

Structural characterization and anti-colic effects of a new degraded polysaccharide from fucoidan

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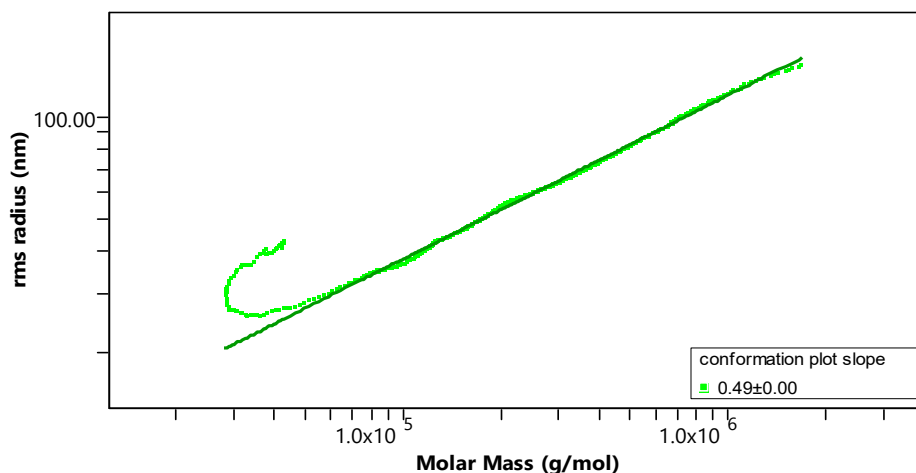
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1. Supplementary Figures

1.1 Fig S1



Supplementary Fig S1. The dependence of radius of gyration on molar mass.

Fig S1. showed the relationship between molecular weights and radius of gyration. Based on the theory of polymer solution, the slope of R_g -Mw value 0.33, 0.5-0.6 and 1 showed chain shapes of sphere, random coil, and rigid rod, respectively (Meng et al., 2018; Nie et al., 2020). As calculated from Fig. S1., the slope of R_g -Mw was 0.49, which indicated that fucoidan existed as a random coil in aqueous solution. The radius of gyration has applications in structural, mechanical and molecular engineering. It is defined as the distance between an axis and the point of maximum inertia in a rotating system.

