Figures

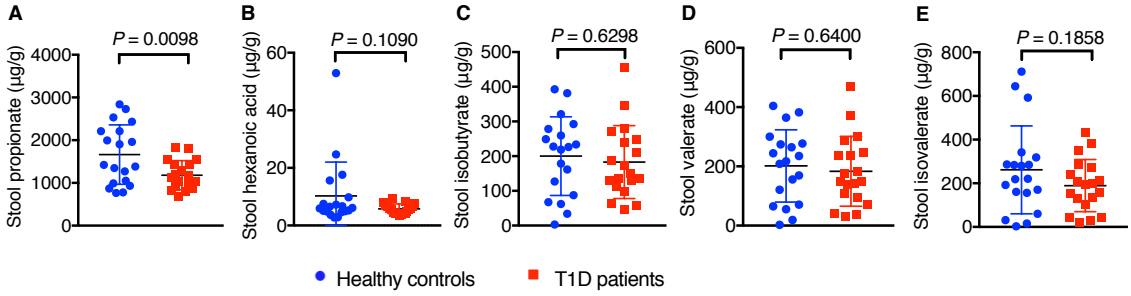


Figure S1. Stool SCFA production in individuals with T1D compared with control subjects. (**A**) Stool propionate, (**B**) Stool hexanoic acid, (**C**) Stool isobutyrate, (**D**) Stool valerate, and (**E**) Stool isovalerate (n = 19/group). Data are presented as mean ± SEM and were analyzed by a two-tailed Student's t-test.

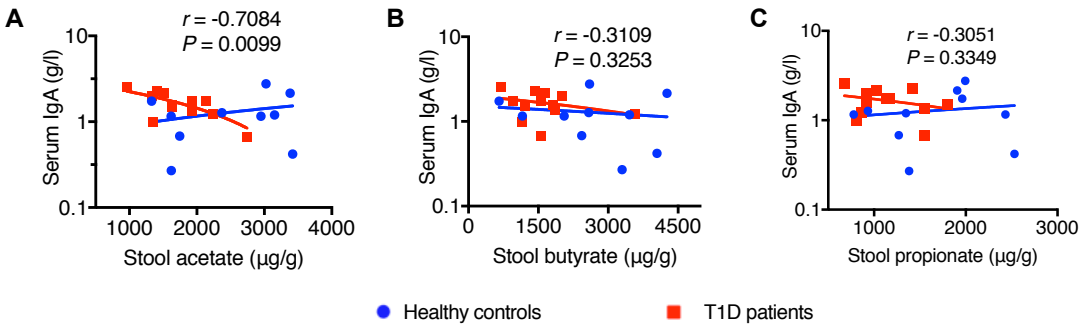


Figure S2. Correlation between serum IgA level and different stool SCFA concentration in individuals with T1D and control subjects. (A) Stool acetate, (B) Stool butyrate, and (C) Stool propionate (n = 10-12). Data were assessed for statistical significance using a two-tailed *Pearson* correlation coefficient test and/or linear regression.

