Figure S1 Effect of *Caulerpa lentillifera* polysaccharides on daily food intake in immunosuppressed mice. NC, normal control; MC, model control; PC, positive control; HCLP, 100 mg/kg·bw CLP; MCLP, 50 mg/kg·bw CLP; LCLP, 25 mg/kg·bw CLP.
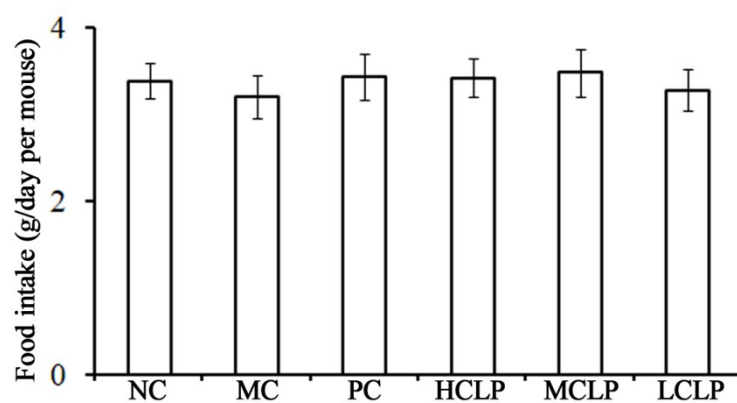
Figure S2 The *in vitro* fermentation of *Caulerpa lentillifera* polysaccharides with the feces from normal BALB/c mice at 0, 6, 12, 24, 48 and 72 h. (a) OD600 nm of gut microbiota compared between blank and CLP groups; (b) Total sugar content and reducing sugar content of CLP detected at 490 nm and 525 nm, respectively; (c) Production of SCFAs including acetate, propionate and butyrate during *in vitro* fermentation between blank and CLP groups.
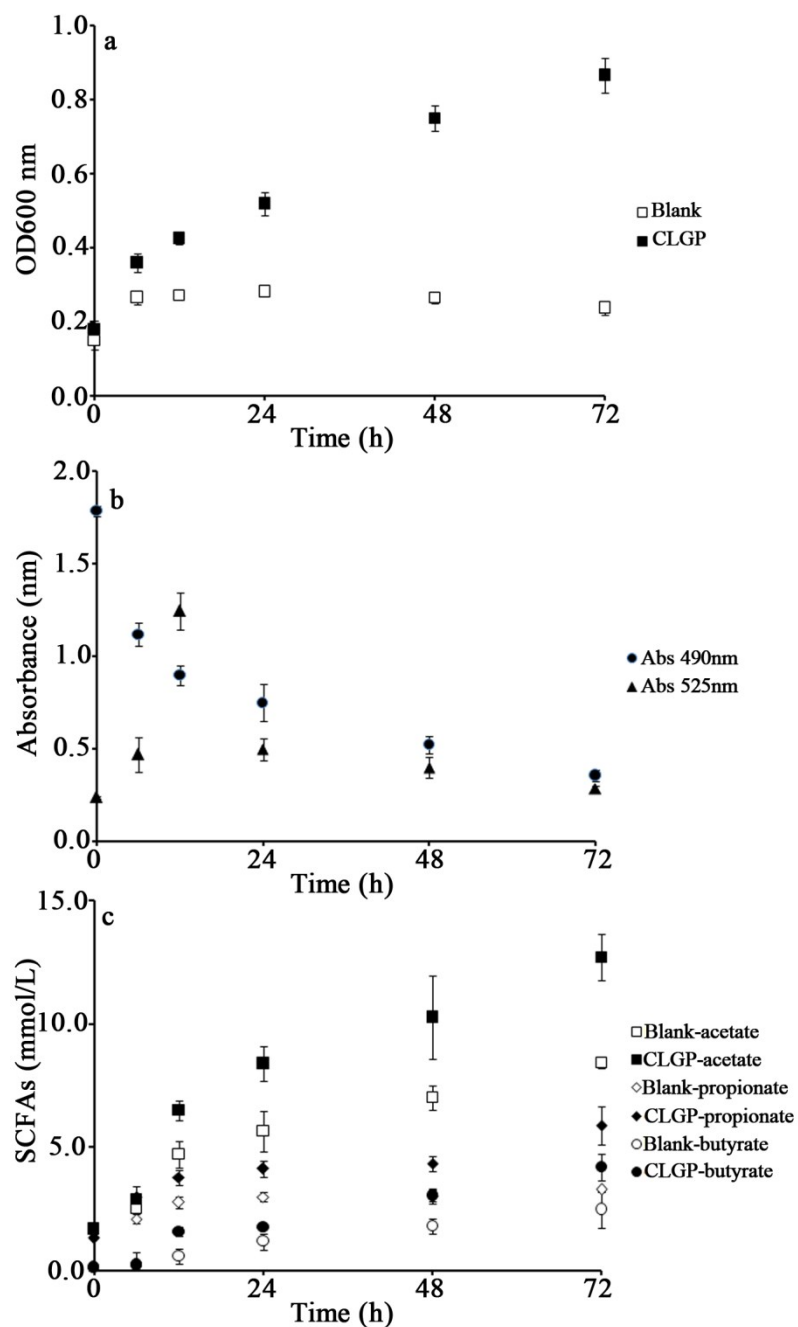
