

Supplementary Material

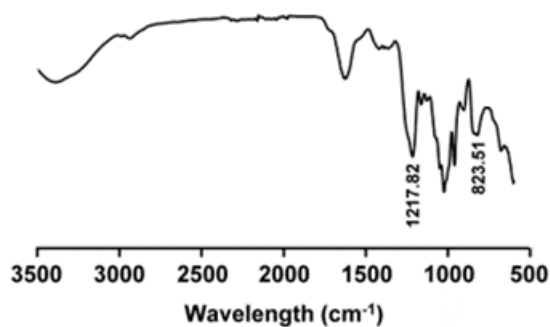


Figure S1: Fourier transform infrared spectrum of *Ecklonia cava*-extracted fucoidan (ECF).

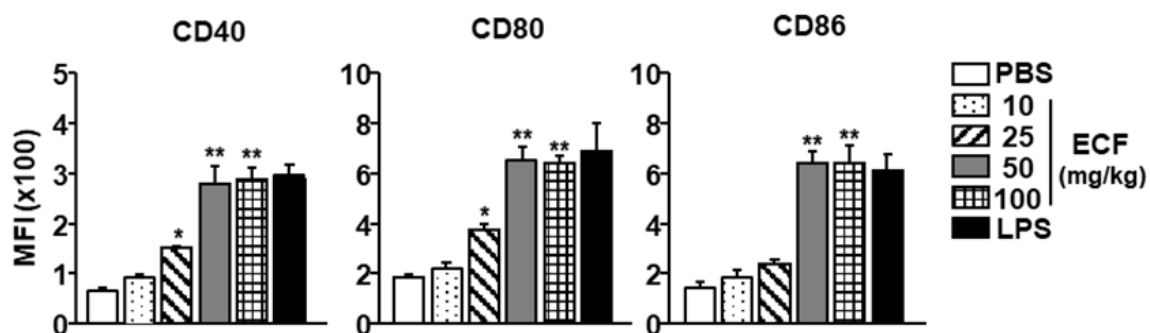


Figure S2: Dose dependent effect of ECF. C57BL/6 mice were injected intranasally with indicated dose of ECF. CD40, CD80, and CD86 expression levels in mediastinal lymph node (mLN) DCs were measured by flow cytometry 18 h after treatment ($n = 6$, two-way analysis of variance, ** $p < 0.01$).

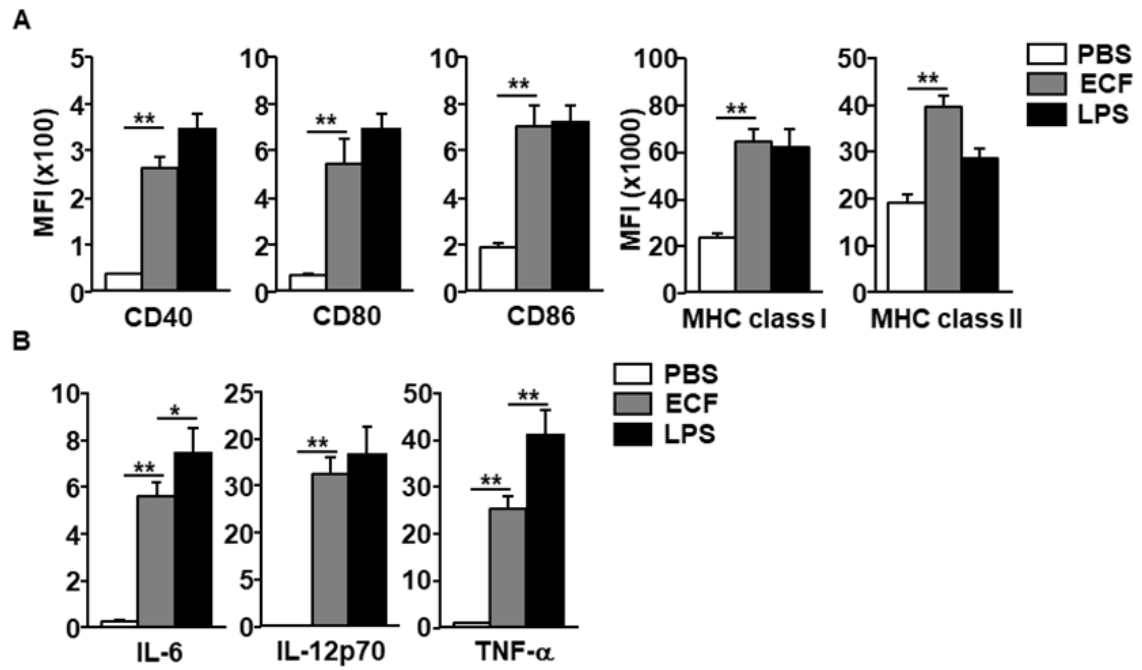


Figure S3: Intranasal injection of ECF activated mLN DCs in BALB/c mice. BALB/c mice were injected intranasally with 50 mg/kg of ECF. (A) CD40, CD80, CD86, MHC class I and II expression levels in mLN DCs were measured by flow cytometry 18 h after treatment ($n = 6$, two-way analysis of variance, $**p < 0.01$). (B) The levels of cytokines in bronchoalveolar lavage (BAL) fluid were measured by flow cytometry 18 h after treatment ($n = 6$, two-way analysis of variance, $*p < 0.05$ and $**p < 0.01$).

