

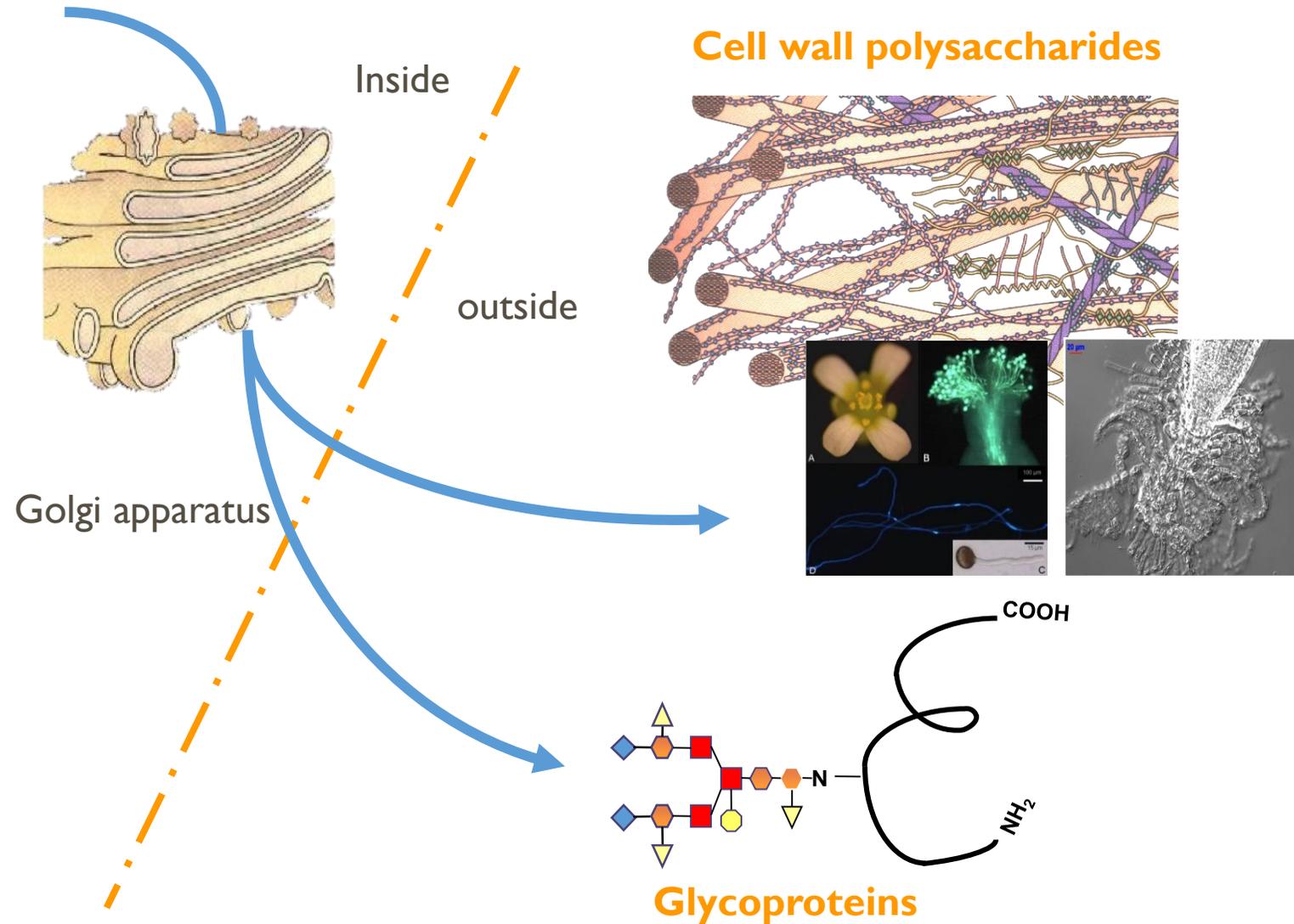


MICROALGAE as alternative cell factory for the production of monoclonal antibodies

