Electronic Supplementary Material (ESI) for Food & Function.

Supplementary materials

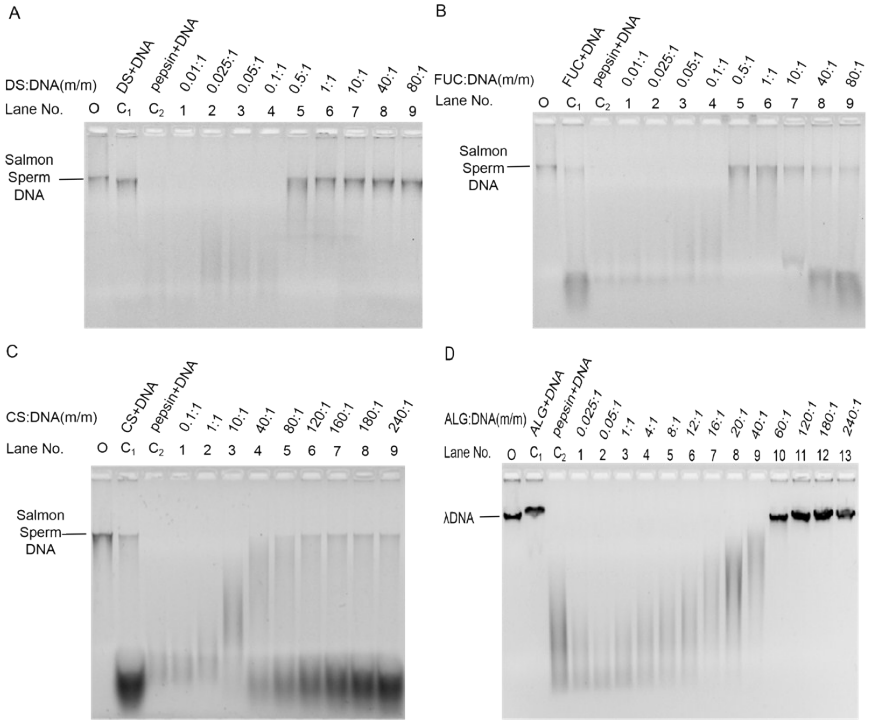

Fig. S1 Effects of DS (A), FUC (B), CS (C) and alginate (D) on the digestion of DNA by pepsin. O: Only DNA was added without polysaccharide and pepsin. C_1: Only polysaccharide (the concentration of polysaccharide corresponding to the highest mass ratio of sugar to DNA in electrophoresis) and DNA were added without pepsin. C_2: Positive control in which DNA was digested by pepsin without adding polysaccharide. The remaining lanes were a mixture of polysaccharide and DNA in a mass ratio of 0.01:1-240:1, while pepsin and DNA concentrations were 1 mg/mL and 0.03 mg/mL, respectively. The reactions were carried out at 37°C for 2 h (pH 3.8).

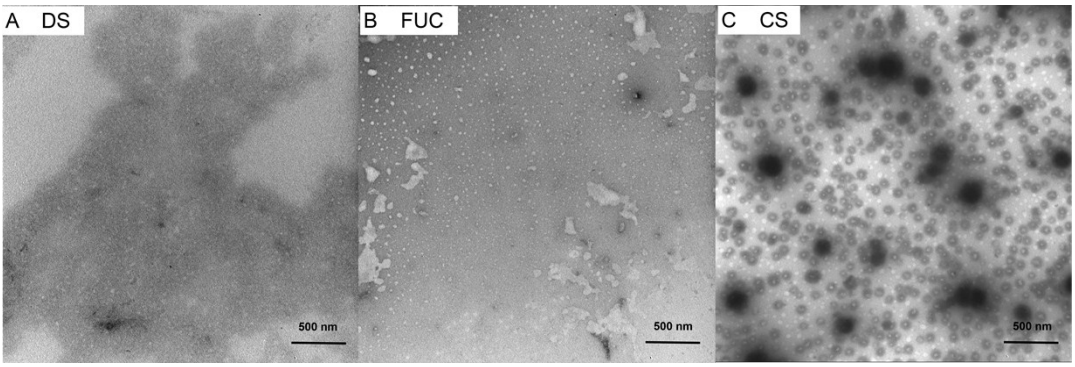

Fig. S2 TEM images of DS (A), FUC (B), and CS (C). [polysaccharide]=0.3 mg/mL, pH=3.8.