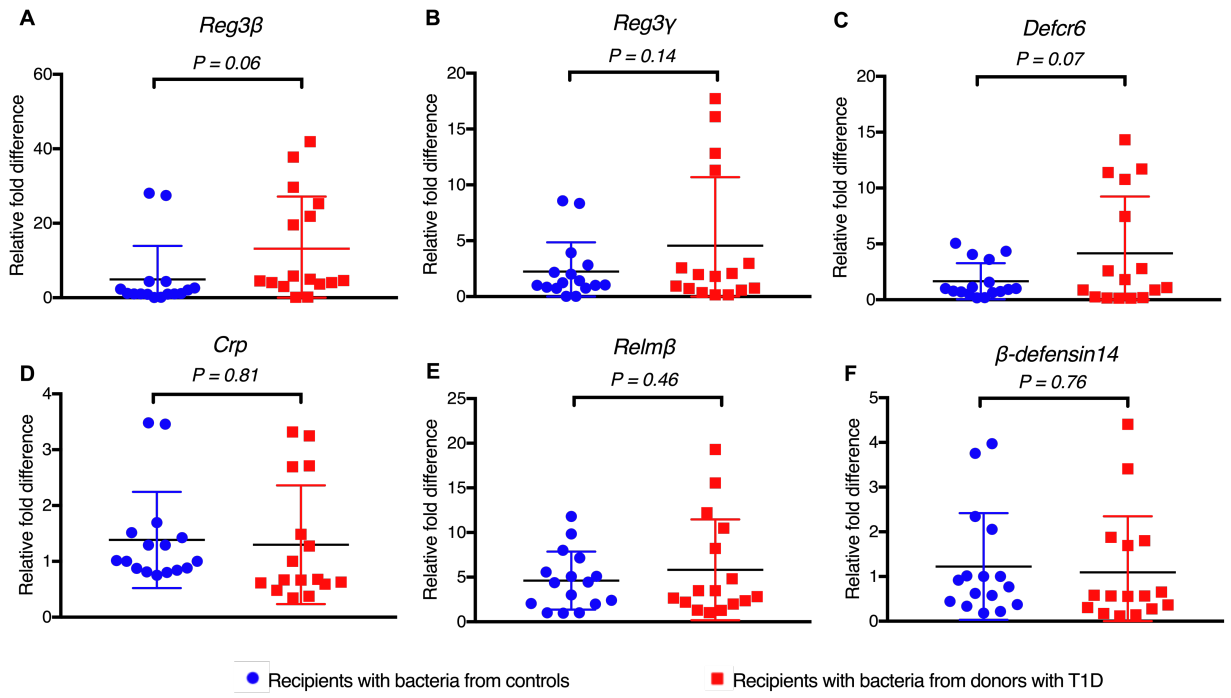


Figure S3. Expression of antimicrobial peptide genes in the small intestine of colonized germ-free (GF) NOD mice. (**A**) *Reg3β.* (**B**) *Reg3γ.* (**C**) *Defcr6.* (**D**) *Crp.* (**E**) *Relmβ.* (**F**) *β-defensin 14*. Data combined from four independent experiments are presented as mean ± SEM (*n* = 16/group), and were assessed for statistical significance using a two-tailed Student's *t*-test.

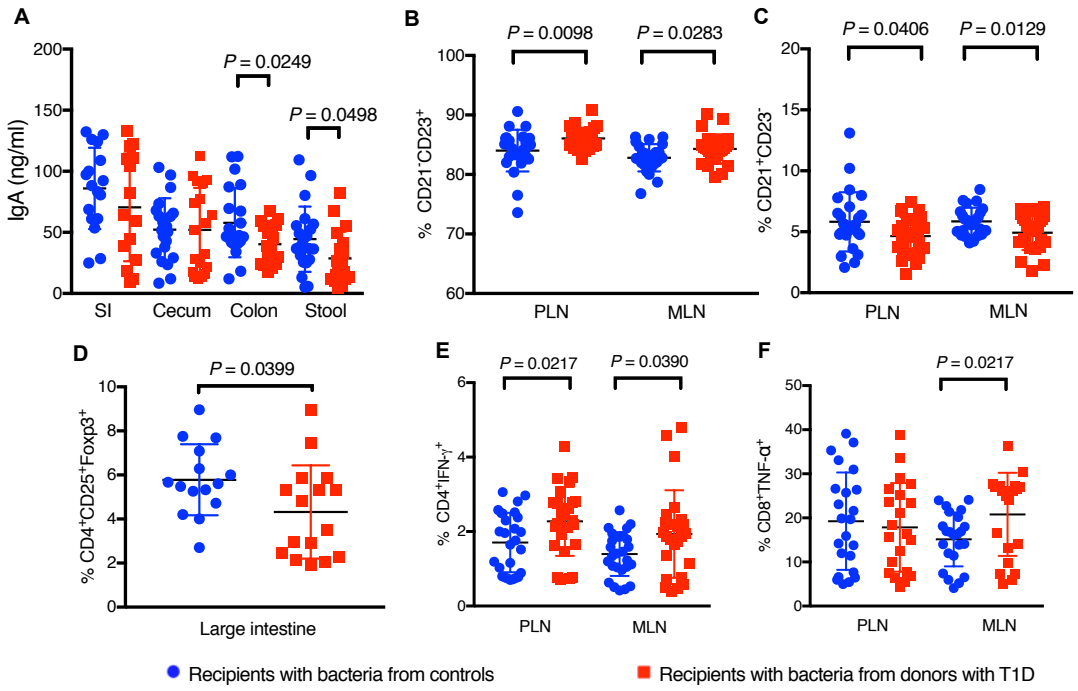


Figure S4. Role of gut microbiota from patients with T1D and control subjects in modulating immune response in germ-free (GF) NOD mice. (**A**) IgA concentrations from the content of small intestine (SI), cecum, colon and stool (n = 15-21). (**B**) $CD21^{-}CD23^{+}$ B cell and (**C**) $CD21^{+}CD23^{-}$ B cell proportions in PLN and MLN (n = 25-27). (**D**) Treg ($CD4^{+}CD25^{+}$ $Foxp3^{+}$) frequency in the large intestinal lamina propria (n = 15-16). (**E**) $CD4^{+}IFN\text{-}\gamma^{+}$ T cell frequency (n = 25-27). (**F**) $CD8^{+}TNF\text{-}\alpha^{+}$ T cell frequency (n = 21-23). Data combined from two or more independent experiments are presented as mean ± SEM and were performed by a two-tailed Student's t-test. PLN, pancreatic lymph node; MLN, mesenteric lymph node.