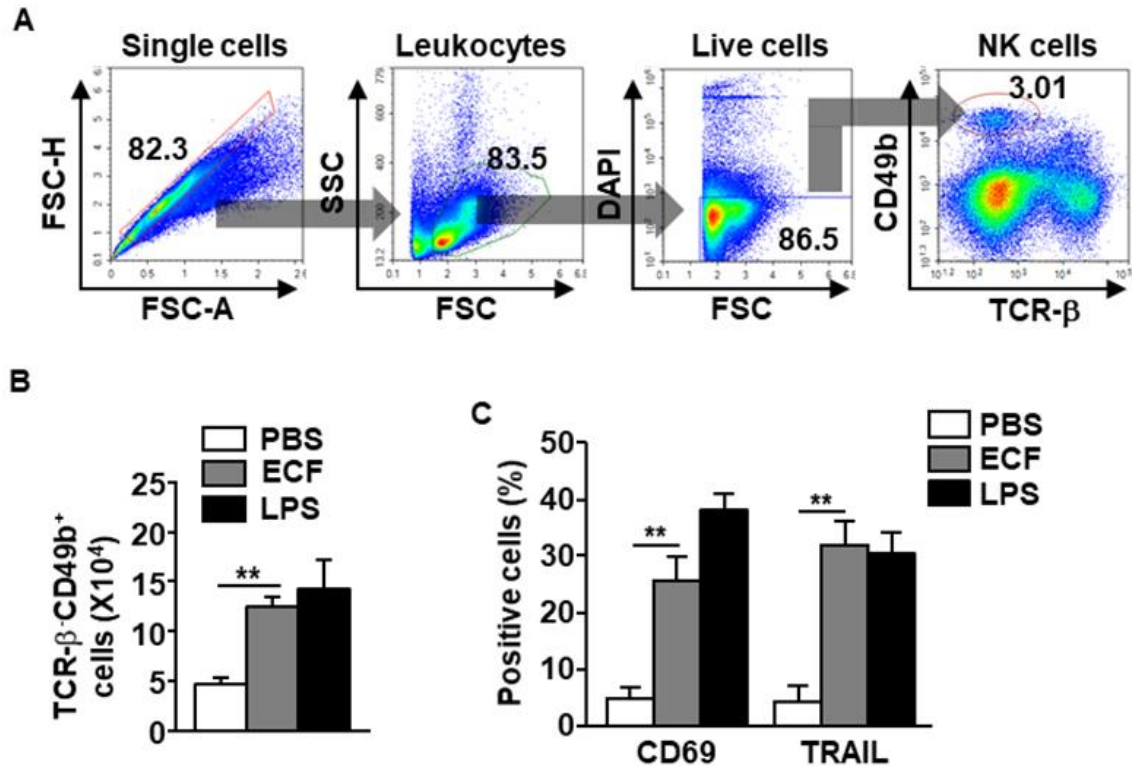


Figure S4: ECF promoted NK cell activation in BALB/c mLN. (A) Definition of NK cells in BALB/c mice are shown. (B) Average of NK cell number in the mLN ($n = 6$, two-way analysis of variance, $**p < 0.01$). (C) CD69 and TRAIL expression levels in mLN NK cells are shown ($n = 6$, two-way analysis of variance, $**p < 0.01$).

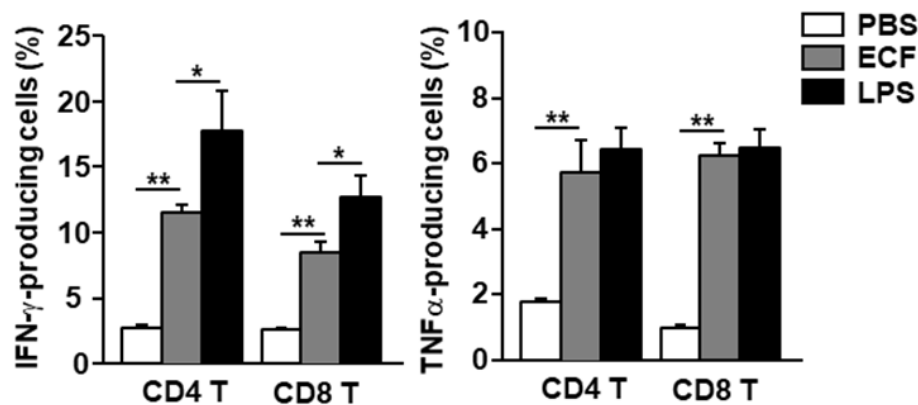


Figure S5. ECF induced Th1 and Tc1 immunity in mLN. BALB/c mice were *i.n.* administered 50 mg/kg ECF for twice 3 days interval and measured intracellular IFN- γ (left panel) and TNF- α (right panel) producing levels in CD4 and CD8 T cells ($n = 6$, two-way analysis of variance, $*p < 0.05$ and $**p < 0.01$).