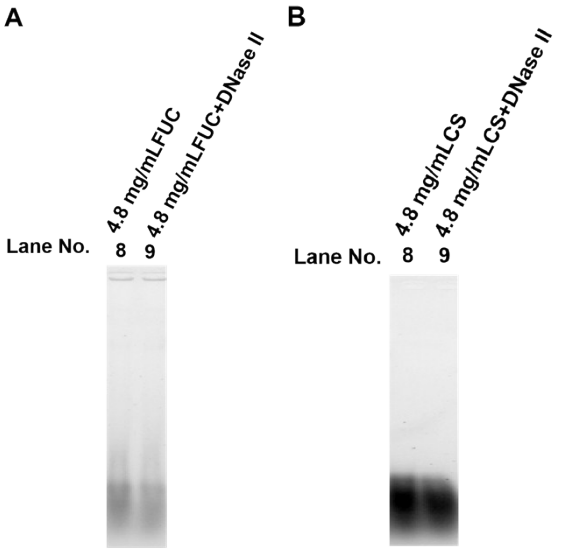

Fig. S3 Electropherogram of polysaccharide and DNase II mixed. (A) FUC; (B) CS. Lane 8: Only polysaccharide was added without DNA to demonstrate the possibility of DNA mixed in polysaccharide. Lane 9: Only polysaccharide and DNase II were added to prove that the hybridization of DNA in the polysaccharide was still present after the reaction. pH 3.8, 37°C, 30 min. The pH was adjusted to 8.0 to stop the reaction. [polysaccharide]=4.8 mg/mL, [DNase II]=0.1 mg/mL.

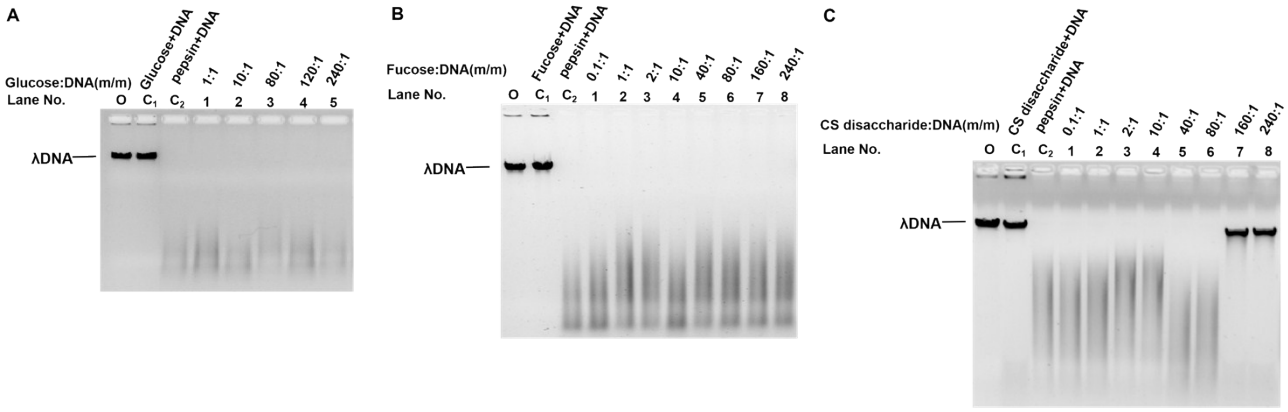

Fig. S4 Effects of glucose (A), fucose (B), and chondroitin sulfate disaccharide (C) on the digestion of DNA by pepsin. O: Only DNA was added without polysaccharide and pepsin. C_1: Only polysaccharide (the concentration of polysaccharide corresponding to the highest mass ratio of sugar to DNA in electrophoresis) and DNA were added without pepsin. C_2: Positive control in which DNA was digested by pepsin without adding polysaccharide. The remaining lanes were a mixture of polysaccharide and DNA in a mass ratio of 0.1:1-240:1, while pepsin and DNA concentrations were 1 mg/mL and 0.03 mg/mL, respectively. The reactions were carried out at 37°C for 2 h (pH 3.8).

