Supplementary Materials

Table S1 Levels of cytokines and chemokines in ACC compared among SPF, GF-PBS and GF-*R.h* rats (Mean ± SD) (pg/mL).

	SPF (n=6)	GF-PBS (n=6)	GF-*R.h* (n=6)	P value
IL-1α	15.24 ± 2.44	10.10 ±0.74	7.189 ±1.38	$<0.001^*$ $<0.001^\#$ $0.022^\$$
IL-6	94.86 ± 13.73	69.16 ± 25.29	67.06 ± 32.31	n.s.
IL-12	13.12 ± 2.52	12.05 ± 3.61	11.03 ± 3.40	n.s.
TNF-α	114.60 ± 11.01	111.80 ± 26.25	128.60 ± 24.12	n.s.
IFN-γ	130.63 ± 24.89	148.79 ± 49.13	78.40 ± 32.05	$0.012^\$$
MCP-1	60.64 ± 13.64	63.12 ± 10.38	45.01 ± 6.77	$0.025^\$$

One-way ANOVA. *, SPF vs. GF-PBS; #, SPF vs.GF-*R.h*; $, GF-PBS vs.GF-*R.h.*

Table S2 Levels of cytokines and chemokines in hippocampus compared among SPF, GF-PBS and GF-*R.h* rats (Mean ± SD) (pg/mL).

	SPF (n=6)	GF-PBS (n=6)	GF-*R.h* (n=6)	P value
IL-1α	35.48 ± 15.81	56.72 ± 13.17	29.54 ± 15.09	$0.016^\$$
IL-6	181.23 ± 58.70	286.28 ± 75.52	162.61 ± 56.59	0.036^* $0.012^\$$
IL-12	28.56 ± 8.41	42.33 ± 10.97	26.36 ± 8.90	$0.027^\$$
TNF-α	124.42 ± 19.24	179.80 ± 13.26	153.41 ± 10.90	$<0.001^*$ $0.011^\#$ $0.020^\$$
IFN-γ	255.80 ± 65.14	359.10 ± 64.39	224.60 ± 93.78	$0.020^\$$
MCP-1	93.80 ± 23.27	124.10 ± 9.90	98.98 ± 9.23	0.011^* $0.034^\$$

One-way ANOVA. *, SPF vs. GF-PBS; #, SPF vs.GF-*R.h*; $, GF-PBS vs.GF-*R.h.*

Table S3 Serum concentration of SCFAs compared among SPF, GF-PBS and GF-*R.h*

rats. (Mean ± SD) (μg/mL).

	SPF	GF-PBS	GF-*R.h*	*P* value
Acetate	19.09 ± 7.55	10.13 ± 0.86	9.47 ± 1.26	0.008[*] 0.005[#]
Propionate	0.77 ± 0.46	0.18 ± 0.059	0.27 ± 0.059	0.004[*] 0.016[#]
Buterate	0.70 ± 0.35	0.13 ± 0.017	0.17 ± 0.024	<0.001[*] 0.001[#]
Isobutyrate	0.20 ± 0.088	0.044 ± 0.016	0.070 ± 0.031	<0.001[*] 0.003[#]
Valerate	0.073 ± 0.027	0.053 ± 0.015	0.070 ± 0.013	n.s.
Isovalerate	0.055 ± 0.030	0.031 ± 0.007	0.042 ± 0.009	n.s.

One-way ANOVA. *, SPF vs. GF-PBS; #, SPF vs.GF-*R.h*; $, GF-PBS vs.GF-*R.h.*

**Table S4** Levels of cytokines and chemokines in ACC compared among GF, GF-Pro and GF-But rats (Mean ± SD) (pg/mL).

	GF (n=7)	GF-Pro (n=7)	GF-But (n=7)	P value
IL-1α	9.80 ± 6.98	3.01 ± 3.31	5.02 ± 5.36	n.s.
IL-6	82.49 ± 44.61	32.34 ± 19.48	55.24 ± 42.98	0.045[*]
IL-12	12.05 ± 4.17	7.78 ± 2.33	7.89 ± 2.90	n.s.
TNF-α	116.80 ± 13.75	114.60 ± 6.078	114.30 ± 20.94	n.s.
IFN-γ	122.30 ± 62.72	62.67 ± 32.60	85.97 ± 22.45	0.044[*]
MCP-1	56.05 ± 17.89	33.16 ± 7.33	37.87 ± 9.52	0.007[*] 0.034[#]

One-way ANOVA. GF-Pro, GF-propionate; GF-But, GF-butyrate. *, GF vs. GF-Pro; #, GF vs. GF-But; $, GF-Pro vs. GF-But.