1.2 Fig S2

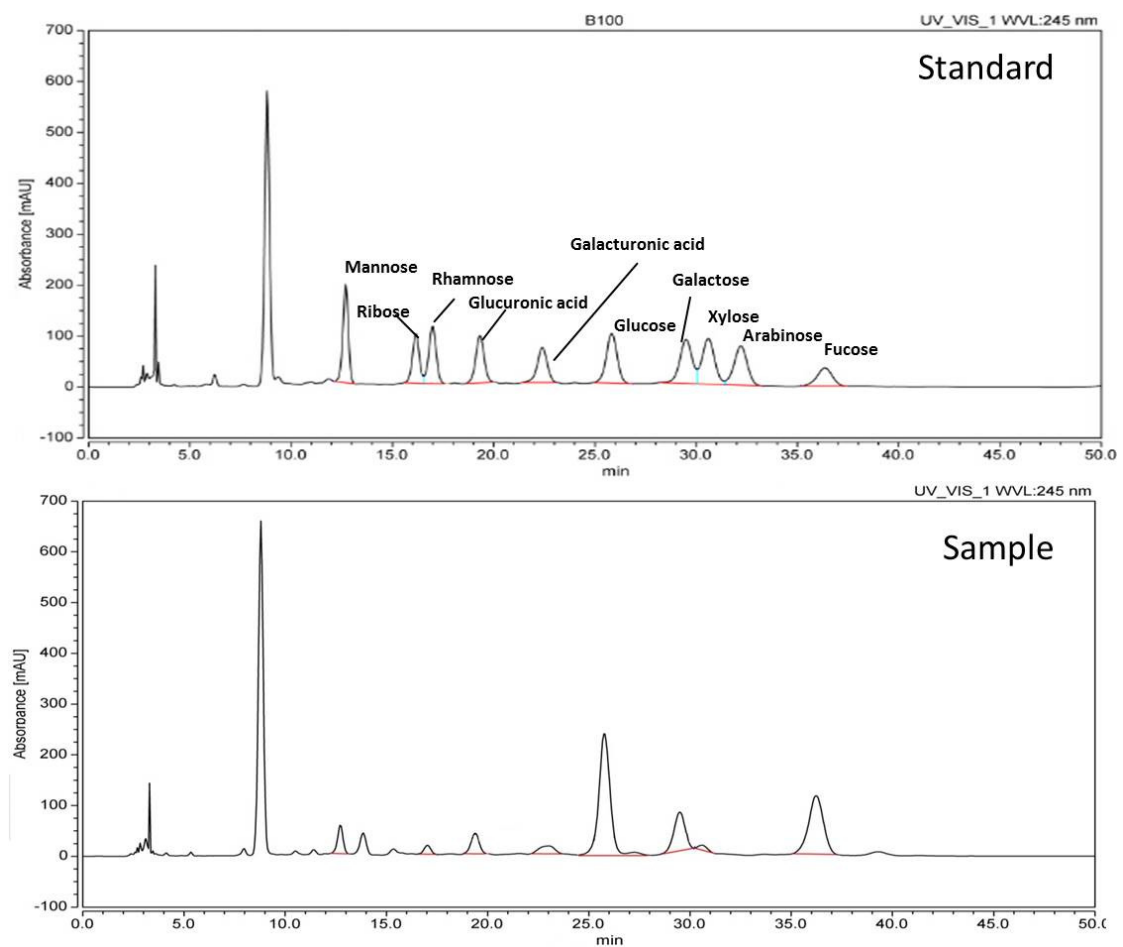