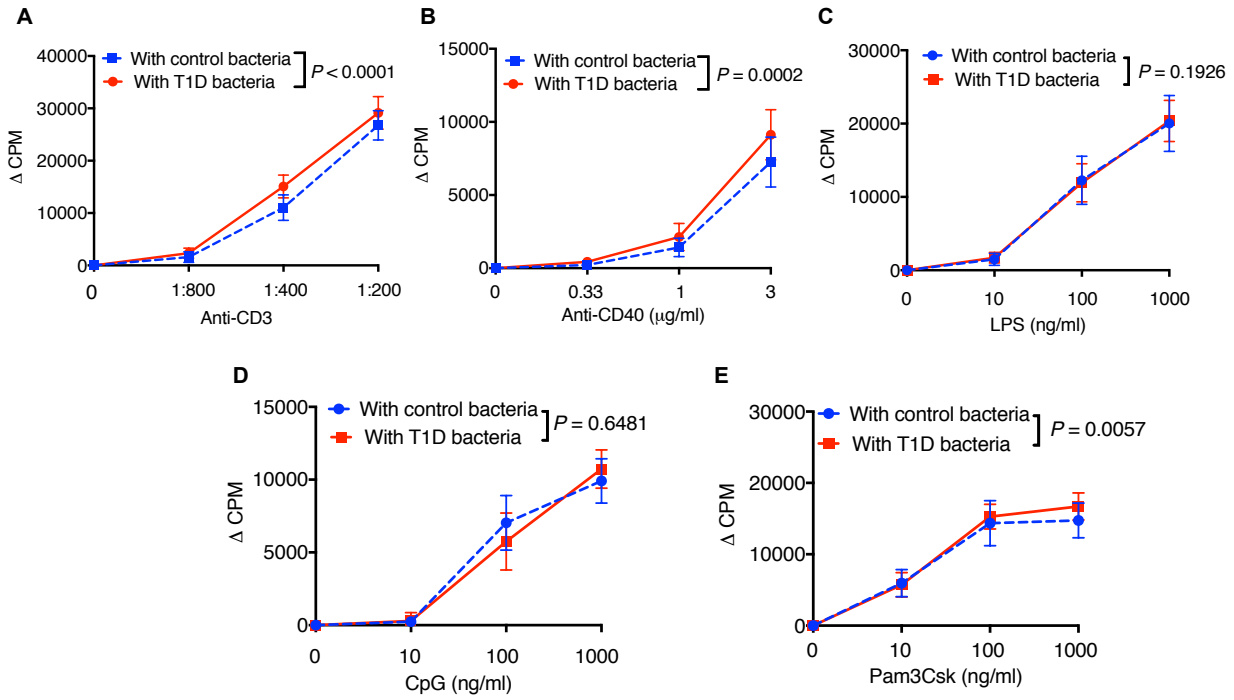


Figure S5. Immune cell function in germ-free (GF) NOD mice post-colonization. (**A-E**) Splenocytes (5×10^4 cells/well) were cultured with different concentrations of anti-CD3 (A), anti-CD40 (B), LPS (C), CpG (D), or Pam3Csk (E) for 48 hours, prior to ^{3}H-thymidine addition for a further 18 hours. Background (cells without stimulation) counts per minute (CPM) was subtracted from all data points with stimulation. Data shown are from one representative experiment and the experiments were repeated 7 times, each with consistent results. Data were analyzed using a two-way ANOVA.

