SUPPLEMENTARY INFORMATION

Table S1. Quantities of cytokines/chemokines measured in colonic tissues.

Cytokine/chemokine[a] (sample numbers)	PBS+water (12) [b]	PBS+DSS (9)	BL23+PBS+DSS (9)	BL23+milk+DSS (9)	BL580+DSS (7)	BL180+DSS (9)	milk (9)
IL-1α	588 ± 127[c]	1014 ± 185	375 ± 103	1284 ± 506	1518 ± 436	1039 ± 188	932 ± 171
IL-1β	1174 ± 414	5231 ± 1192	4932 ± 894	5733 ± 1657	8631 ± 3212	10530 ± 2103	9207 ± 1951
IL-3	117 ± 24	109 ± 11	119 ± 33	152 ± 17	128 ± 20	107 ± 29	123 ± 23
IL-4	438 ± 113	237 ± 84	270 ± 118	407 ± 102	320 ± 71	202 ± 94	178 ± 75
IL-5	103 ± 59	80 ± 45	54 ± 25	48 ± 36	15 ± 15	90 ± 53	75 ± 35
IL-6	60 ± 20	1260 ± 440	191 ± 81	715 ± 374	310 ± 92	818 ± 439	376 ± 107
IL-10	1618 ± 414	1018 ± 240	1025 ± 336	1275 204	974 ± 199	977 ± 246	908 ± 205
IL-12(p40)	5708 ± 976	3621 ± 725	2748 ± 478	5757 ± 1042	3143 ± 498	2277 ± 435	3236 ± 660
IL-12(p70)	0	28 ± 25	200 ± 121	208 ± 125	80 ± 80	321 ± 259	279 ± 212
IL-13	1080 ± 510	1311 ± 455	766 ± 253	693 ± 312	398 ± 191	1051 ± 352	1031 ± 210
IL-17	89 ± 45	513 ± 189	148 ± 86	367 ± 166	33 ± 33	491 ± 220	899 ± 324
Eotaxin	320281 ± 81142	172280 ± 63089	201510 ± 95939	282858 ± 74456	215750 ± 45334	124084 ± 61550	113462 ± 47191
G-CSF	866 ± 402	4088 ± 1911	853 ± 253	1936 ± 565	3712 ± 2321	1913 ± 1019	2080 ± 683

IFN-γ	350 ± 136	369 ± 134	353 ± 140	286 ± 89	260 ± 66	403 ± 125	492 ± 102
KC	711 ± 99	11534 ± 1874	5129 ± 743	6273 ± 1390	5984 ± 1120	8793 ± 2885	7316 ± 1079
MCP-1	4442 ± 928	15740 ± 2758	7431 ± 1464	12331 ± 2543	8163 ± 1482	12229 ± 4254	8649 ± 1561
MIP-1α	260 ± 134	4295 ± 417	2863 ± 578	4367 ± 1207	4729 ± 1570	3418 ± 927	4042 ± 799
MIP-1β	2772 ± 472	1928 ± 232	1746 ± 288	1908 ± 188	1186 ± 326	1873 ± 470	1927 ± 332
RANTES	2994 ± 729	3132 ± 939	4155 ± 1587	3401 ± 668	3974 ± 1724	2481 ± 528	3991 ± 1978

[a] IL-2, IL-9, TNF-α, and GM-CSF were measured but were out of range for quantification.

[b] The number of mice used for each analysis is indicated in parentheses. A total of three DSS-treated control mice and two mice fed BL580 in milk were excluded from cytokine/chemokine quantification because of sacrifice before the end of the study.

[c] The avg ± ste of cytokine quantities is shown.

Table S2. Correlation analysis between phylotypes, DAI, and % body weight loss.

