

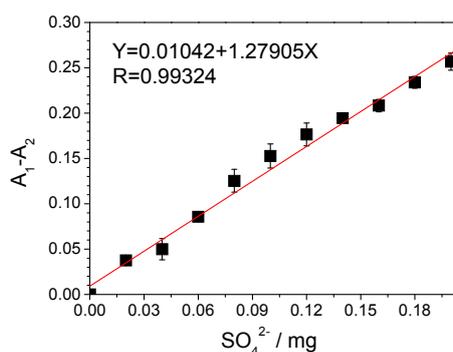
# Supplementary Materials: Repair Effect of Seaweed Polysaccharides with Different Contents of Sulfate Group and Molecular Weights on Damaged HK-2 Cells

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## 1. Standard Curve for Analysis of Sulfate Group Content

The sulfate content of polysaccharides was determined by the BaCl<sub>2</sub>-gelatin turbidity method [18]. In a typical procedure, 0.3% gelatin solution was prepared in hot water (60–70 °C) and stored at 4 °C overnight. Two grams of BaCl<sub>2</sub> was dissolved in gelatin solution and allowed to stand for 2–3 h at 25 °C. About 0.20 mL of polysaccharide solution (1.4 mg/mL) was added to 3.8 mL of 0.5 M HCl and 1 mL of BaCl<sub>2</sub>-gelatin reagent, and the mixture was allowed to stand for 10–20 min. A blank was prepared with 0.2 mL of water instead of SPS solution. The released barium sulfate suspension was measured at  $\lambda = 360$  nm by UV–VIS spectrophotometry using potassium sulfate as standard.

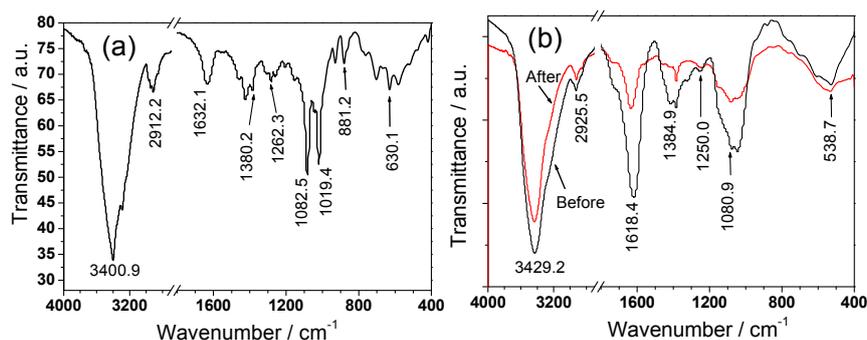
The standard curve was shown in Figure S1. The obtained regression equation is:  $Y = 0.01042 + 1.27905X$ ,  $n = 11$ ,  $R = 0.99324$  (Figure 1).



**Figure S1.** Standard curve for determination of sulfate group content in seaweed polysaccharides by BaCl<sub>2</sub>-gelatin method. Regression equation is:  $Y = 0.01042 + 1.27905X$ ,  $R = 0.99324$ .

## 2. FT-IR Spectra of Six Low-Molecular-Weight Polysaccharides

Figure S2 shows the FT-IR spectra of the six algal polysaccharides. FT-IR spectra suggested a positive correlation between the absorption peak intensity of  $-\text{SO}_3\text{H}$  (1249.2–1262.8  $\text{cm}^{-1}$ ) and  $-\text{SO}_3\text{H}$  content of polysaccharides (Figure S3). For instance, peak intensity of  $-\text{SO}_3\text{H}$  of Laminarin-1 was the strongest, and its  $-\text{SO}_3\text{H}$  content was the highest (21.7%). An approximate linear relationship between the peak intensities of  $-\text{SO}_3\text{H}$  and  $-\text{SO}_3\text{H}$  contents can be obtained (Figure S3).



**Figure S2.** Cont.

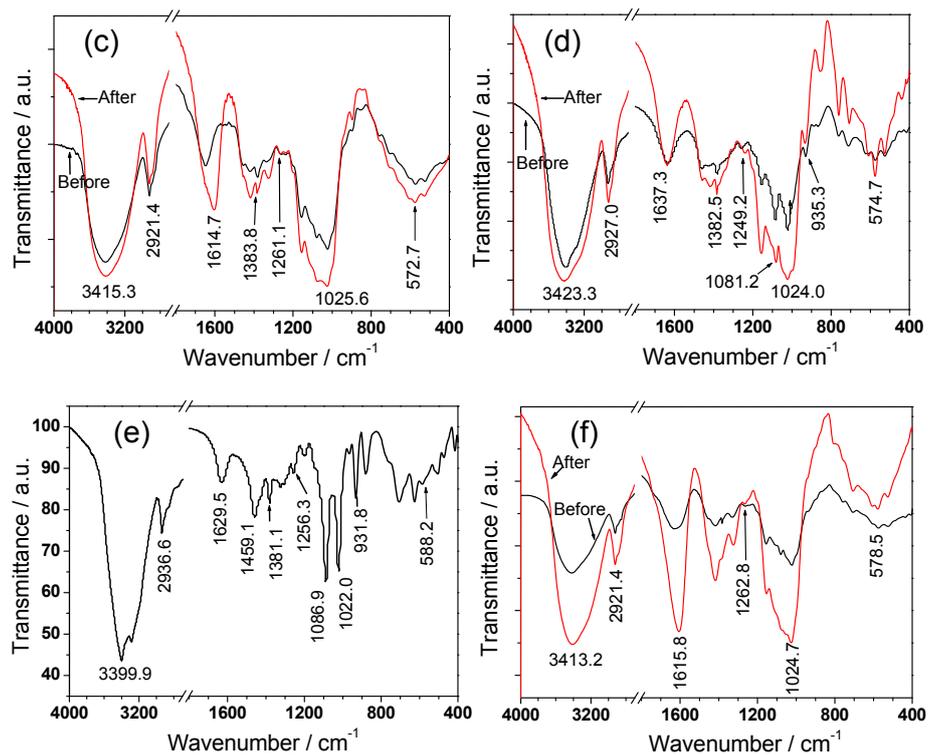


Figure S2. FT-IR spectra of (a) *Laminaria*-1; (b) degraded *Porphyra*-2; (c) degraded *Gracilaria*-3; (d) degraded *Sargassum*-4; (e) *Eucheuma*-5; and (f) degraded *Undaria*-6 polysaccharides.

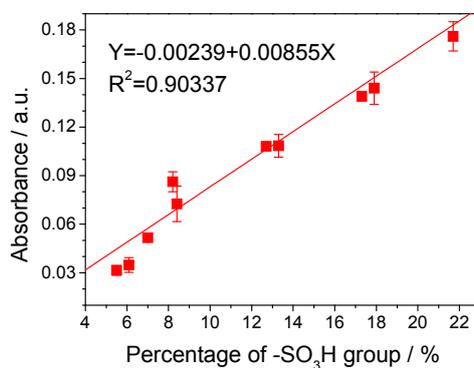


Figure S3. Relationship between the content of -SO<sub>3</sub>H in seaweed polysaccharides and the intensity of -SO<sub>3</sub>H absorption peak in FT-IR.