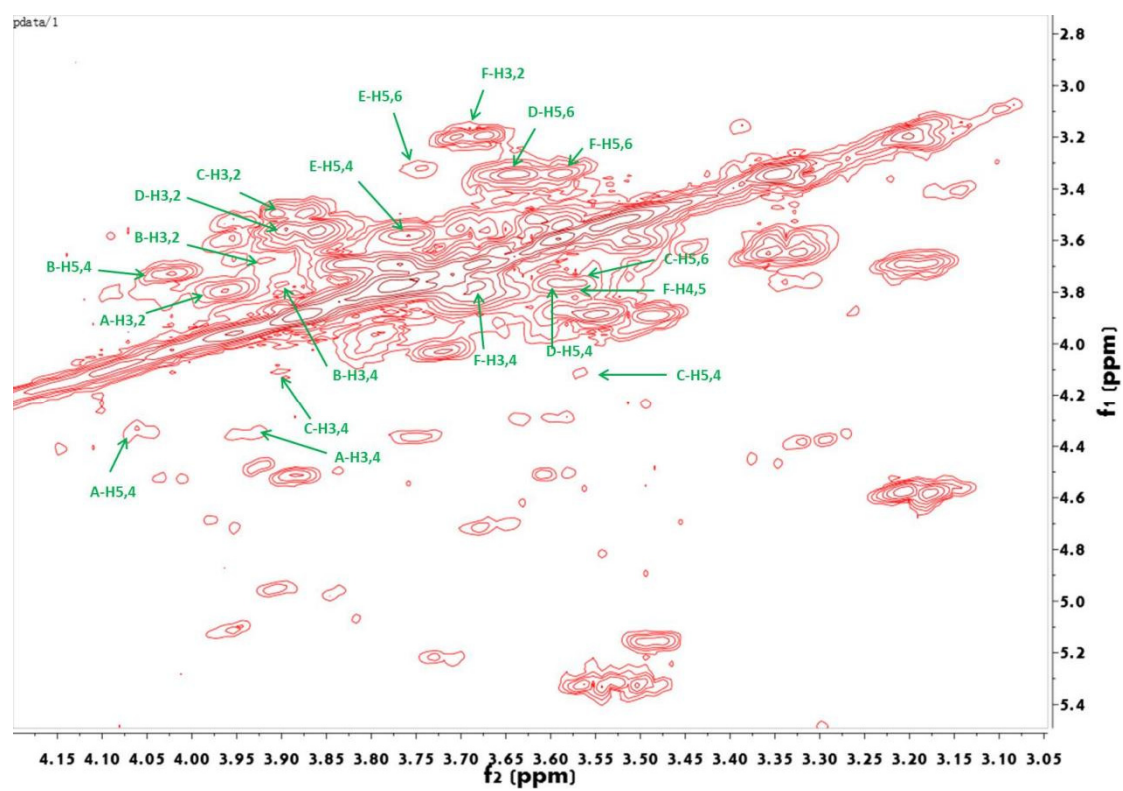
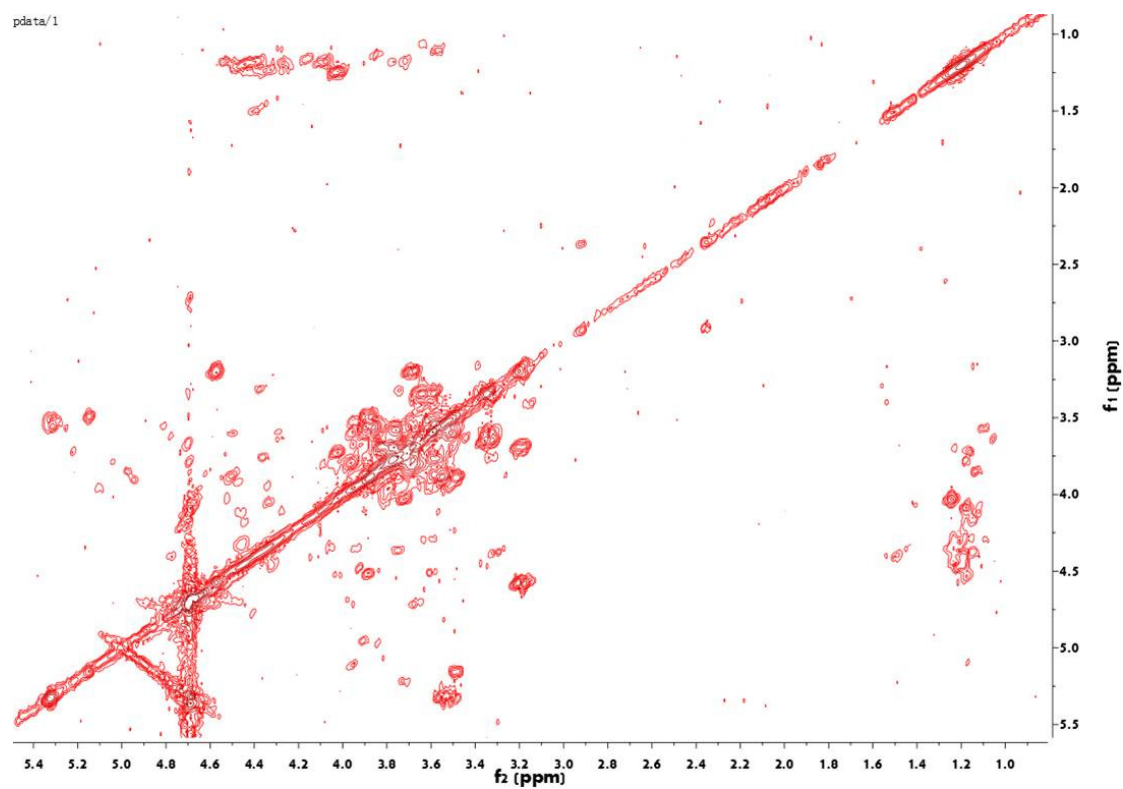


