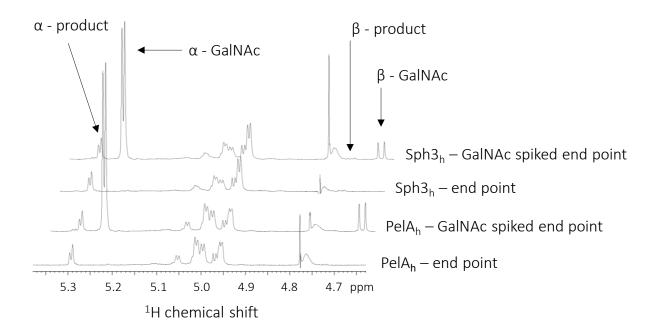


**Supplemental Figure 1.** 2D COSY  $^{1}$ H- $^{1}$ H spectra of the products released by (**A**) Sph3<sub>h</sub> and (**B**) PelA<sub>h</sub> treatment of  $\alpha$ -1,4-GalNAc octamers, observed between 1.2 and 5.5ppm in each dimension. The areas containing the signals of the anomeric protons were magnified in the right panels with an arrow indicating the chemical shift of the  $\beta$  anomer signal.



Supplemental figure 2. Sph3<sub>h</sub> and PelA<sub>h</sub> do not release monosaccharides upon degradation. NMR spectra of the products of Sph3<sub>h</sub> and PelA<sub>h</sub> digestion of  $\alpha$ -1,4-GalNAc octamers with, and without, the addition of GalNAc to the final reaction products.