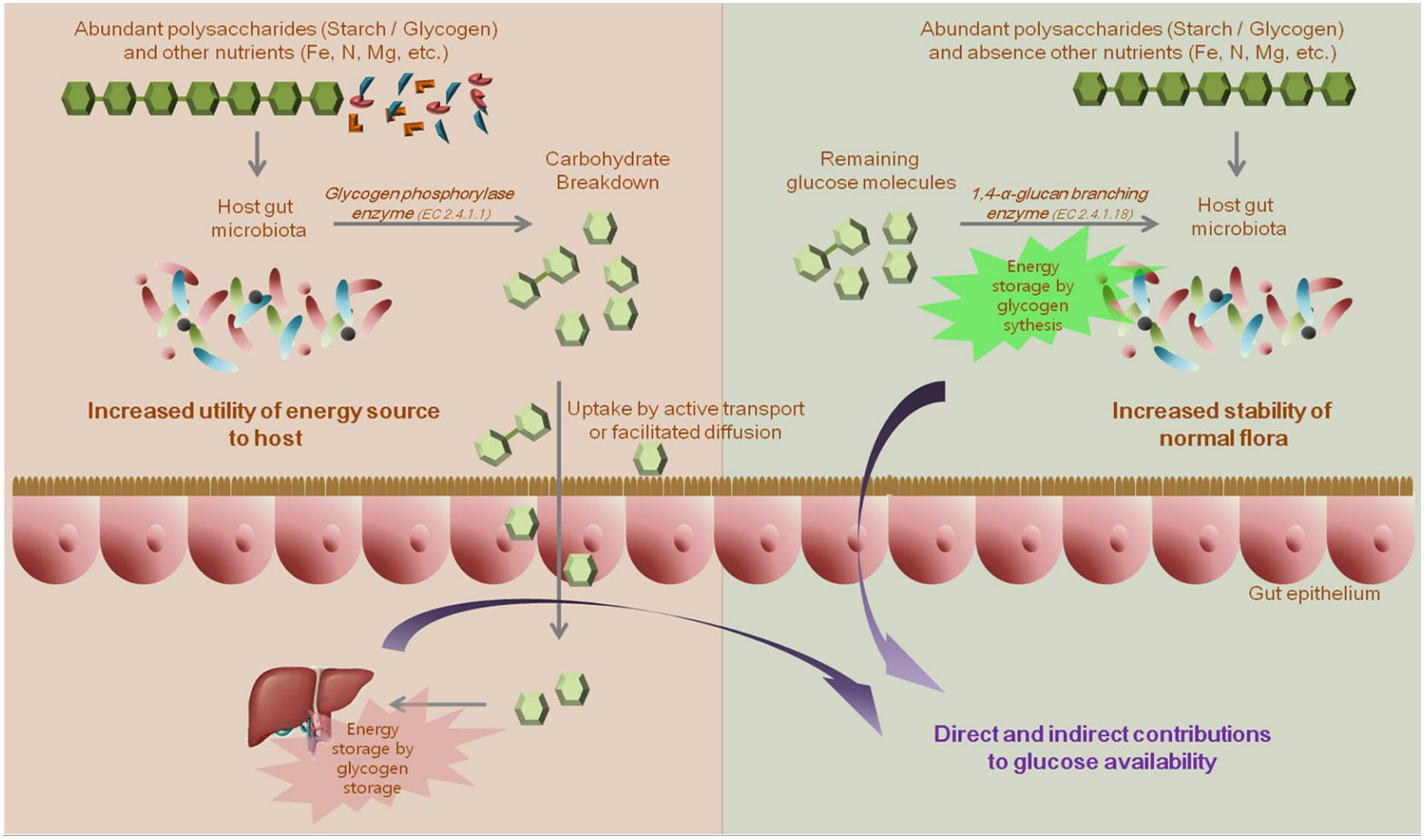

Supplementary Figure S6. Schematic of glycogen degradation and biosynthesis by two different types of enzymes.

To achieve glycogen degradation, the host gut microbiota break down carbohydrates using glycogen phosphorylase enzymes in the presence of abundant

polysaccharides (starch, glycogen) and other nutrients (Fe, N, Mg, *etc*.). Glucose is transported across the gut epithelium by active transport or facilitated diffusion. Glucose is stored as glycogen synthesized by the liver or muscle, thereby increasing the energy sources of the host. To biosynthesize glycogen, the host gut microbiota use a 1,4-alpha-glucan branching enzyme in the presence of abundant polysaccharides and the absence of other nutrients, leading to an increase in the density of the stable and viable normal gut flora. These two mechanisms may control host glucose levels either directly or indirectly.