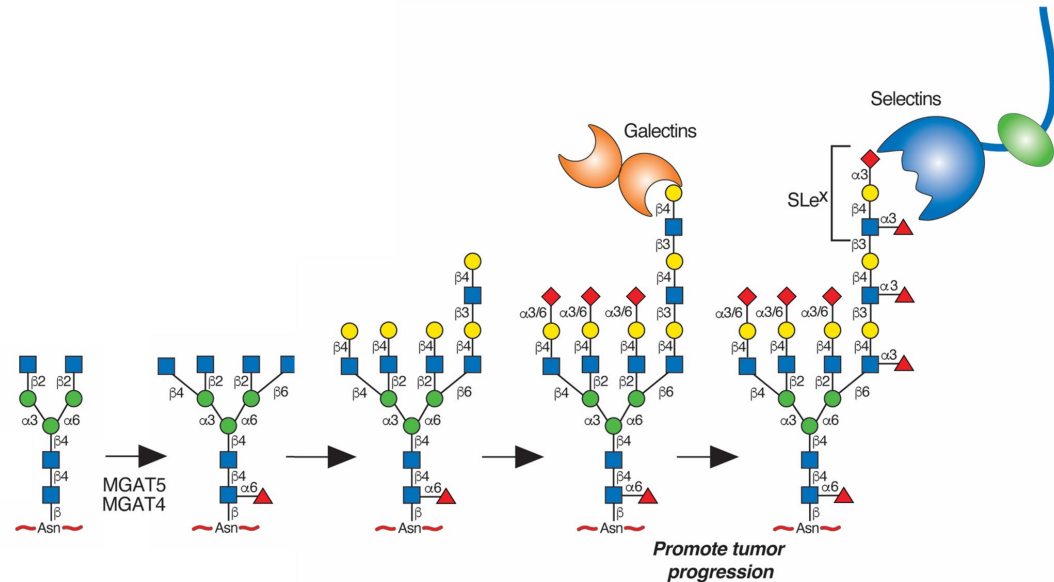


Brief description:

Protein glycosylation is a widespread eukaryotic post-translational modification in extracellular and membrane anchored proteins. Protein glycosylation pathways are frequently altered in cancer cells, resulting in aberrant glycan structures that are well-known **tumoral markers**. Preventing the formation of such abnormal glycans has been reported to diminish tumor progression.



One of such aberrant glycan structures is the formation of **highly branched** structures. These are the result of enhanced expression of MGAT4 and MGAT5 genes by oncogenic transcription factors. Cells with increased MGAT5 expression show increased frequency of metastasis, whereas cells lacking this gene lose the metastatic phenotype. Therapeutic strategies aimed at preventing the formation of such branched glycans have been attempted and are under current research efforts.

Objective:

The student will join the following research topic:

1- EXPRESSION AND CHARACTERIZATION OF A GLYCOSYL HYDROLASE THAT SPECIFICALLY HYDROLYSES BRANCHED GLYCANS.

In this master thesis project, you will recombinantly express a selection of enzymes that potentially cleave the glycosidic bonds present in highly branched glycans. Previous bioinformatics analysis of the carbohydrate active enzymes database (CAZY) has identified a list of gene candidates with enzymatic activities close to the desired one. You will clone, express, purify and characterize the enzymatic activities of a short selection of genes from this list. The outcome of your investigations will be the characterization of a lead glycoside hydrolase that potentially targets aberrant glycans in tumor cells. This lead enzyme can further be optimized by protein engineering and/or assessed for functionality in cellular studies.

Technical skills: Molecular biology, recombinant protein expression and purification, enzymatic characterization. *More information at:*

<https://planaslab.iqs.edu/research/>

Director(s) IQS: Dra. Magda Faijes (magda.faijes@iqs.url.edu), Dr. Xevi Biarnés (xevi.biarnes@iqs.url.edu)