Table S5 Levels of cytokines and chemokines in hippocampus compared among GF, GF-Pro and GF-But rats (Mean ± SD) (pg/mL).

	GF (n=7)	GF-Pro (n=6)	GF-But (n=6)	P value
IL-1α	53.25 ± 18.59	4.24 ± 1.08	5.53 ± 3.64	<0.001[*] <0.001[#]
IL-6	267.30 ± 63.26	41.85 ± 9.20	46.54 ± 22.83	<0.001[*] <0.001[#]
IL-12	39.13 ± 8.47	11.35 ± 1.71	11.89 ± 3.52	<0.001[*] <0.001[#]
TNF-α	177.70 ± 32.33	128.90 ± 31.06	89.45 ± 13.22	0.014[*] <0.001[#]
IFN-γ	359.10 ± 72.88	71.11 ± 13.80	85.88 ± 33.68	<0.001[*] <0.001[#]
MCP-1	124.07 ± 33.07	49.15 ± 5.89	46.23 ± 8.97	<0.001[*] <0.001[#]

One-way ANOVA. GF-Pro, GF-propionate; GF-But, GF-butyrate. *, GF vs. GF-Pro; #, GF vs. GF-But; $, GF-Pro vs. GF-But.
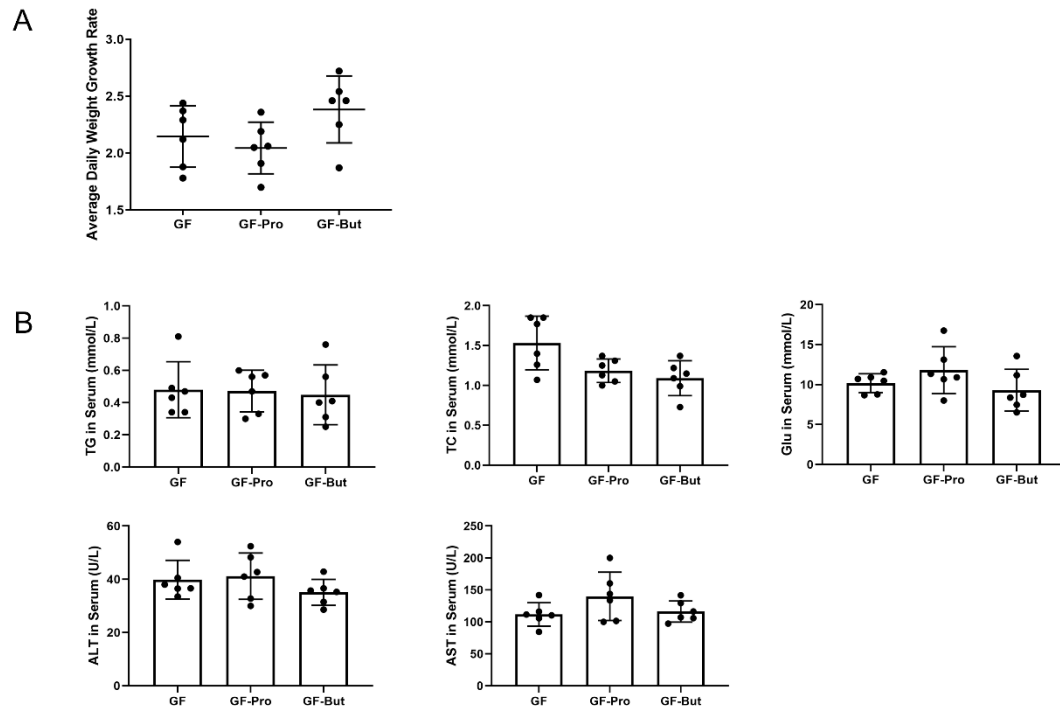
Figure S1. Effects of propionate and butyrate on body weight and metabolic parameters.

A. Average daily weight growth rate among GF, GF-Pro, and GF-But rats. **B.** Metabolic parameters (triglyceride, total cholesterol, glucose, alanine aminotransferase, and aspartate aminotransferase) in serum were determined using automatic biochemical analyzer (Mindray, Shenzhen, China) after 7 days gavage. Statistical analysis was performed by Kruskal-Wallis-test for non-parametric data with a Dunn's post-test. n=6. TG, triglyceride; TC, total cholesterol; Glu, glucose; ALT, alanine aminotransferase; AST, aspartate aminotransferase.