Fig S2 Monosaccharide composition determination of **Fuc-S**.

1.3 Fig S3



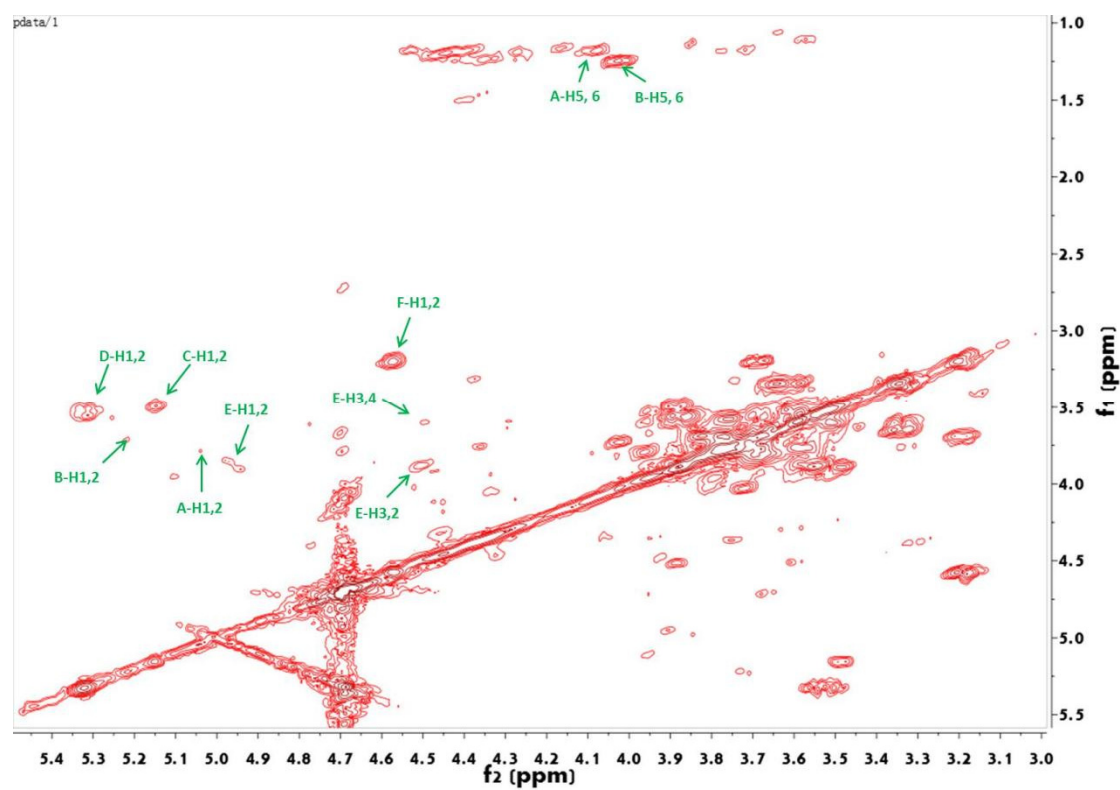


Fig S3 Enlarged ^1H - ^1H COSY of Fuc-S