Family	DAI		% Body weight lost	
	Correlation coefficient	P value	Correlation coefficient	P value
Unclassified *Bacilli*	0.47	0.00	0.39	0.00
Enterobacteriaceae	0.45	0.00	0.34	0.01
Unclassified *Gammaproteobacteria*	0.41	0.00	0.32	0.01
Porphyromonadaceae	0.36	0.00	0.36	0.00
Enterococcaceae	0.27	0.03	0.24	0.05
Alcaligenaceae	0.25	0.04	0.11	0.39
Unclassified *Bacteria*	-0.26	0.04	-0.18	0.15
Bifidobacteriaceae	-0.27	0.03	-0.25	0.04
Rikenellaceae	-0.27	0.03	-0.25	0.05
Unclassified *Bacteroidales*	-0.28	0.02	-0.24	0.05
Undefined RF32	-0.29	0.02	-0.16	0.21
Clostridiaceae	-0.16	0.19	-0.25	0.05
Lachnospiraceae	-0.31	0.01	-0.31	0.01
[Odoribacteraceae]	-0.32	0.01	-0.15	0.25
Undefined *Clostridiales*	-0.34	0.01	-0.32	0.01
S24-7	-0.37	0.00	-0.30	0.02
Peptococcaceae	-0.43	0.00	-0.34	0.01
Unclassified *Clostridiales*	-0.43	0.00	-0.33	0.01
Desulfovibrionaceae	-0.45	0.00	-0.36	0.00
Ruminococcaceae	-0.46	0.00	-0.40	0.00

