Workshop: Systems Glycobiology — From Pathway Models to Predictive Tools

Date: Day 1 (Pre-meeting), SFG 2025
Duration: 1 hour (1 pm – 2 pm, November 9)
Format: In-person (lectures + tutorials)

Overview

This workshop will explore the question: "How do we learn and what do we learn when we integrate individual glycosylation reaction steps into biosynthesis networks?". The session will introduce foundational and cutting-edge topics in Systems Glycobiology, focusing on computational modeling and systems-level understanding of glycosylation pathways and networks.

The workshop targets graduate students, postdocs, and researchers including those with limited prior experience in computational modeling. We propose to offer accessible tutorials and practical examples. The session is especially relevant to the changing times, as glycoscience knowledge is increasingly data-driven, with mechanistic modeling informing cell behavior and disease progression.

Participants will gain both conceptual grounding and hands-on exposure to glycoinformatics tools and modeling strategies, with a focus on real biological and biomedical applications.

Time	**Session**
1:00–1:10	Opening & Tutorial 1 (Update and Use of GlycoMaple: Morihisa Fujita)
1:10–1:20	Lecture & Tutorial 2 (Towards more powerful and interpretable AI with GlyCompare: Benjamin Kellman)
1:20–1:30	Lecture & Tutorial 3 (Modelling to link Golgi-enzyme organisation to glycan distribution: Daniel Ungar)
1:30–1:50	Lecture (A Systems View of Glycosylation using Flux Analysis: Rudiyanto Gunawan)
1:50–2:00	Discussion & Closing (Sriram Neelamegham)

Organizers

Dr. Morihisa Fujita, Gifu University – Glycan biosynthesis & predictive tools
Dr. Sriram Neelamegham, University at Buffalo – Quantitative glycobiology & network analysis
Dr. Nathan E. Lewis, University of Georgia – Systems biology & omics integration