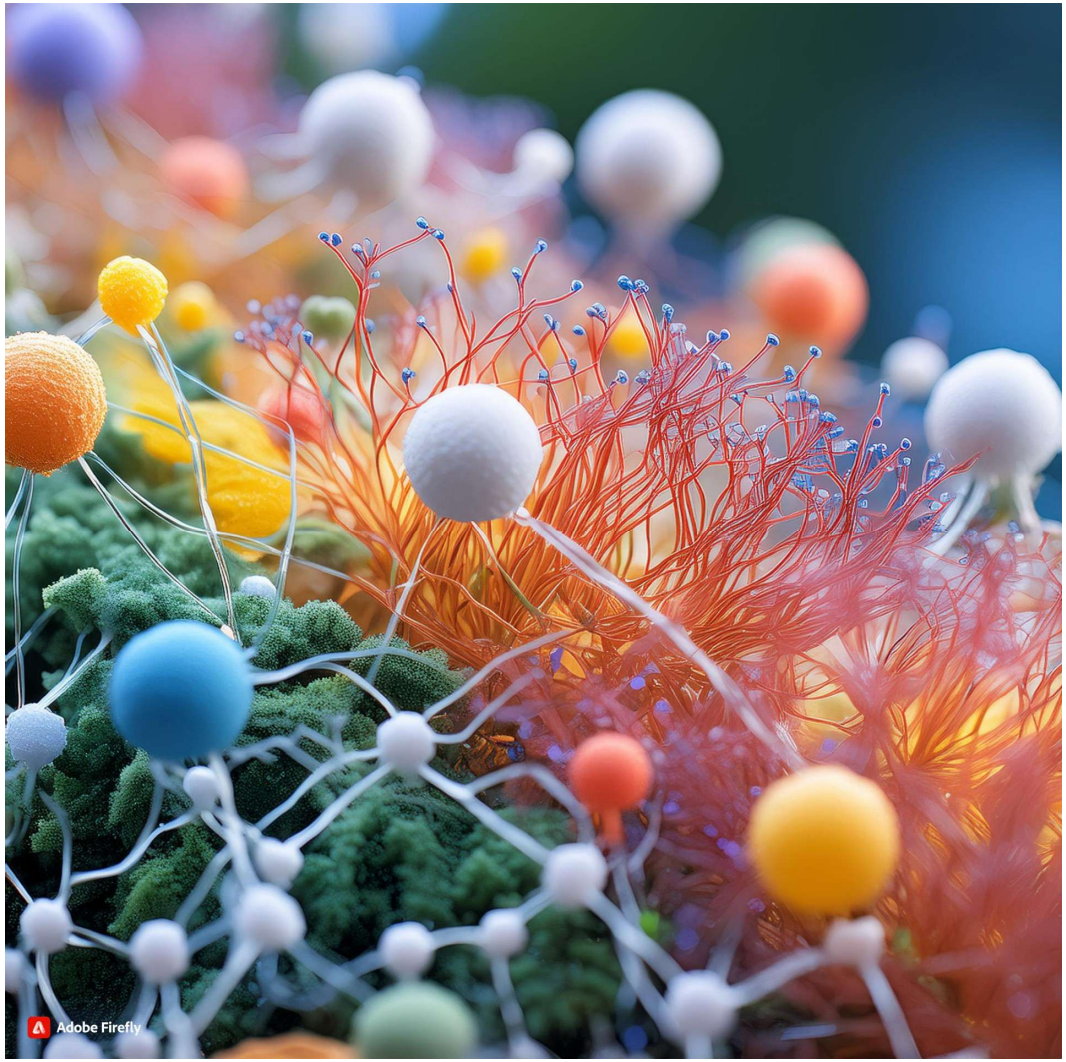
factuel l'info de l'université de lorraine



WORKSHOP IN GLYCOBIOLOGY – STRUCTURES AND FUNCTIONS OF GLYCANS IN HUMAN PATHOLOGIES