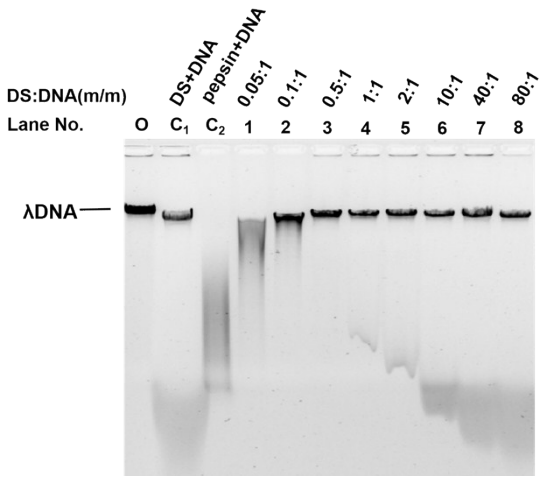

Fig. S5 Effects of DS (Mw: 40000) on the digestion of DNA by pepsin. O: Only DNA was added without polysaccharide and pepsin. C_1: Only polysaccharide (the concentration of polysaccharide corresponding to the highest mass ratio of sugar to DNA in electrophoresis) and DNA were added without pepsin. C_2: Positive control in which DNA was digested by pepsin without adding polysaccharide. The remaining lanes were a mixture of polysaccharide and DNA in a mass ratio of 0.05:1-80:1, while pepsin and DNA concentrations were 1 mg/mL and 0.03 mg/mL, respectively. The reactions were carried out at 37°C for 2 h (pH 3.8).

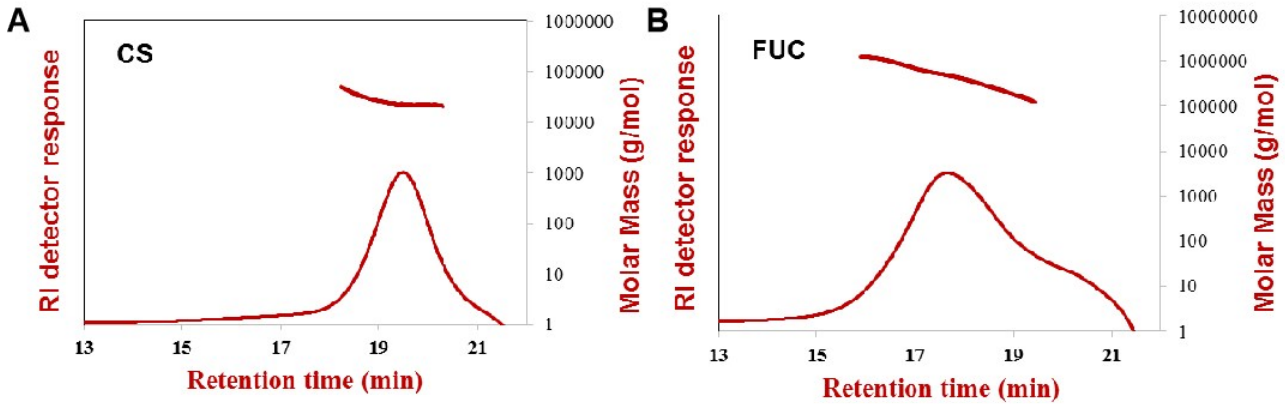

Fig. S6 The molecular weight of CS (A) and FUC (B). The specific refractive index increment (dn/dc) of CS and FUC was 0.12 mL/g.

Table. S1 Zeta potential of DS, FUC, and CS at a concentration of 1 mg/mL and a pH of 3.8.

Polysaccharides	Zeta-potential (mV)
DS	**-6.64**
FUC	**-16.82**
CS	**-3.06**