1.4 Fig S4

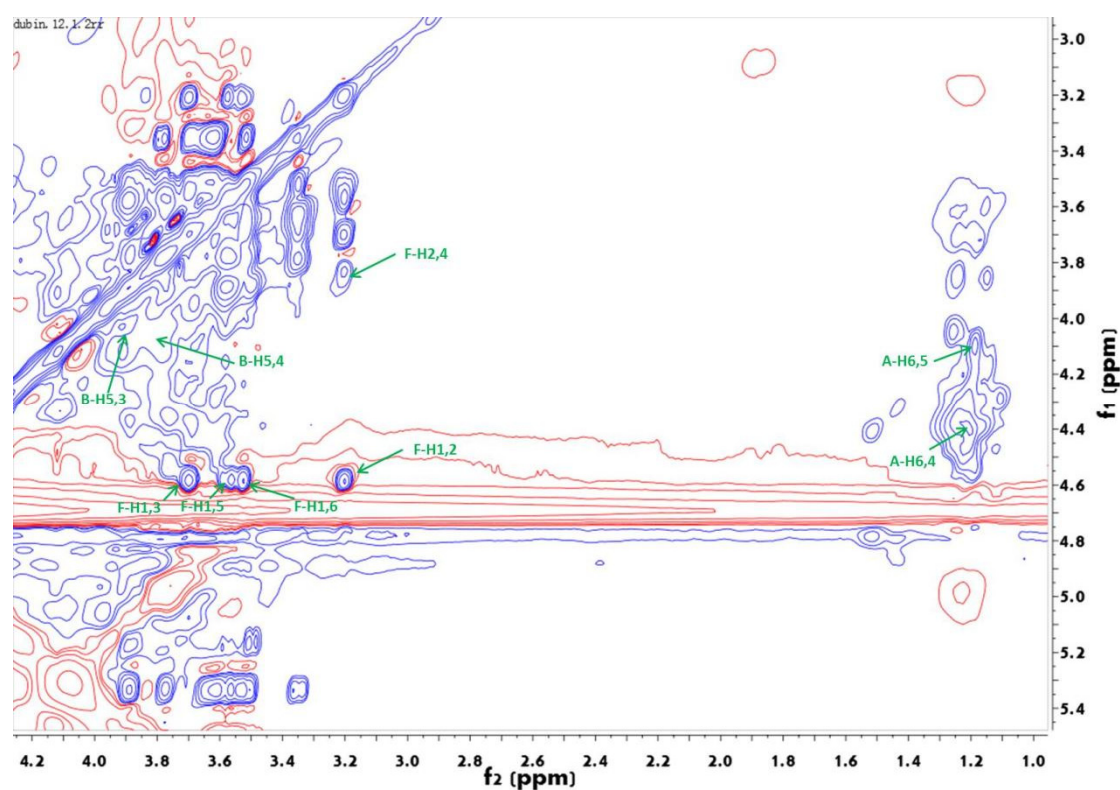
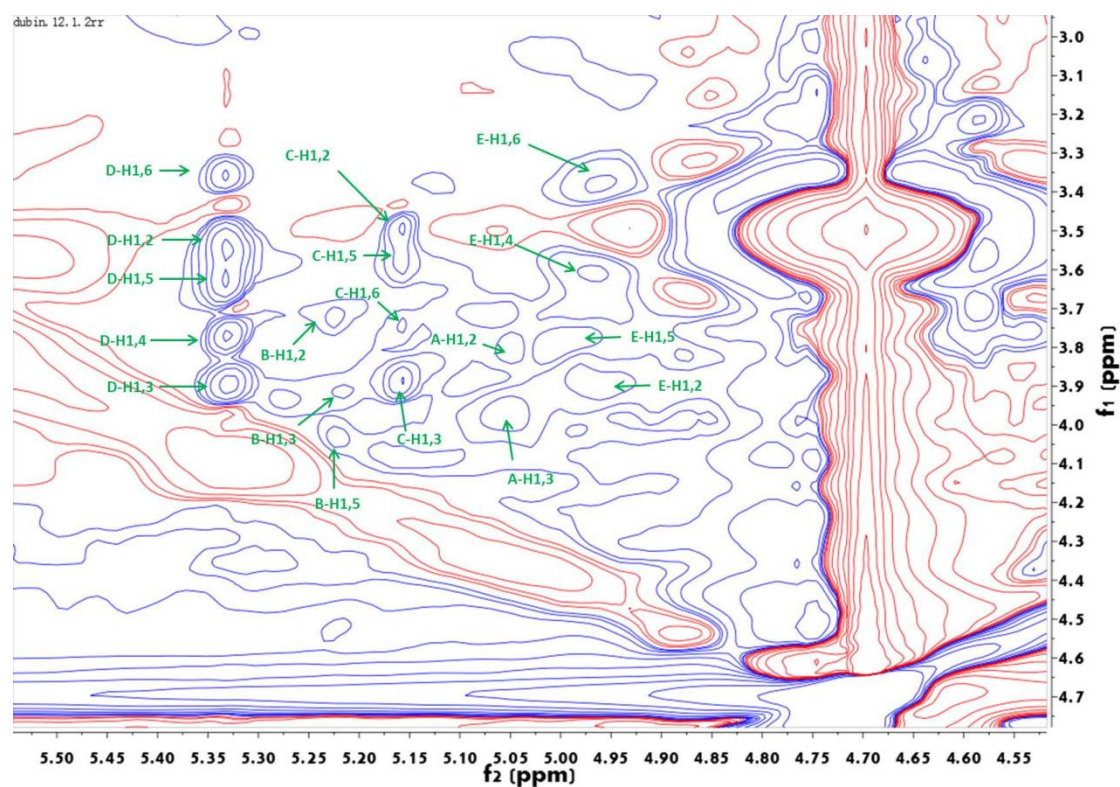


Fig S4 Enlarged ^1H - ^1H TOCSY of Fuc-S.