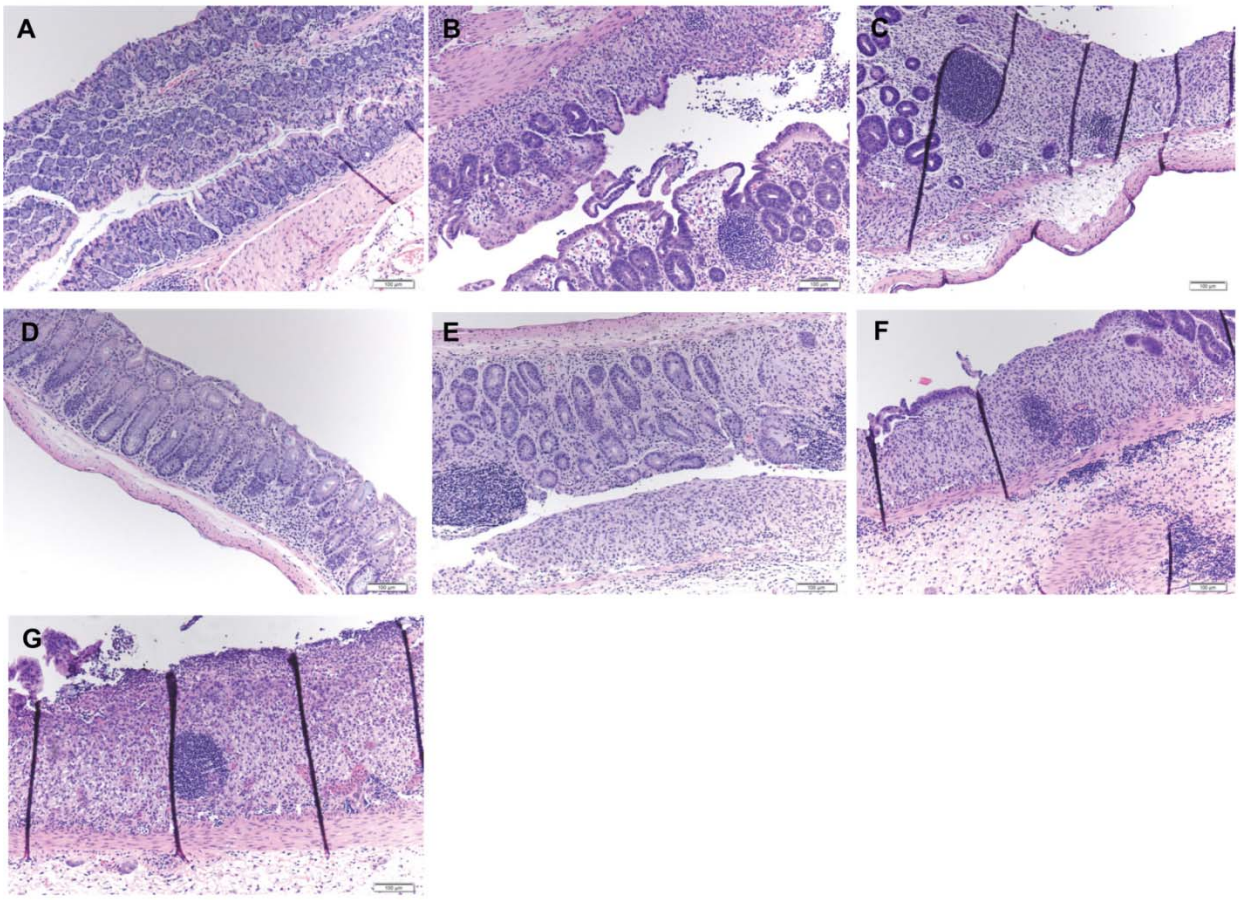

Figure S1. Histology of the distal colon. Mice were fed (A) PBS (sham-treated), or 2 to 3% DSS in their drinking water and oral supplements of (B) PBS, (C) *L. casei* BL23 in PBS, (D) BL23+milk, (E) BL580+milk, (F) BL180+milk, or (G) acidified milk. (A) has an intact mucosa and no significant inflammatory infiltrate (Score = 0); (D) has an intact mucosa with inflammation in mucosa and submucosa (Score = 4); (E) has extensive ulceration with inflammation in mucosa and submucosa, but not transmural (Score = 7); (B, C, F, and G) have extensive ulceration and transmural inflammation (Score = 9); Hematoxylin and Eosin, Bar = 100μM.