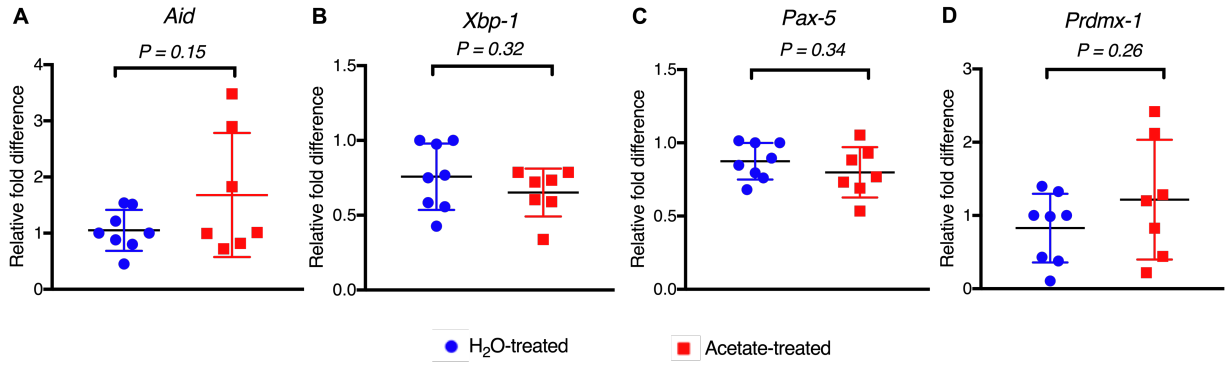


Figure S6. Gene expression of transcription factors in B cells after acetate stimulation. (**A**) *Aid*. (**B**) *Xbp-1*. (**C**) *Pax-5*. (**D**) *Prdmx-1.* Data combined from two independent experiments are presented as mean ± SEM (*n* = 7-8), and were assessed for statistical significance using a two-tailed Student's *t*-test.

Tables

Table S1. Information of donors of stool bacteria gavaged to germ-free (GF) NOD

Pairs		Age (years)	Gender	T1D duration
Pair 1	Patient 1	6	Male	5 days
	Control 1	8	Male	-
Pair 2	Patient 2	8	Female	10 months
	Control 2	9	Female	-
Pair 3	Patient 3	11	Female	12 months
	Control 3	12	Female	-
Pair 4	Patient 4	7	Male	15 days
	Control 4	10	Male	-

Table S2. Primer information

Genes	Primers	Sequence
reg3β	Forward	5′- CTGCCTTAGACCGTGCTTTC-3′
	Reverse	5′-CCCTTGTCCATGATGCTCTT-3′
reg3γ	Forward	5′-TTCCTGTCCTCCATGATCAAAA
	Reverse	5′-CATCCACCTCTGTTGGGTTCA
defcr6	Forward	5′-CAGGCTGTGTCTGTCTCTTTTG-3′
	Reverse	5′-TAAATGACCCTTTCTGCAGGTC
relmβ	Forward	5′-AGCTCTCAGTCGTCAAGAGCCTAA-3′
	Reverse	5′-CACAAGCACATCCAGTGACAACCA-3′
β-defensin14	Forward	5′-GTATTCCTCATCTTGTTCTTGG-3′
	Reverse	5′-AAGTACAGCACACCGGCCAC-3′
pIgR	Forward	5′-TCAGTCCAGCACCATAGCTG-3′
	Reverse	5′-GAACGCCTCACACTCTCTCC-3′
pstα	Forward	5′-CAGCTGTATTTGTTTGTTCTTTAGTA-3′
	Reverse	5′-CATCCCGAAACACATATACTCAC-3′
aid	Forward	5′-CCTCCTGCTCACTGGACTTC-3′
	Reverse	5′-GAAATGCATCTCGCAAGTCA-3′
pax5	Forward	5′-GAGTCTGTGACAATGACACTGTGC-3′
	Reverse	5′-AGCCTGTAGACACTATGCTGTGAC-3′
xbp-1	Forward	5′-TCCGCAGCACTCAGACTATG-3′
	Reverse	5′-ACAGGGTCCAACTTGTCCAG-3′
prdm-1	Forward	5′-GACAGAGGCCGAGTTTGAAG-3′

	Reverse	5′-TCCGCCAAAAATACTTCCTG-3′
pst2β	Forward	5′-GGCTGAACTGGGACAAGGTA-3′
	Reverse	5′-CCCATCTCAGCCCAGTTTAT-3′
stat5b	Forward	5′-CATTTTCCCATTGAGGTGCG-3′
	Reverse	5′-GGGTGGCCTTAATGTTCTCC-3′
irf4	Forward	5′-GCATTGTTTAAAGGCAAGTTCC-3′
	Reverse	5′-CATCTGTGTGTCATCCAAAGT-3′
gpr41	Forward	5′-GTGACCATGGGGACAAGCTTC-3′
	Reverse	5′-CCCTGGCTGTAGGTTGCATT-3′
gpr43	Forward	5′-GGCTTCTACAGCAGCATCTA-3′
	Reverse	5′-AAGCACACCAGGAAATTAAG-3′
slc16a1	Forward	5′-TGGTTGTCTGTCTGGTTGC-3′
	Reverse	5′-CAGTGGTCGCTTCTTGTAG-3′
slc16a3	Forward	5′-AGCCCAGTGTTCCTTTGTG-3′
	Reverse	5′-ACAGCAGTTGAGCAGTAGG-3′
slc16a7	Forward	5′-TTCAACACCACCTCCAGTC-3′
	Reverse	5′-CAGCATAATAGTCCTCCCAC-3′
gapdh	Forward	5′-GGGGTCGTTGATGGCAACA-3′
	Reverse	5′-TGTAGACCATGTAGTTGAGGTCA-3′