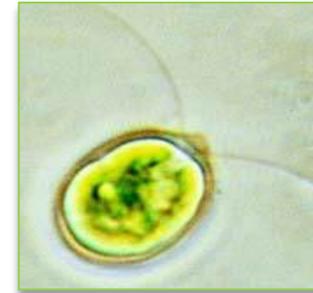
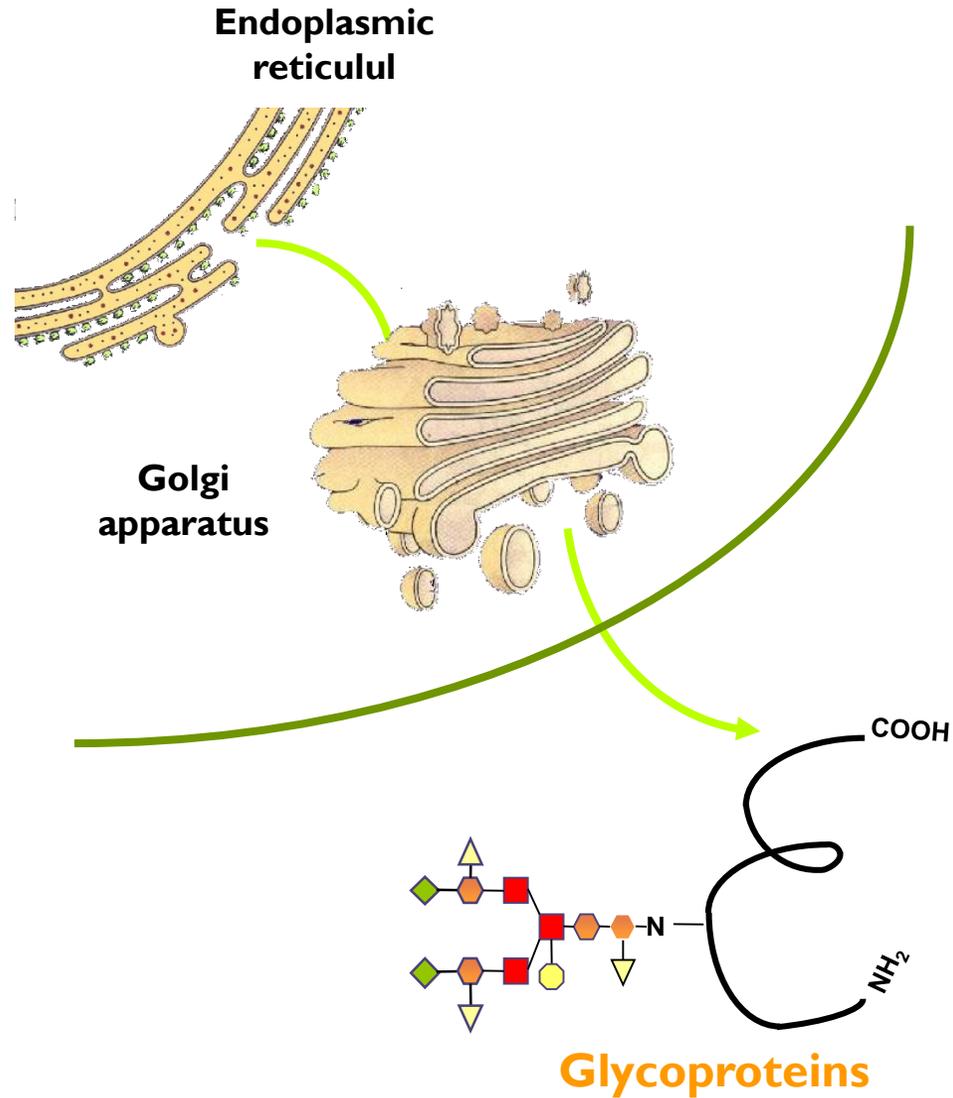
Pr Muriel Bardor,
Université de Rouen Normandie



GlycoMEV activities: Structure, biosynthesis and functional properties of plant and microalga glycoconjugates



GlycoMEV activities: Structure and biosynthesis of glycoproteins in microalgae



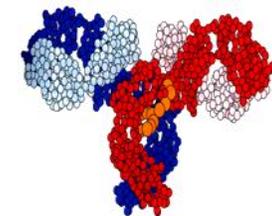
Chlamydomonas reinhardtii



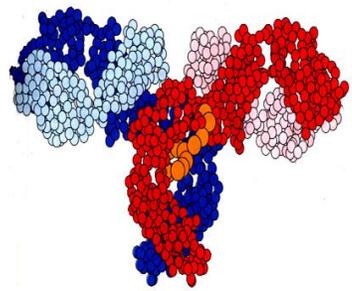
Phaeodactylum tricornutum



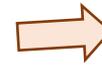
Alternative expression systems



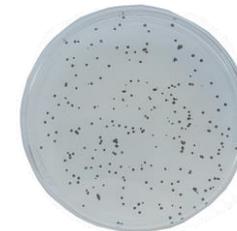
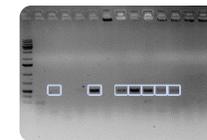
Microalgae as Protein Expression system: Phaeodactylum (PHAEO) as a cell factory



