

Plant Sphingolipid Glycosylation And Its Role In Immunity And Cell Wall Organization

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Project Goals: Short statement of goals. (Limit to 1000 characters)

Glycosylinositol phosphorylceramides (GIPCs) are a class of glycosylated sphingolipids found in plants, fungi and protozoa. They are extremely abundant in the plant plasma membrane, estimated to form ~25-40 % of total lipids, but almost nothing is known about their function. GIPCs consist of a ceramide attached to a glycan headgroup via a phosphate group. Recently we have identified the first three Arabidopsis proteins involved in the headgroup biosynthesis - IPUT1 (a UDP-glucuronic acid glycosyltransferase), GONST1 (a GDP-mannose transporter) and GMT1 (a GDP-mannose glycosyltransferase). Plants lacking functional copies of these proteins are either pollen lethal (*iput1*) or have extreme developmental defects (*gonst*, *gmt1*), despite the lipid portion of the GIPC being unaffected. This implies a critical function for the GIPC glycan headgroup in membrane function. Here, we identify a new Golgi-localized protein involved in GIPC headgroup biosynthesis in both Arabidopsis and rice - GINT1 (GLUCOSAMINE INOSITOLPHOSPHORYLCERAMIDE TRANSFERASE1), and have described its role. We are now using our collection of GIPC biosynthetic genes as a toolbox with which to explore GIPC function. Two examples will be presented.

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