

# Supplementary Materials

## 1. Preliminary screening of lactobacillus strain inhibiting *Porphyromonas gingivalis*

Oxford cup drilling method was used to screen probiotics for inhibiting *Porphyromonas gingivalis*. 200  $\mu$ L  $1 \times 10^7$  CFU/mL *Porphyromonas gingivalis* was evenly spread on Columbia blood agar plate, and 4 holes were drilled on the agar with Oxford cup. 100  $\mu$ L MRS liquid medium (as a control group) and lactobacillus with different concentrations ( $1 \times 10^8$  CFU/mL,  $1 \times 10^7$  CFU/mL,  $1 \times 10^6$  CFU/mL) were added to holes, respectively. After the liquid was absorbed by solid medium, the plate was inverted in a 37°C incubator for 48 h. Use vernier calipers to measure the diameter of the bacteriostatic zone under the concentrations of  $1 \times 10^8$  CFU/mL.

**Table S1.** Antibacterial circle diameter of lactobacillus to *Porphyromonas gingivalis*.

Strain	Inhibition zone (mm)	Strain	Inhibition zone (mm)
<i>Leuconostoc mesenteroides</i> LVBH101	14.7	<i>Lactobacillus sakei</i> MS101	-
<i>Leuconostoc mesenteroides</i> LVBH107	28.9	<i>Lactobacillus sakei</i> MS107	16.9
<i>Leuconostoc mesenteroides</i> LVBH108	16.9	<i>Lactobacillus sakei</i> MS108	14.5
<i>Lactobacillus curvatus</i> LUA101	24.1	<i>Lactobacillus sakei</i> MS109	-
<i>Lactobacillus curvatus</i> LUA102	14.3	<i>Lactobacillus sakei</i> MS201	16.8
<i>Lactobacillus curvatus</i> LUA103	-	<i>Weissella cibaria</i> BSH507	17.4
<i>Lactobacillus curvatus</i> LUA104	-	<i>Weissella cibaria</i> BSH509	-
<i>Lactobacillus curvatus</i> LUA105	13.6	<i>Weissella cibaria</i> BSH510	19.4
<i>Lactobacillus curvatus</i> LUA206	18.9	<i>Weissella cibaria</i> CBN101	22.1
<i>Lactobacillus curvatus</i> LUA207	15.8	<i>Weissella cibaria</i> CBN102	20.5
<i>Pediococcus pentosaceus</i> BSF203	-	<i>Weissella cibaria</i> CBN203	20.4
<i>Pediococcus pentosaceus</i> BSF204	-	<i>Weissella cibaria</i> CBK101	19.8
<i>Pediococcus pentosaceus</i> BSF206	21.6	<i>Weissella cibaria</i> CBK102	16.4
<i>Pediococcus pentosaceus</i> BSF207	-	<i>Weissella cibaria</i> CBK103	22.4
<i>Pediococcus pentosaceus</i> BSF208	16.5	<i>Weissella cibaria</i> CBK104	19.4
<i>Pediococcus pentosaceus</i> AC1-1	17.8	<i>Lactobacillus plantarum</i> K203	18.9
<i>Pediococcus pentosaceus</i> AC1-2	21.7	<i>Lactobacillus plantarum</i> K204	-
<i>Pediococcus pentosaceus</i> AC2-1	16.4	<i>Lactobacillus plantarum</i> K205	17.8
<i>Pediococcus pentosaceus</i> AC2-2	22.1	<i>Lactobacillus plantarum</i> K206	18.9
<i>Pediococcus pentosaceus</i> AC2-3	22.9	<i>Lactobacillus plantarum</i> K207	14.8
<i>Lactobacillus sakei</i> BSA103	14.1	<i>Lactobacillus plantarum</i> K208	19.0
<i>Lactobacillus sakei</i> BSA206	20.9	<i>Lactobacillus plantarum</i> H102	-
<i>Lactobacillus sakei</i> MS103	16.8	<i>Lactobacillus plantarum</i> H103	-
<i>Lactobacillus sakei</i> MS104	23.7	<i>Lactobacillus plantarum</i> H104	20.9
<i>Lactobacillus sakei</i> MS105	16.5	<i>Lactobacillus plantarum</i> H105	16.9

## 2. Relevant experimental data and *p* values

**Table S2.** Effect of *L. mesenteroides* LVBH107 on the cell viability of RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3	<i>p</i> 4
Control	100.00 $\pm$ 7.32				
7 Log-L LVBH107	126.50 $\pm$ 16.34	0.011	0.288		
7 Log-HK LVBH107	116.50 $\pm$ 10.16	0.090	0.288		
8 Log-L LVBH107	116.74 $\pm$ 10.07	0.086		0.173	
8 Log-HK LVBH107	103.71 $\pm$ 13.14	0.689		0.173	
9 Log-L LVBH107	87.08 $\pm$ 13.39	0.176			0.220
9 Log-HK LVBH107	75.44 $\pm$ 6.26	0.017			0.220

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group, *p*4 is the *p* value compared with 9-L LVBH107 or 9-HK LVBH107 group.