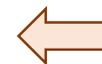
Cloning of the
genes of interest



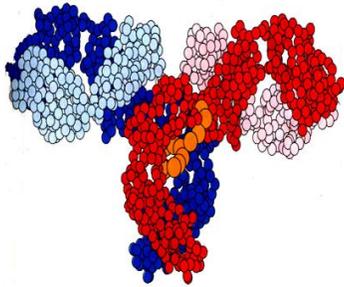
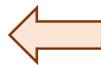
Transformation of
PHAEO cells



Selection of the best
producer clones



Accumulation in the culture
media

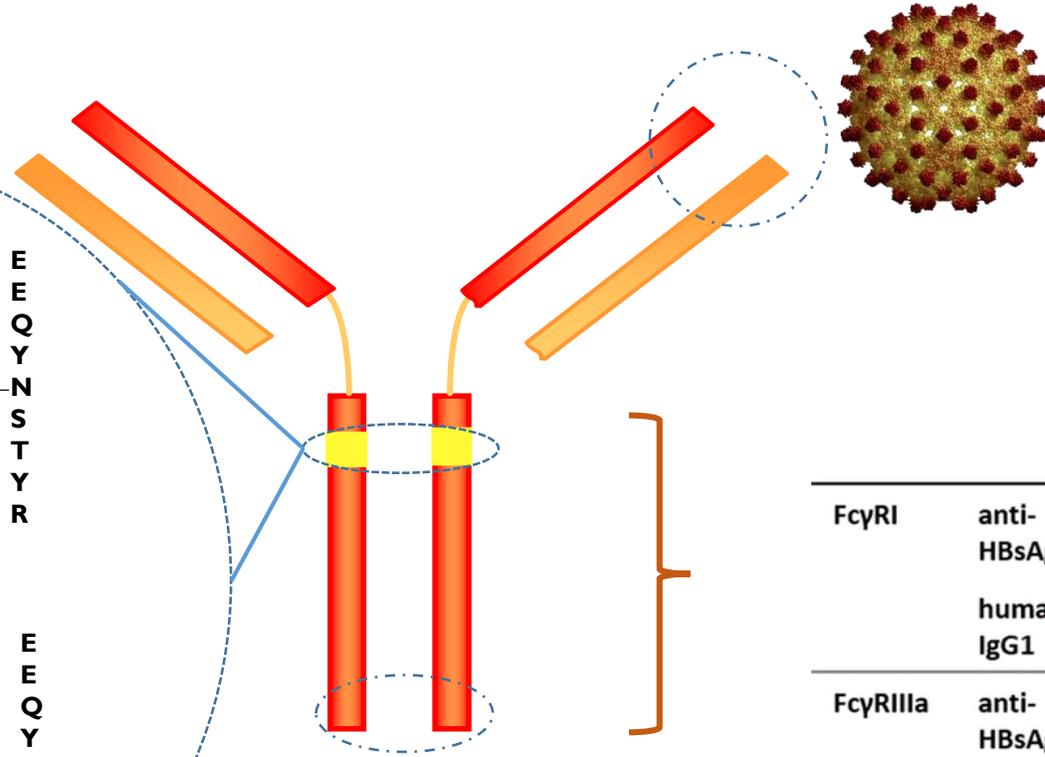
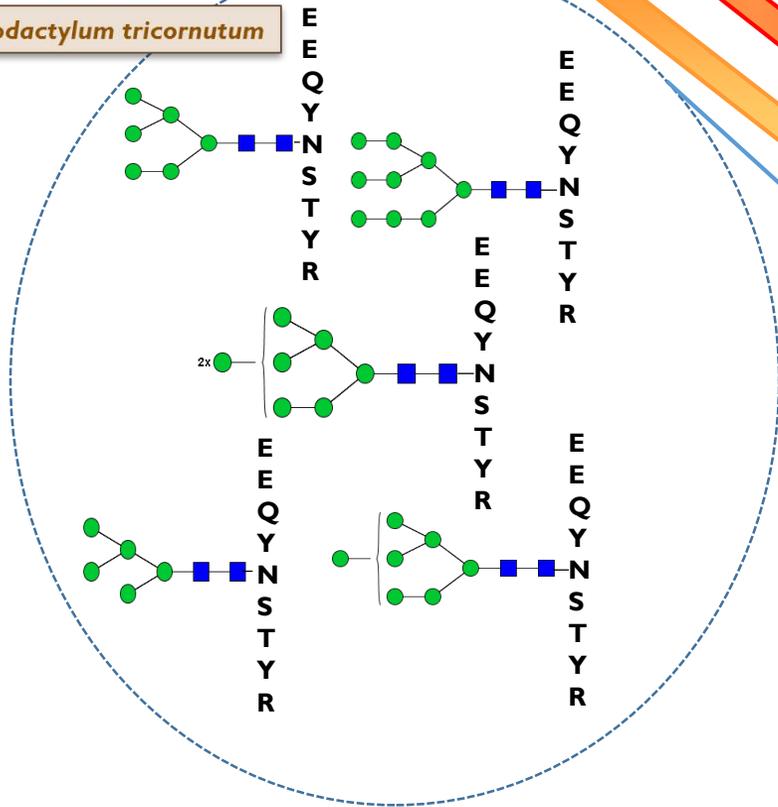


