Opportunities and challenges in large international initiatives to analyze the human glycome

- SFG 2025 Workshop -

Chairs: Gordan Lauc & Tetsuya Okajima

Workshop Summary:

The study of the glycome, known as glycomics, seeks to elucidate the structure, biosynthesis, and functions of glycans, offering profound insights into human health and disease. Given their complexity, dynamic nature, and substantial inter-individual variability, understanding the human glycome is essential for advancing diagnostics, therapeutics, and personalized medicine. The structural diversity of glycans, arising from varied monosaccharide compositions, linkages, and branching patterns, poses significant analytical challenges but also opportunities in biomarker discovery, therapeutic development, and our understanding of complex biological systems. Continued advancements in glycomic technologies and interdisciplinary collaborations will further unlock the potential of the glycome, paving the way for transformative medical applications.

Large international initiatives have generated information about >250,000 human glycomes, developed detailed maps of glycomes of different tissues, and published initial studies that merge glycomics with genomics, proteomics and metabolomics. Progress is expected to continue at an ever increasing pace, but this also brings challenges of generating high quality data. Extensive collaborative efforts are needed to standardize and validate analytical methods and other technologies used in different laboratories worldwide.

Workshop schedule:

Gordan Lauc, Genos Glycoscience Research Laboratory, Zagreb, Croatia
The Human Glycome Project – What did we learn from the first 250,000 glycomes

Rick Cummings, Harvard Medical School, Boston, USA
Mammalian Glycomes – Structures and Spatial Expression

Tetsuya Okajima, Nagoya University, Japan
Comprehensive Glycan Analysis in the Human Glycome Atlas: Glycomics, Glycoproteomics, and Their Analytical Platforms