

Figure S1. Multiple sequence alignment of SeCar with characterized GH16 κ -carrageenases. The star represents amino acid conserved residues.

Figure S2. SDS-PAGE of purified SeCar. Lane M, protein marker; Lane 1, purified SeCar.

Figure S3. Chemical composition analysis and structure prediction of KSCOs. (A) HPGPC chromatogram; (B) ESI-MS analysis. DA, 3, 6-anhydro- α -1, 4 linked-D-galactose; G4, β -1, 3-D-galactose-4-sulfate; (C) the predicted structure of selenium-galactobioses.

Figure S4. TLC analysis of κ -selenocarrageenan hydrolysis products. Lane M, standard samples of carabiose, caratetraose and carahexaose; Lane 1, substrate before hydrolysis; Lane 2, substrate after hydrolysis.

Figure S5. Alpha-diversity of gut microbiota and rarefaction curves. (A) Ace index; (B) Shannon index; (C) Simpson index; and (D) rarefaction curves based on the operational taxonomic unit (OTU) level; each line represents one sample, and lines of the same color represent samples from the same group.