Purification and
characterization of the
PHAEO-made product

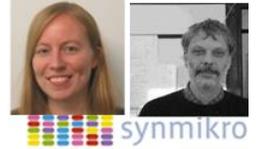
POC 1: production and characterisation of a human recombinant antibody directed against the Hepatitis B virus antigen



Phaeodactylum tricornutum



		K_D
FcyRI	anti-HBsAg	330 ± 20 pM
	human IgG1	73 ± 12 pM
FcyRIIIa	anti-HBsAg	182 ± 11 nM
	human IgG1	542 ± 13 nM



Zentrum für Synthetische Mikrobiologie



St George's University of London

PhaeomAbs: towards increasing the production yield of mAbs in PHAEO



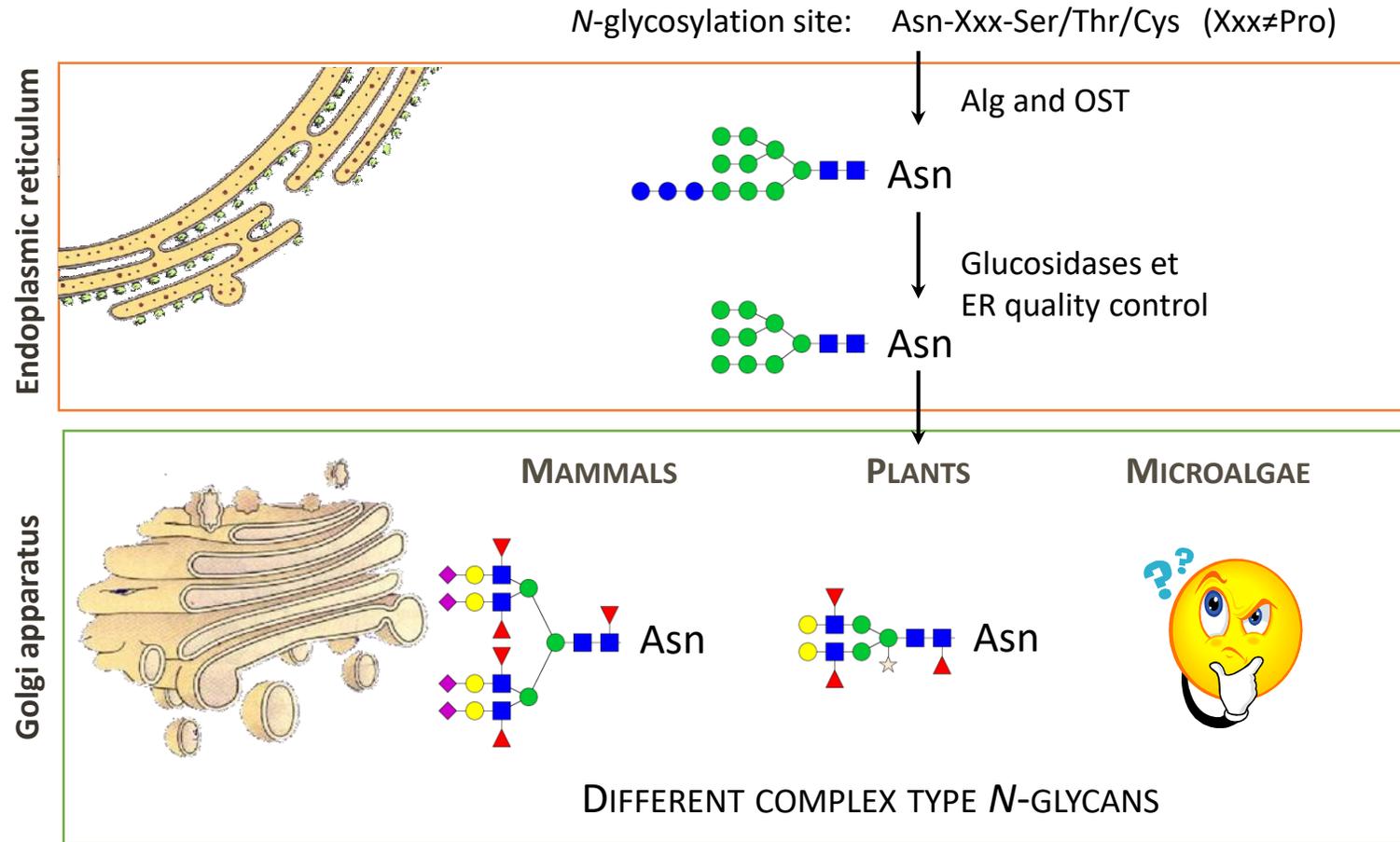
PIA Grand défi « biomédicament : améliorer les rendements et maîtriser les coûts de production »

