

Description of Additional Supplementary Files:

Supplementary Dataset 1: 18S rDNA read counts of the Helgoland spring phytoplankton bloom from March to May 2020. Read counts from 3 and 10 μm fractions (Sheets 1 & 2) were summed. Relative abundances of groups of significant eukaryotes were plotted in Figure 1.

Supplementary Dataset 2: List of all isolate and MAG-encoded PUL-associated GH13s.

Supplementary Dataset 3: Proteomics of *Polaribacter* sp. Hel_I_88 grown on laminarin with samples taken at 18, 24 and 48 h

Supplementary Dataset 4: Proteomics of *Polaribacter* sp. Hel_I_88 and *Muricauda* sp. MAR_2010_75 grown on extracted polysaccharides from *Polaribacter* sp. as well as glycogen, alginate and xylan as controls.

Supplementary Data 5: Dataset for protein structure prediction of *Flavimarina*_Hel_1_48_SusD

Supplementary Data 6: Data set for protein structure prediction of *Muricauda*_MAR_2010_75_SusD