1.5 Fig S5

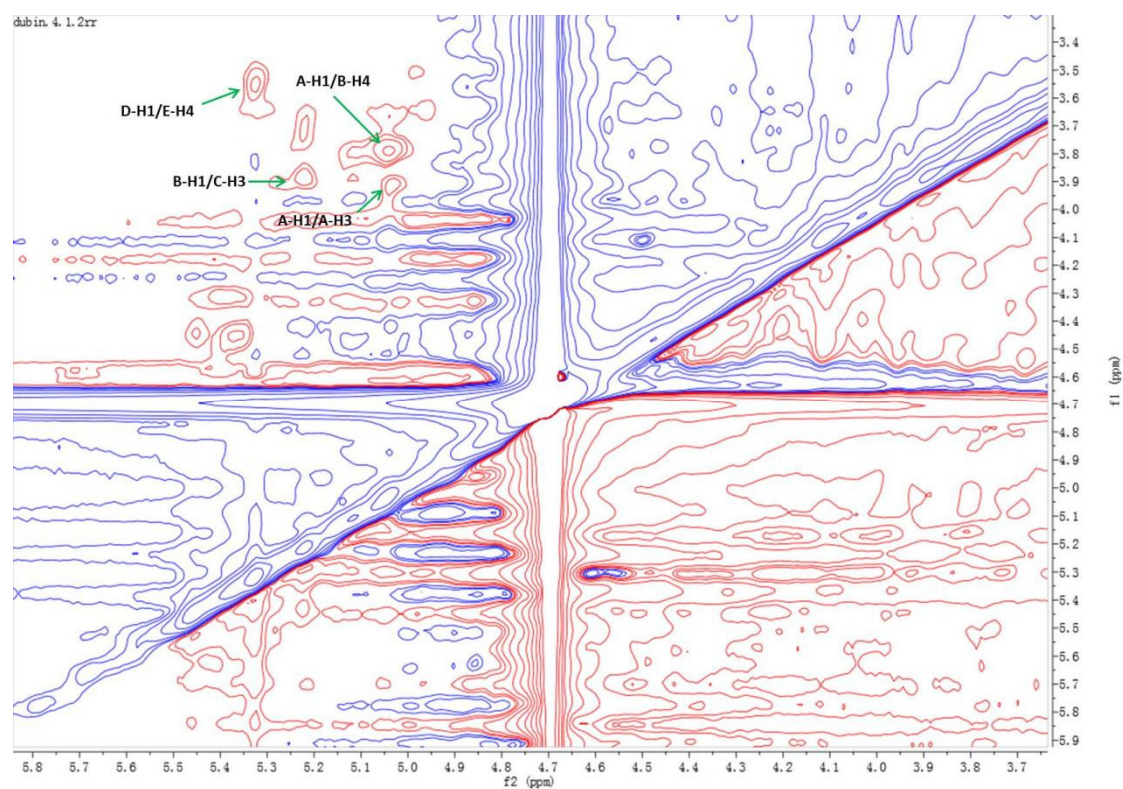


Fig S5 Enlarged ^1H - ^1H ROESY of Fuc-S.

