Supplementary Table 1. Experimental diets and fatty acid composition

Study Diets	Low-fat (AIN-93M)	Saturated-Milk Fat	Saturated-Lard Fat	PUFA (Safflower oil)
Fat (%kcal)	5	38	38	38
-Saturated (%total)	0.6	*65*	*39*	*9*
-PUFA	3.9	*3.5*	*11*	*78*
Protein	19	16	16	16
Carbohydrate	66	47	47	47
Micronutrients/Fiber	*ND	*ND	*ND	*ND

		Milk Fat	Lard	Safflower Oil
4:0	Butyric	3.8		
6:0	Caproic	2.3		
8:0	Caprylic	1.1		
10:0	Capric	2		
11:0		0.1		
12:0	Lauric	3.1		
14:0	Myristic	11.7	1.5	
14:1		0.8		
15:0		1.6		
15:1		0		
16:0	Palmitic	26.2	24.8	6.5
16:1	Palmitoleic	1.9	3.1	
17:0	Margaric	0.7		
17:1		0.2		
18:0	Stearic	12.5	12.3	2.4
18:1	Oleic	28.2	45.1	13.1
18:2	Linoleic	2.9	10	78
18:3	Linolenic	0.5	0.1	
18:4		0		
20:0	Arachidic	0	0.2	
20:1		0.2	1.3	
20:2		0	0.1	
20:3				
20:4	Arachidonic	0.1	0.4	
20:5	EPA			
21:5		0		
22:1		0		
22:4				
22:5	DPA	0		
22:6	DHA	0		

Supplementary Table 2. Assignment to the genus level of 324 near full-length 16s rRNA sequences

	Low-fat	PUFA	MF
Genus			
Bacteroides	8	31	34
Tannerella	1	1	2
Parabacteroides	5	48	39
Allobaculum	20	20	7
Anaerotruncus	10	2	2
Clostridium	25	3	
Peptostreptococcaceae Incertae Sedis	2	1	4
Lachnospiraceae Incertae Sedis	10	1	10
Erysipelotrichaceae Incertae Sedis	24	1	
Bilophila			6
Lactobacillus			5
Alistipes			3
Papillobacter	2	1	1
Sum	107	109	111

Supplementary Table 3. Sample metadata

	Clone Library	454-Pyrosequencing
Sequencing depths and # reads	• 3525 average total sequences • 110 sequences/sample	• 3000 reads/sample
Total Mice	32	38
C57BL/6	10	23
IL10$^{-/-}$	22	15

Supplementary Table 4. Correlation between abundance of *B. wadsworthia* and colitis score calculated by Pearsons correlation coefficient

	Correlation of Bw abundance and colitis score (R-value)
Diet treatment groups	
SPF IL10$^{-/-}$ + LF	0.36
SPF IL10$^{-/-}$ + PUFA	0.26
SPF IL10$^{-/-}$ + MF	0.92
GF IL10$^{-/-}$ + LF	-
GF IL10$^{-/-}$ + PUFA	-
GF IL10$^{-/-}$ + MF	0.94
Bile treatment groups	
SPF IL10$^{-/-}$ + PBS	0.27
SPF IL10$^{-/-}$ + GC	0.54
SPF IL10$^{-/-}$ + TC	0.96
GF IL10$^{-/-}$ + PBS	-
GF IL10$^{-/-}$ + GC	-
GF IL10$^{-/-}$ + TC	0.95