- AAP 2020 BiopNSE – Nouveaux Systèmes d'Expression -



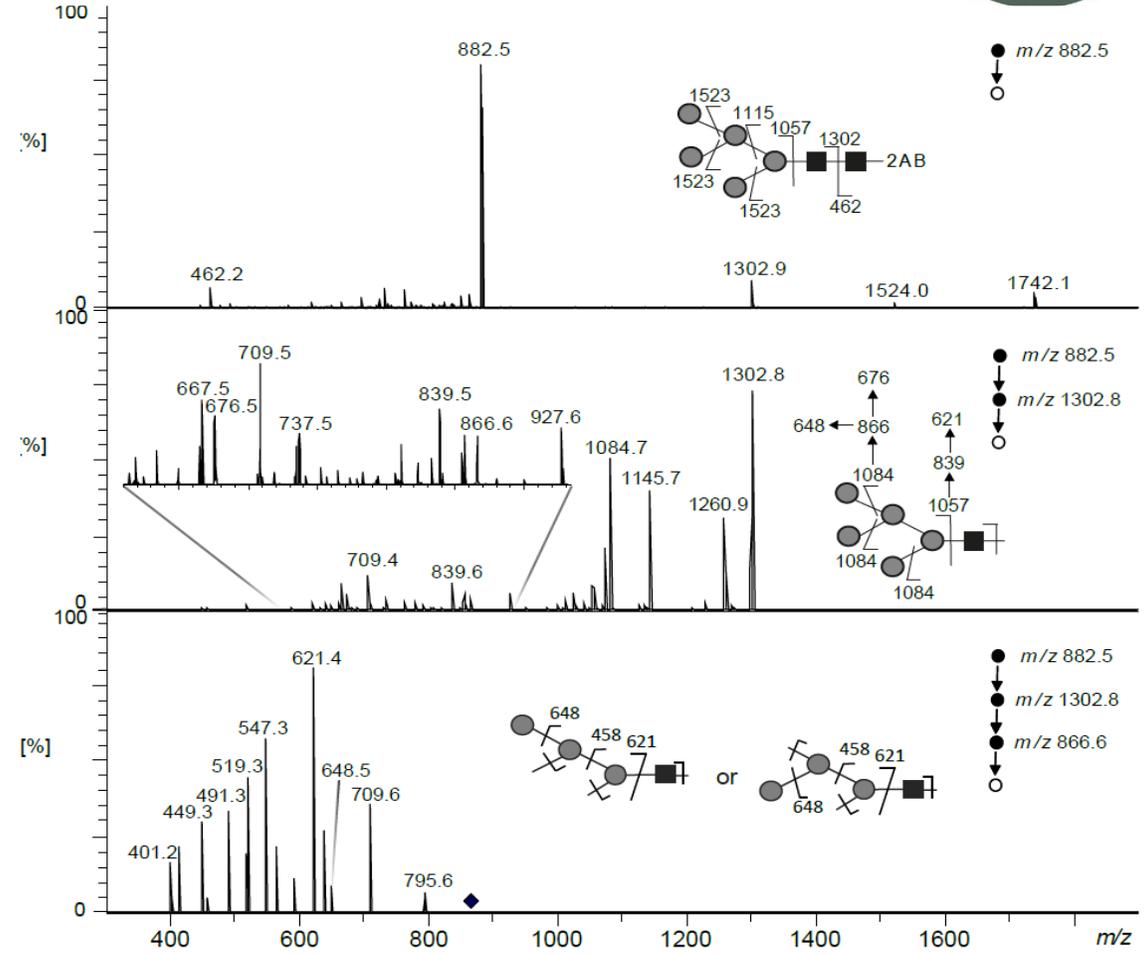
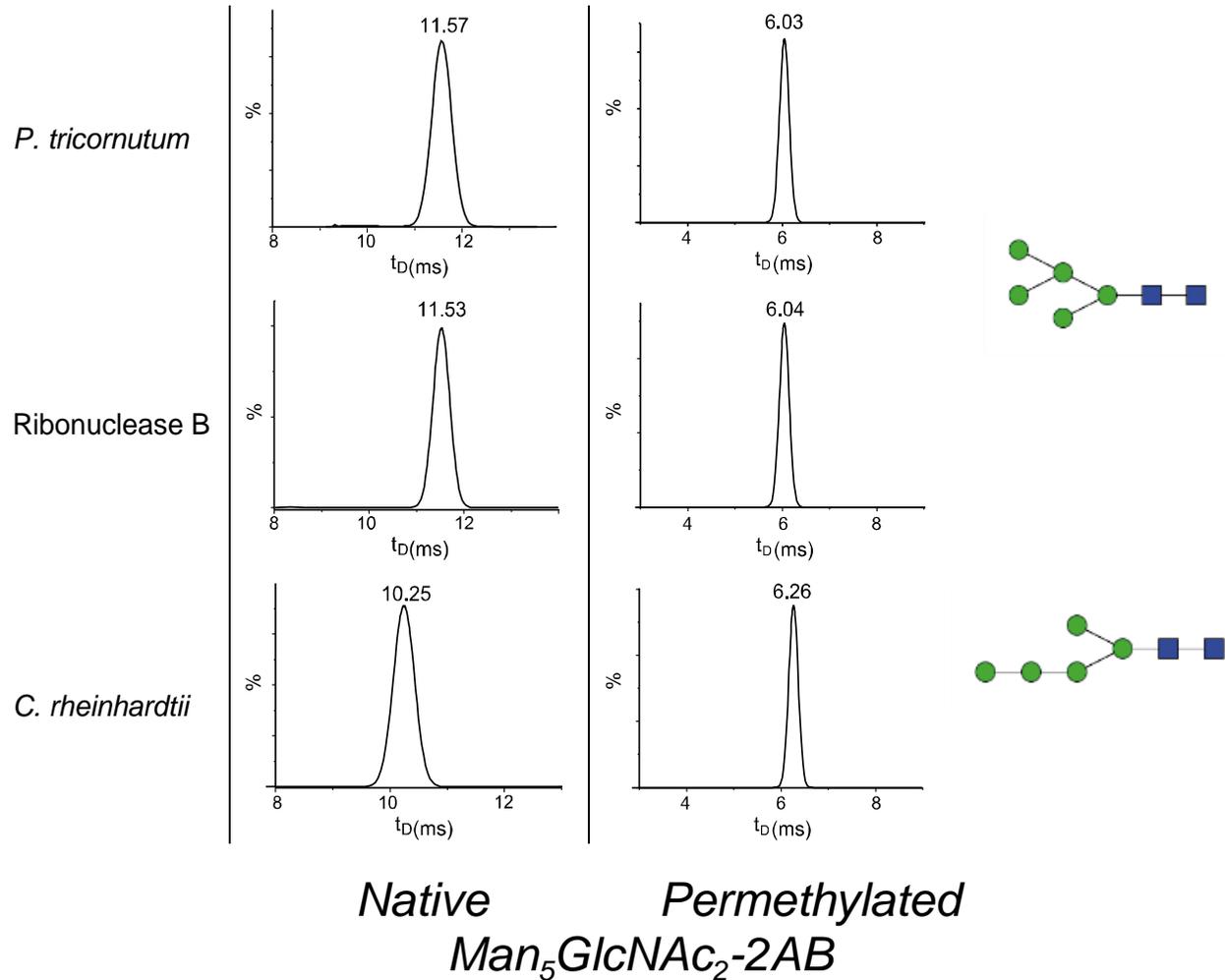
- 1) Better control the GOI insertion and expression
- 2) Scale up of the bioprocess
- 3) Increase the mAbs secretion
- 4) Evaluate the impact of protease activities