1.6 Fig S6

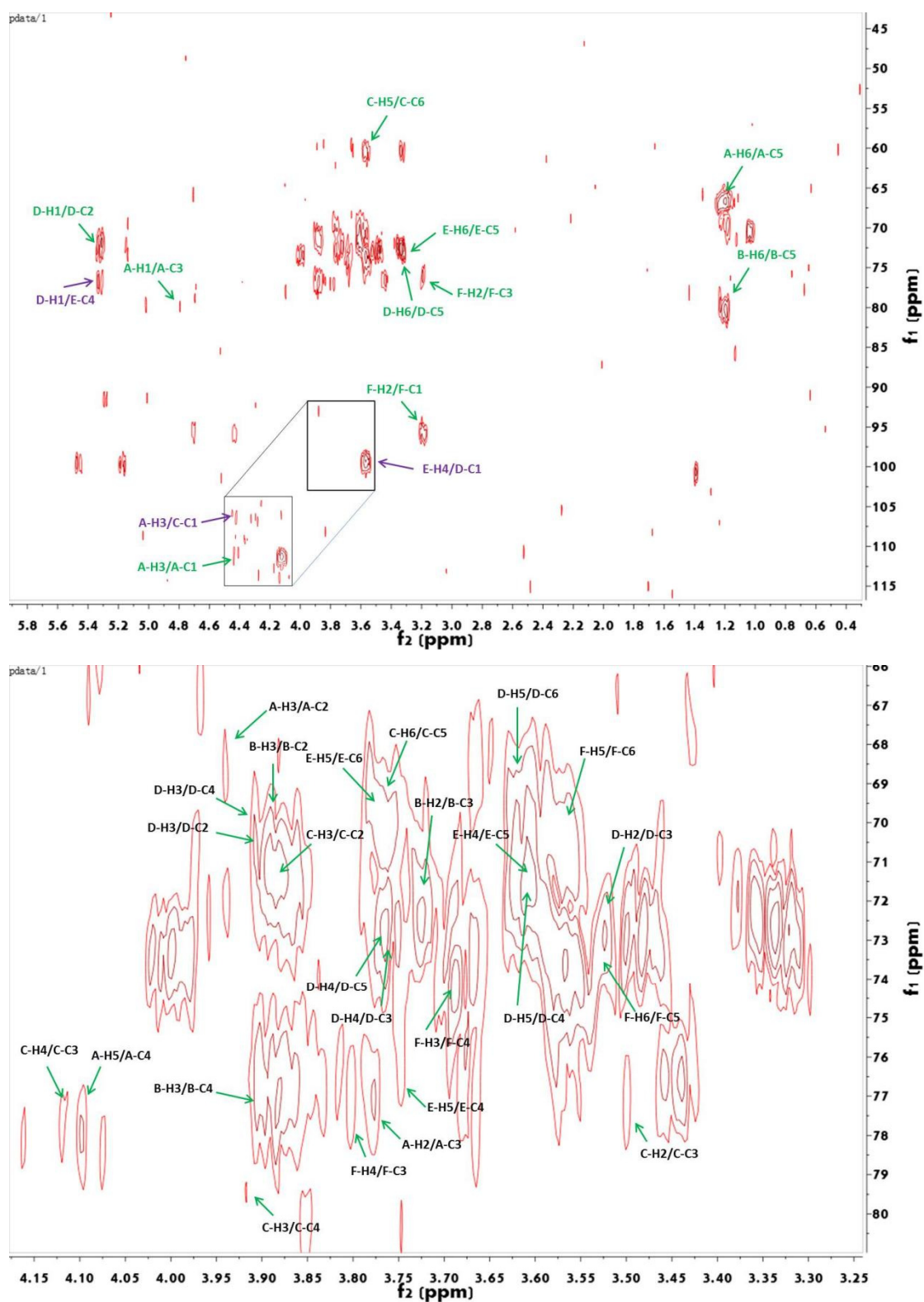


Fig S6 Enlarged ^1H - ^1H ROESY of Fuc-S.