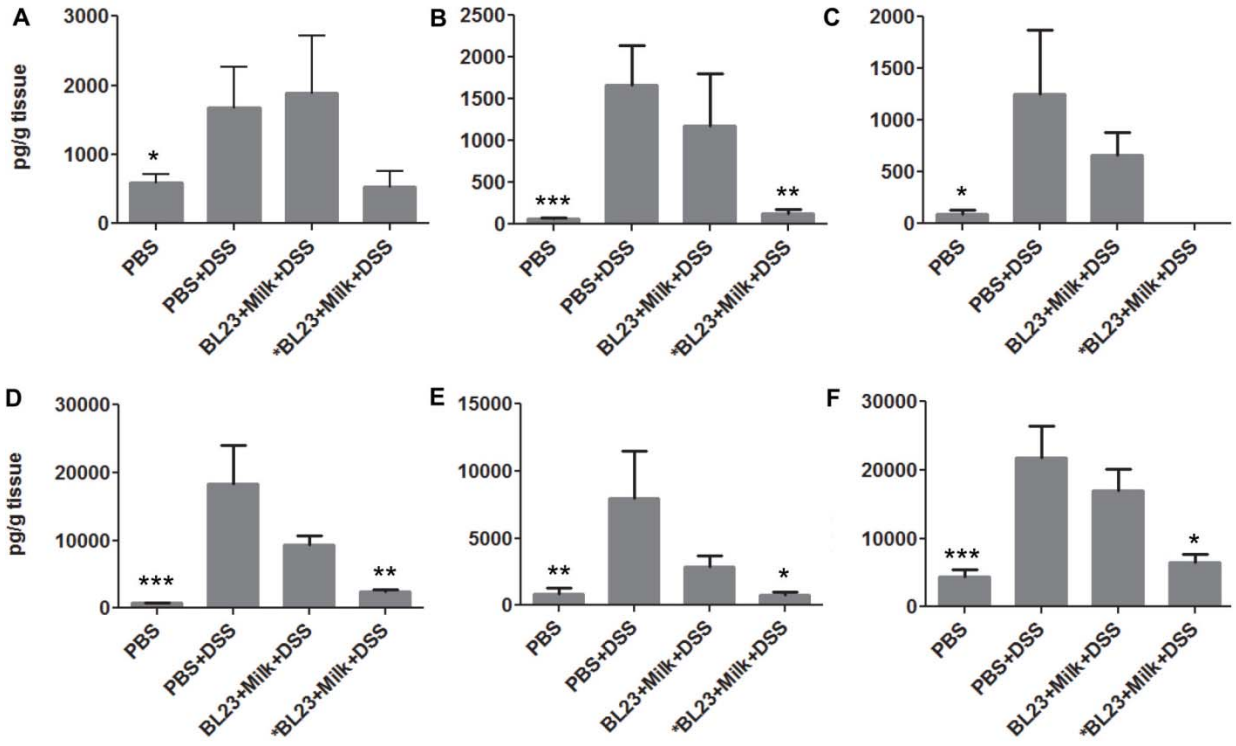

Figure S2. Colonic cytokine levels differed between mice fed *L. casei* BL23 in milk. The quantities of (A) IL-1α, (B) IL-6, (C) IL-17, (D) Keratinocyte-derived chemokine KC, (E) G-CSF, and (F) MCP-1 were measured. The average ± ste for twelve (PBS, healthy sham), five (BL23+milk+DSS), or four (*BL23+milk+DSS) mice fed *L. casei* in milk individual mice is shown. *BL23+milk+DSS indicates the four mice clustered with PBS (no DSS) fed mice in the result of PCA in **Figure 4**. *: $p< 0.05$, **: $p<0.01$, ***: $p<0.001$ according to the Mann-Whitney U Test compared to DSS control group.