Towards understanding the *N*-glycosylation in microalgae

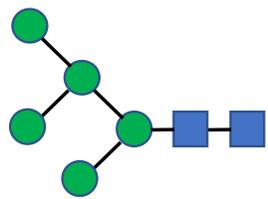


■ *N*-Acetylglucosamine ● Glucose ● Mannose ● Galactose ▲ Fucose ◆ Sialic acid ☆ Xylose

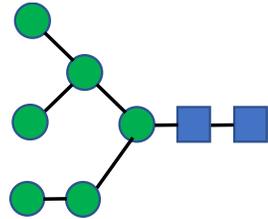
N-glycosylation of proteins produced by PHAEO: analysis through IMS-MS and ESI-MSn



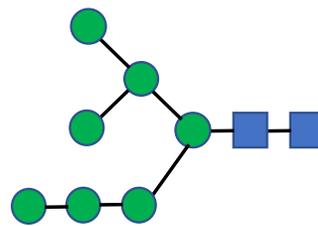
PHAEO is producing oligomannosides N-glycans identical to the ones synthesized by mammalian cells



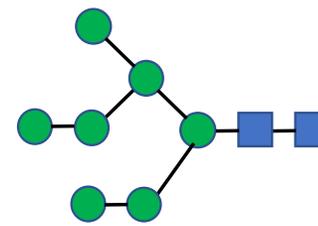
Man-5



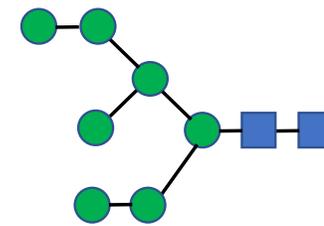
Man-6



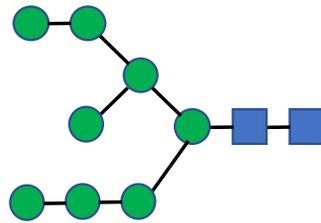
Man-7A



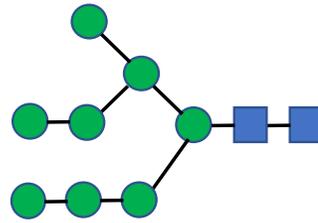
Man-7B



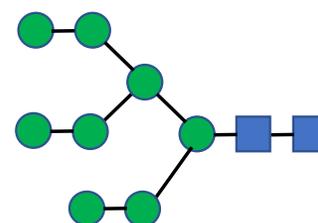
Man-7C



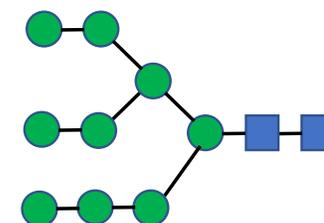
Man-8A



Man-8B



Man-8C

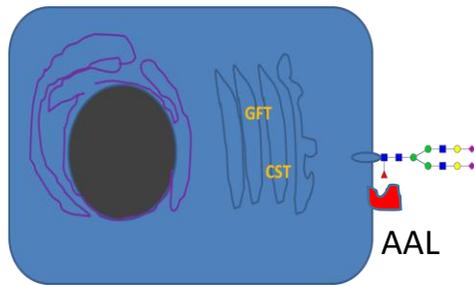


Man-9

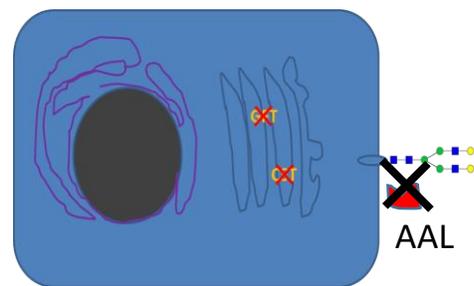
Characterization of the first nucleotide sugar transporter from microalgae: Pt GDP-Fucose transporter



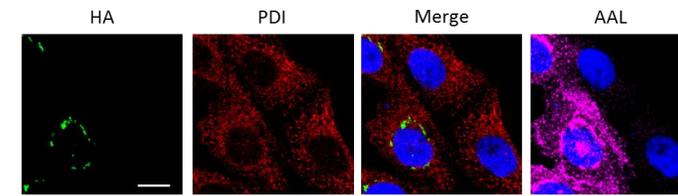
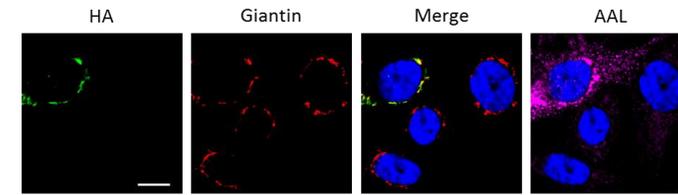
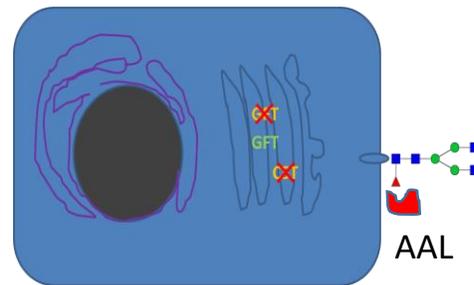
Wild-type CHO