Figure S3 HPGPC chromatogram of *Caulerpa lentillifera* polysaccharides during the *in vitro* fermentation with the feces from normal BALB/c mice. (a) The calibration curve; (b) The blank spectrum was injected with 20 μL mobile phase, showing a peak at time of 27.172 min regarded as an impurity (*); (c) *in vitro* fermentation of CLP at 0 h; (d) *in vitro* fermentation of CLP at 6 h; (e) *in vitro* fermentation of CLP at 12 h; (f) *in vitro* fermentation of CLP at 24 h; (g) *in vitro* fermentation of CLP at 48 h; (h) and *in vitro* fermentation of CLP at 72 h.
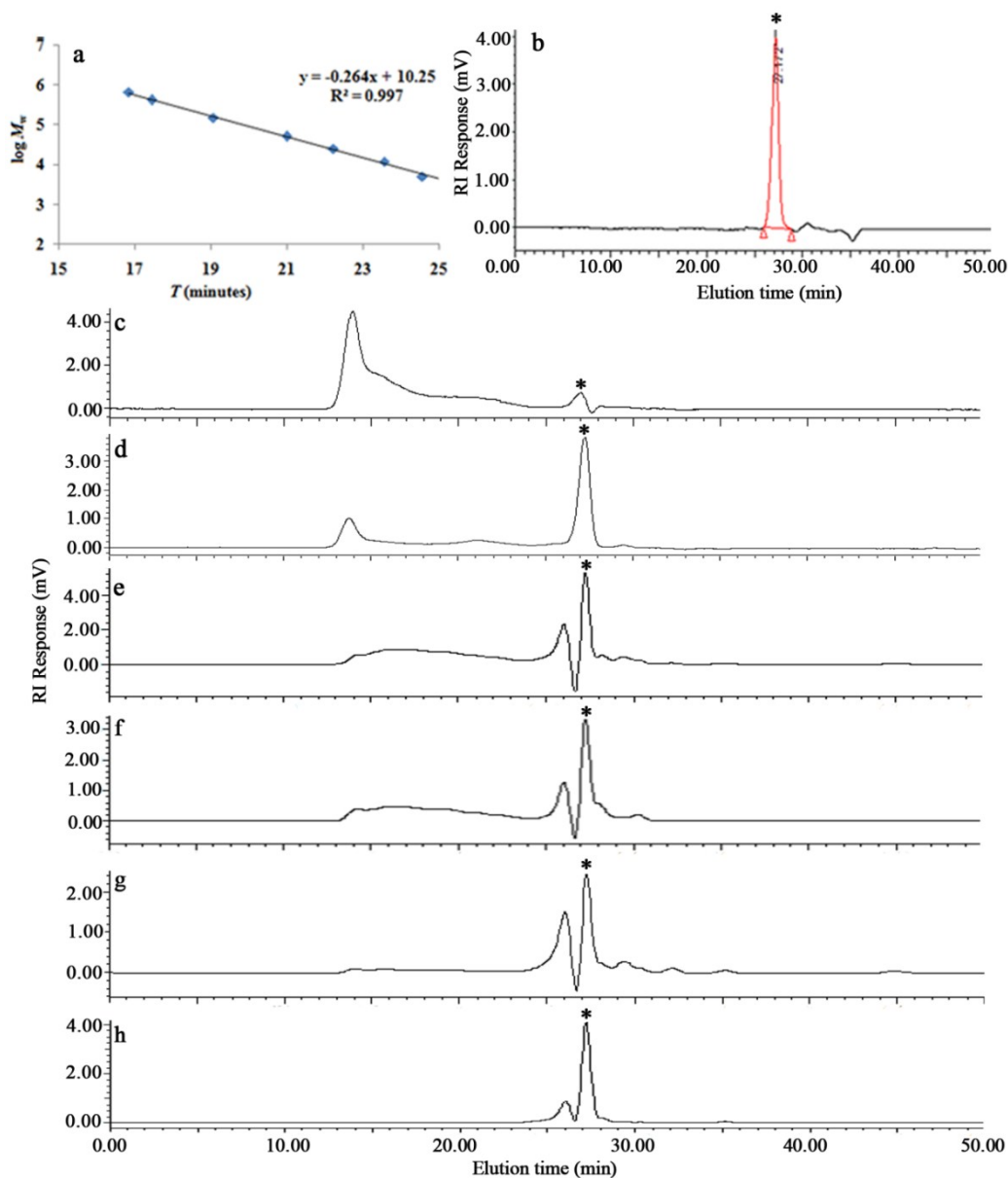
Figure S4 Effect of *Caulerpa lentillifera* polysaccharides on TNF-α mRNA expression of immunosuppressed mice in thymic tissue (a), splenic tissue (b) and colonic tissue (c); and IL-1β mRNA expression of immunosuppressed mice in thymic tissue (a'), splenic tissue (b') and colonic tissue (c') by qRT PCR analysis. NC, normal control; MC, model control; PC, positive control; HCLP, 100 mg/kg·bw CLP; MCLP, 50 mg/kg·bw CLP; LCLP, 25 mg/kg·bw CLP. Data are expressed as the mean ± SD (n=10). ***$p < 0.001$, **$p < 0.01$ and *$p < 0.05$ are compared with NC group; ###$p < 0.001$, ##$p < 0.01$ and #$p < 0.05$ are compared with MC group; △△△$p < 0.001$, △△$p < 0.01$ and △$p < 0.05$ are compared with PC group.
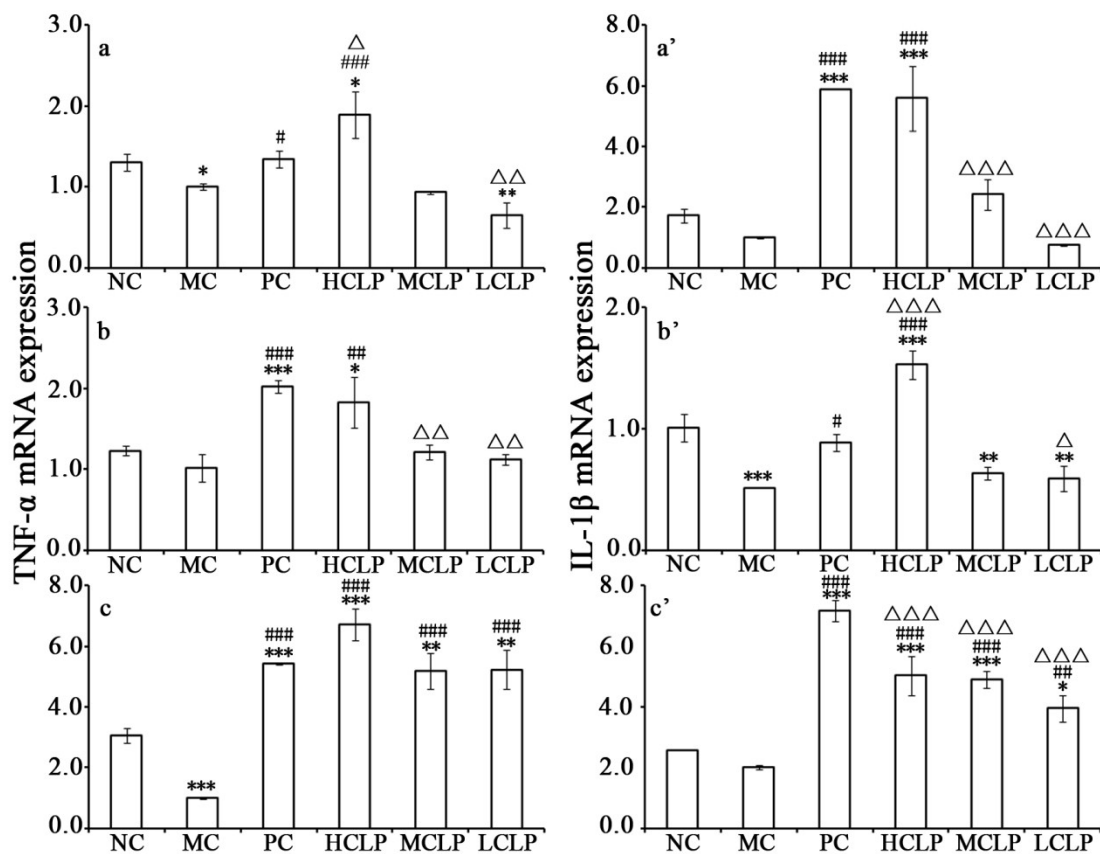
Figure S5 Rarefaction analysis of cecal content from randomly five mice in NC, MC, HCLP and MCLP groups. NC, normal control; MC, model control; HCLP, 100 mg/kg·bw CLP; MCLP, 50 mg/kg·bw CLP.