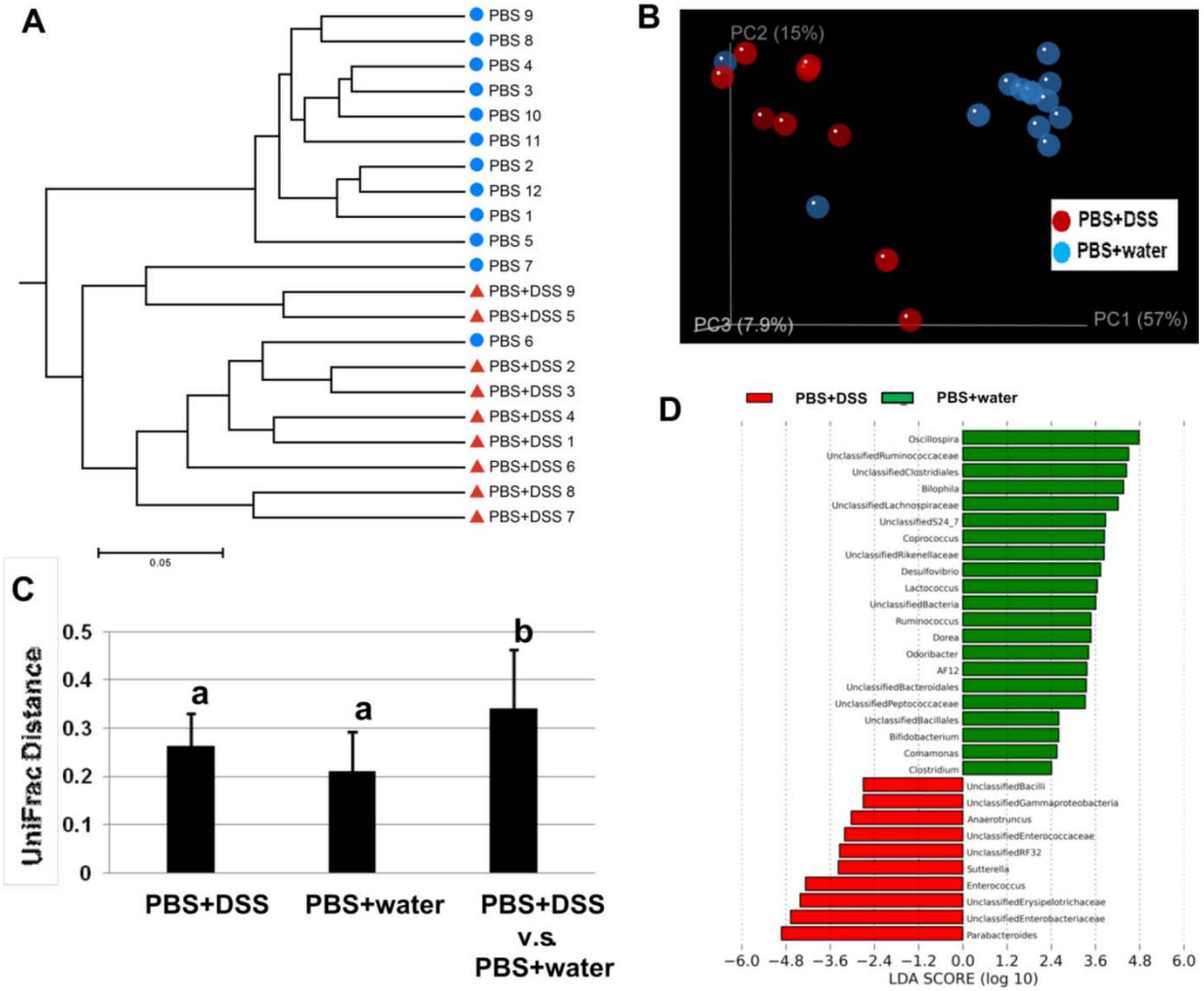

Figure S3. Differences in gut microbiota structure between DSS-treated mice and the healthy controls. (A) Cluster analysis based on the UniFrac distance of the microbiota in the ceca of DSS and healthy control mice. (B) Weighted UniFrac PCoA analysis of the gut microbiota structure. (C) UniFrac distance within and between groups. Statistical significance according to the Bonferroni-corrected P value <0.01 of the Student *t* test is indicated. (D) LDA score histogram of key phylotypes differently abundant in DSS- and healthy control mice.

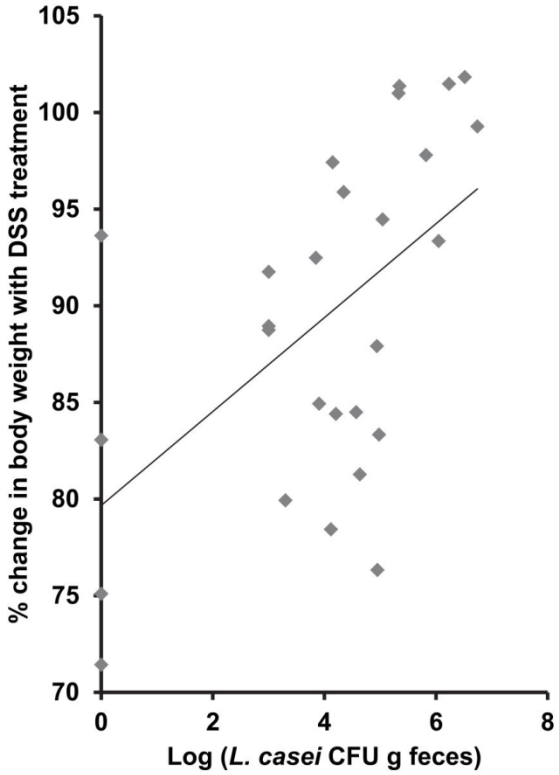

Figure S4. Correlation between *L. casei* cell viability and mouse body weight. The % change in mouse body weight at the time of necropsy was compared to body weight on prior to DSS initiation. All *L. casei* BL23, BL580, and BL180 fed mice were included except for one mouse fed *L. casei* BL23 in milk, three mice fed *L. casei* BL23 in PBS, and two mice fed *L. casei* BL580 in milk because of diarrhea or early termination point (R^2=0.33).