CHO-*gmt5*

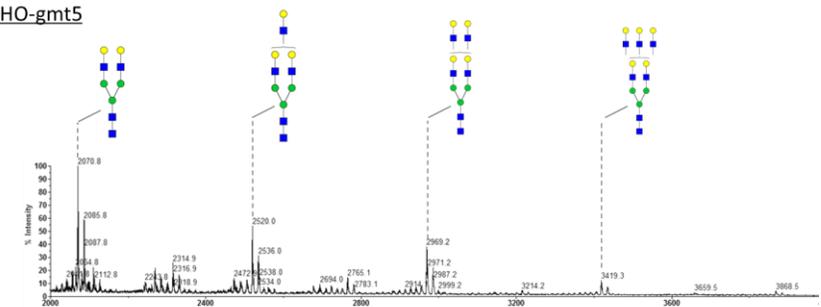


HA-tag Phaeo "GFT"

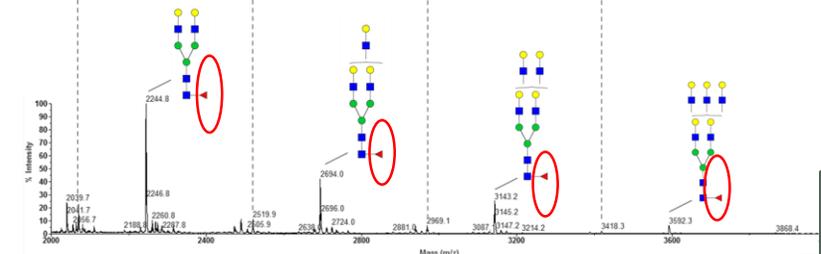


Bar: 10 μm

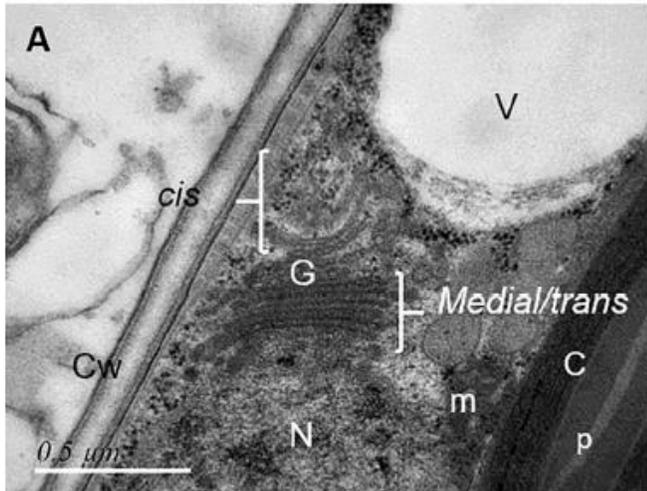
CHO-*gmt5*



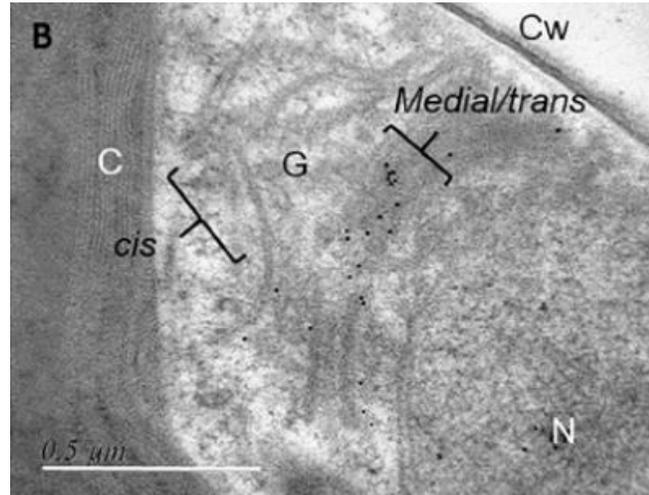
CHO-*gmt5* + Phaeo "GFT"



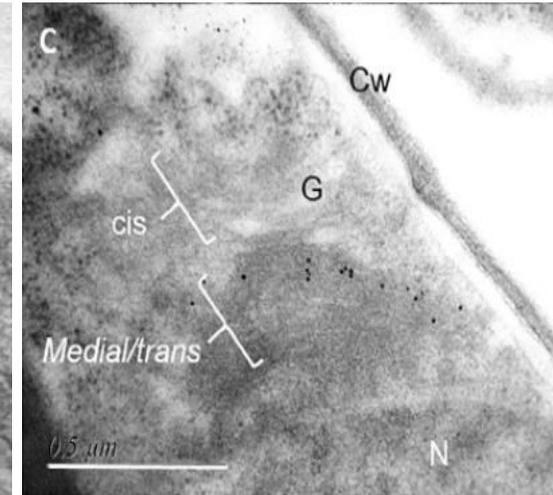
Cartography of the Glycosyltransferases in PHAEO Golgi apparatus by Transmission Electron Microscopy



Pt cells overexpressing a tagged version of GnT I



Pt cells overexpressing a tagged version of FucT I





alga
biologics