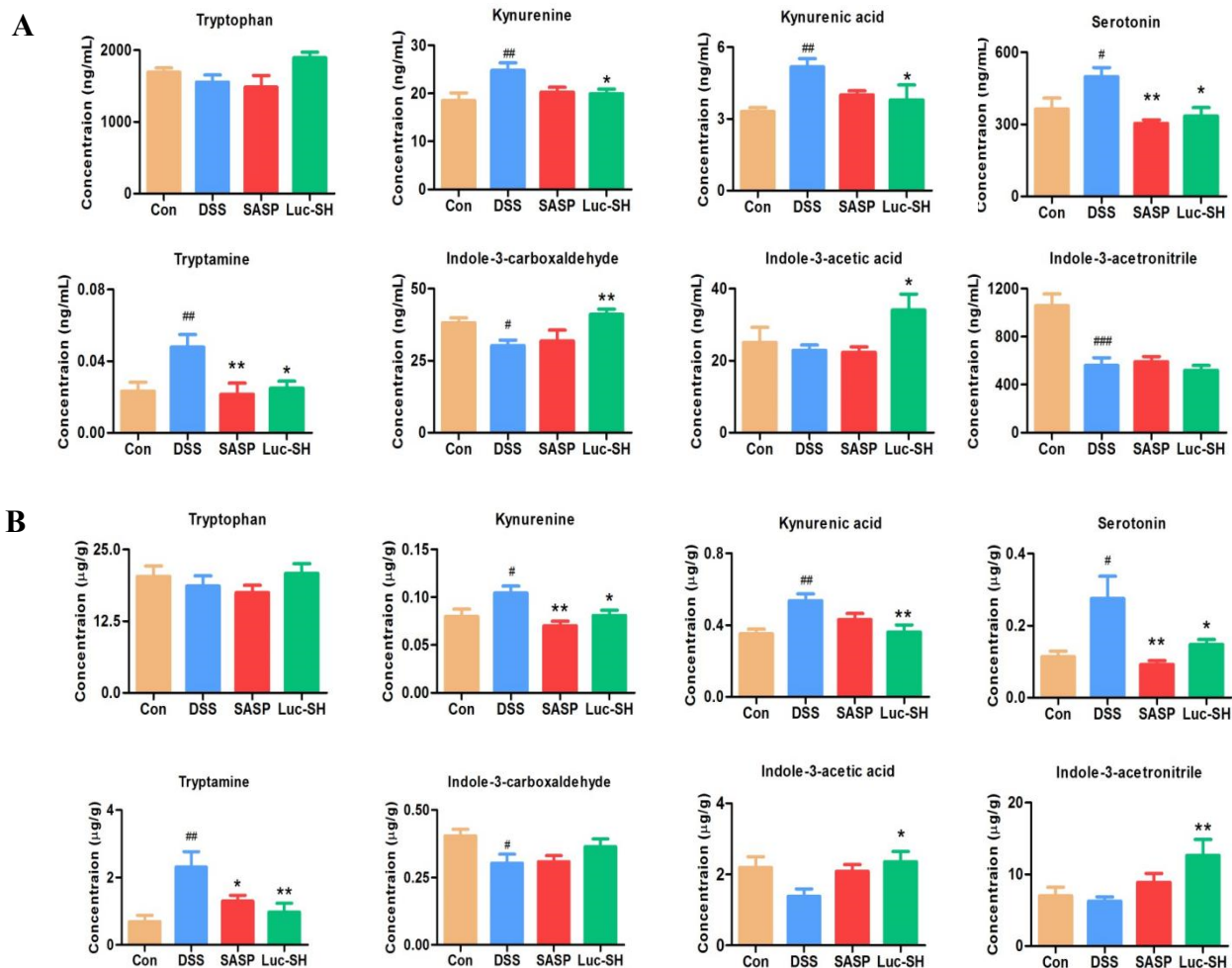


Fig S7 Fuc-S modulated host-microbe tryptophan metabolism of DSS-induced chronic colitis in mice. (A) The changes of tryptophan, kynurenine, kynurenic acid, serotonin, tryptamine, indole-3-acetic acid, indole-3-acetonitrile and indole-3-carboxaldehyde in the serum. (B) The changes of tryptophan, kynurenine, kynurenic acid, serotonin, tryptamine, indole-3-acetic acid, indole-3-acetonitrile and indole-3-carboxaldehyde in the feces. Results are expressed as mean \pm SEM. (n=7-9) and analyzed using ANOVA followed by Duncan's multiple range tests. [#] $p < 0.05$, ^{##} $p < 0.01$ and ^{###} $p < 0.001$, compared to Con group; ^{*} $p < 0.05$, ^{**} $p < 0.01$ and ^{***} $p < 0.001$, compared to DSS group. Con: control, SASP: salazosulfadimidine, Fuc-SH: Fuc-S with high dosage (200 mg/Kg).

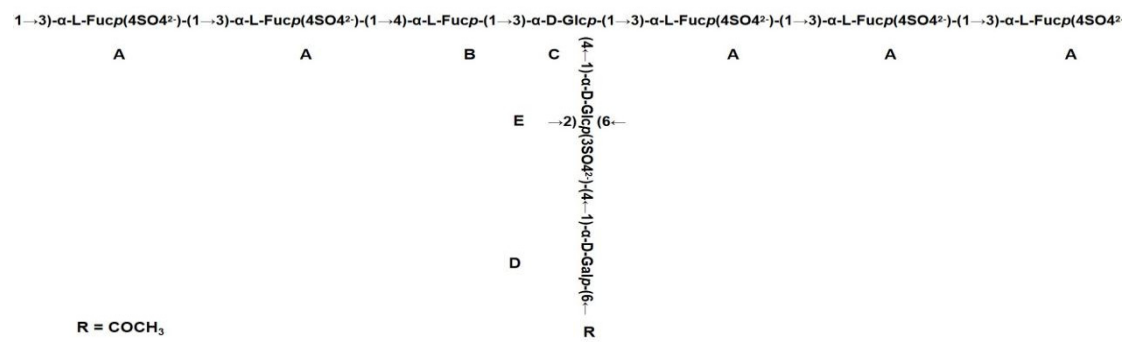


Fig S8 Predicted structure of Fuc-S.

2. Supplementary Table

Supplementary Table S1. The MRM transition for quantification tryptophan metabolites.

Compound Name	Prec Ion	Prod Ion	Frag (V)	CE (V)	Polarity
L-Kynurenine	209.1	192.1	50	5	Positive
L-Kynurenine	209.1	94	50	9	Positive
L-Tryptophan	205.1	188	90	5	Positive
L-Tryptophan	205.1	118	90	29	Positive
Kynurenic acid	190	144	110	17	Positive
Kynurenic acid	190	89	110	45	Positive
Serotonin	177.1	160	90	9	Positive
Serotonin	177.1	115	90	29	Positive
3-Indole-acetic acid	176.1	130	110	13	Positive
3-Indole-acetic acid	176.1	77	110	41	Positive
Tryptamine	161.1	144	50	9	Positive
Tryptamine	161.1	115.1	50	37	Positive
Indole-3-carboxaldehyde	146.1	118.1	110	13	Positive
Indole-3-carboxaldehyde	146.1	91.1	110	33	Positive