Figure S6 Shannon analysis of cecal content from randomly five mice in NC, MC, HCLP and MCLP groups. NC, normal control; MC, model control; HCLP, 100 mg/kg·bw CLP; MCLP, 50 mg/kg·bw CLP.
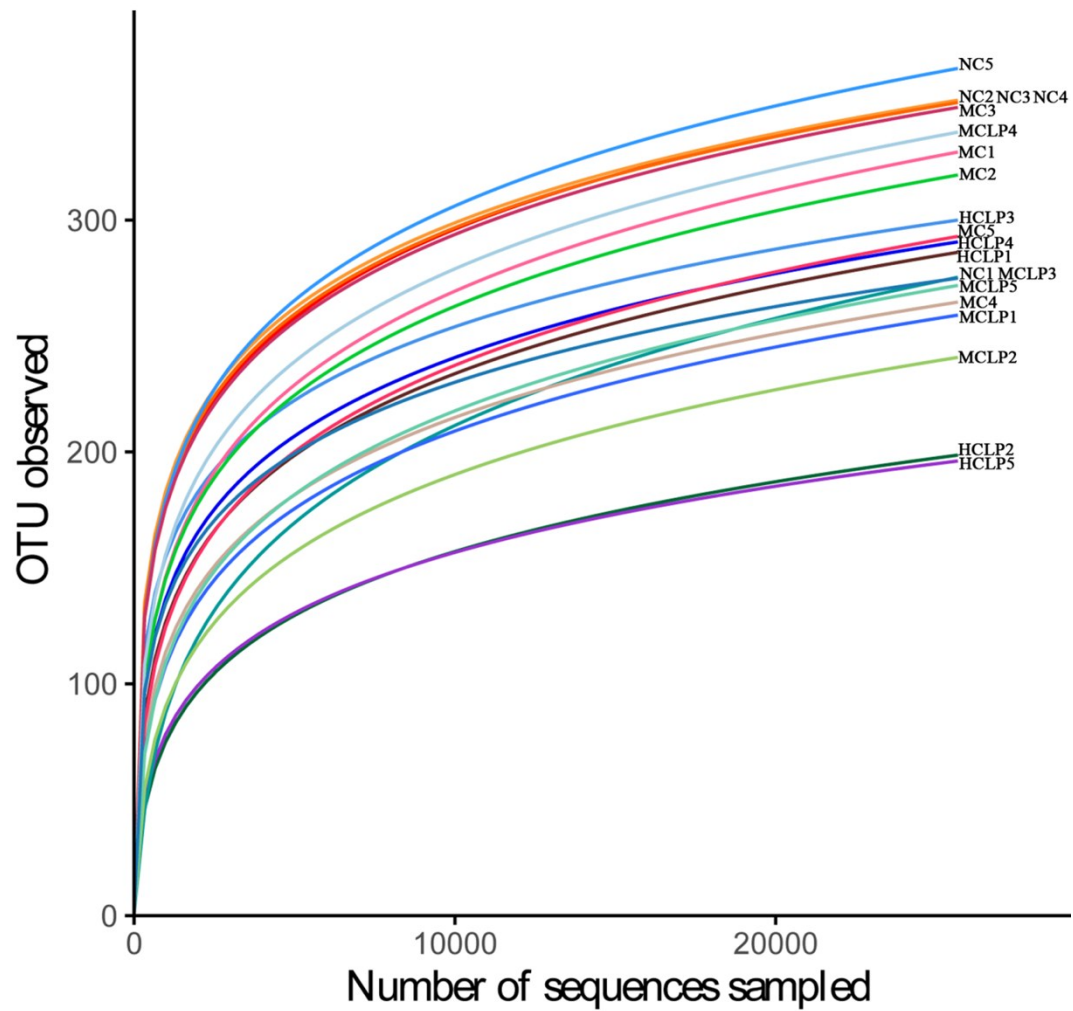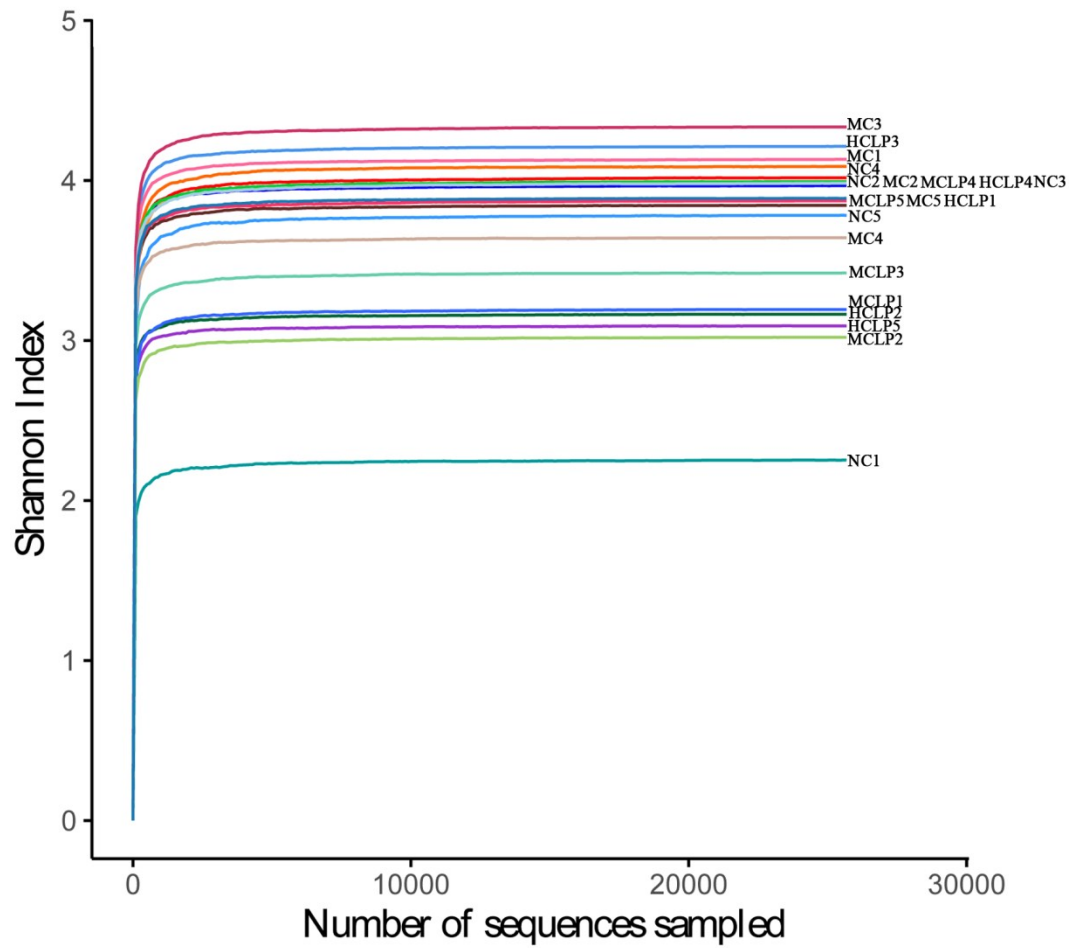
Table S1 Primers used in this study.

Name	Sequence
IL-1β Forward	CCTGTGTCTTTCCCGTGGAC
IL-1β Reverse	CATCTCGGAGCCTGTAGTGC
TNF-α Forward	CCAGACCCTCACACTCACAAAC
TNF-α Reverse	GTAGACAAGGTACAACCCATCG
β-actin Forward	CGGTGAAGGCGACAGCAGTTGGT
β-actin Reverse	AGGAGTGGGGGTGGCTTTTGGGA

Table S2 Diversity analysis of cecal content from randomly five mice in NC, MC, HCLP and MCLP groups. NC, normal control; MC, model control; HCLP, 100 mg/kg·bw CLP; MCLP, 50 mg/kg·bw CLP.

Group	OUTs	Good's Coverage	Chao1	Ace	Shannon index	Simpson index
NC	331	0.998388	363	358	3.62	0.8794
MC	305	0.998239	344	336	3.99	0.9592
HCLP	251	0.998333	292	287	3.66	0.9420
MCLP	272	0.998333	317	301	3.50	0.9223