**Table S3.** Effect of *L. mesenteroides* LVBH107 on TNF- $\alpha$  in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	126.89 $\pm$ 11.64	0.000		
Model	962.53 $\pm$ 64.23			
7 Log-L LVBH107	565.88 $\pm$ 76.67	0.000	0.220	
7 Log-HK LVBH107	629.24 $\pm$ 49.35	0.000	0.220	
8 Log-L LVBH107	735.07 $\pm$ 36.64	0.001		0.595
8 Log-HK LVBH107	761.81 $\pm$ 87.46	0.001		0.595

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S4.** Effect of *L. mesenteroides* LVBH107 on IL-6 in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	11.35 $\pm$ 3.21	0.000		
Model	298.89 $\pm$ 13.43			
7 Log-L LVBH107	176.38 $\pm$ 18.18	0.000	0.000	
7 Log-HK LVBH107	241.48 $\pm$ 19.13	0.010	0.000	
8 Log-L LVBH107	196.18 $\pm$ 20.67	0.000		0.000
8 Log-HK LVBH107	287.9 $\pm$ 18.40	0.433		0.000

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S5.** Effect of *L. mesenteroides* LVBH107 on IL-1 $\beta$  in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	9.06 $\pm$ 1.95	0.000		
Model	130.64 $\pm$ 10.61			
7 Log-L LVBH107	79.4 $\pm$ 8.67	0.000	0.019	
7 Log-HK LVBH107	100.22 $\pm$ 9.58	0.002	0.019	
8 Log-L LVBH107	92.75 $\pm$ 7.26	0.000		0.003
8 Log-HK LVBH107	120.88 $\pm$ 14.01	0.228		0.003

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S6.** Effect of *L. mesenteroides* LVBH107 on NO in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	18.77 $\pm$ 2.25	0.000		
Model	63.87 $\pm$ 4.26			
7 Log-L LVBH107	46.22 $\pm$ 3.29	0.000	0.003	
7 Log-HK LVBH107	58.21 $\pm$ 5.33	0.111	0.003	
8 Log-L LVBH107	52.28 $\pm$ 4.67	0.040		0.030
8 Log-HK LVBH107	60.37 $\pm$ 3.60	0.309		0.030

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S7.** Effect of *L. mesenteroides* LVBH107 on PGE2 in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	19.63 $\pm$ 1.00	0.000		
Model	42.39 $\pm$ 3.43			
7 Log-L LVBH107	36.24 $\pm$ 2.88	0.070	0.810	
7 Log-HK LVBH107	39.82 $\pm$ 1.15	0.196	0.810	
8 Log-L LVBH107	38.6 $\pm$ 1.96	0.067		0.111
8 Log-HK LVBH107	41.82 $\pm$ 2.35	0.769		0.111

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S8.** Effect of *L. mesenteroides* LVBH107 on TNF- $\alpha$  mRNA expression in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	0.04 $\pm$ 0.01	0.000		
Model	1.00 $\pm$ 0.10			
7 Log-L LVBH107	0.64 $\pm$ 0.11	0.000	0.001	
7 Log-HK LVBH107	0.93 $\pm$ 0.09	0.264	0.001	
8 Log-L LVBH107	0.89 $\pm$ 0.08	0.101		0.240
8 Log-HK LVBH107	0.97 $\pm$ 0.09	0.601		0.240

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S9.** Effect of *L. mesenteroides* LVBH107 on IL-6 mRNA expression in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	0.09 $\pm$ 0.01	0.000		
Model	1.00 $\pm$ 0.14			
7 Log-L LVBH107	0.54 $\pm$ 0.11	0.000	0.010	
7 Log-HK LVBH107	0.85 $\pm$ 0.09	0.048	0.010	
8 Log-L LVBH107	0.77 $\pm$ 0.09	0.060		0.015
8 Log-HK LVBH107	0.97 $\pm$ 0.13	0.633		0.015

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S10.** Effect of *L. mesenteroides* LVBH107 on IL-1 $\beta$  mRNA expression in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	0.03 $\pm$ 0.01	0.000		
Model	1.00 $\pm$ 0.13			
7 Log-L LVBH107	0.86 $\pm$ 0.08	0.028	0.048	
7 Log-HK LVBH107	0.98 $\pm$ 0.11	0.775	0.048	
8 Log-L LVBH107	0.93 $\pm$ 0.05	0.251		0.358
8 Log-HK LVBH107	41.82 $\pm$ 2.35	0.769		0.358

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S11.** Effect of *L. mesenteroides* LVBH107 on COX-2 mRNA expression in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	0.06 $\pm$ 0.01	0.000		
Model	1.00 $\pm$ 0.07			
7 Log-L LVBH107	0.63 $\pm$ 0.04	0.000	0.000	
7 Log-HK LVBH107	0.93 $\pm$ 0.08	0.097	0.000	
8 Log-L LVBH107	0.85 $\pm$ 0.06	0.020		0.013
8 Log-HK LVBH107	0.96 $\pm$ 0.05	0.364		0.013

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.

**Table S12.** Effect of *L. mesenteroides* LVBH107 on *i*NOS mRNA expression in RAW264.7 cells.

Group	mean $\pm$ standard deviation	<i>p</i> 1	<i>p</i> 2	<i>p</i> 3
Control	0.11 $\pm$ 0.03	0.000		
Model	1.00 $\pm$ 0.07			
7 Log-L LVBH107	0.79 $\pm$ 0.06	0.001	0.010	
7 Log-HK LVBH107	0.93 $\pm$ 0.08	0.146	0.010	
8 Log-L LVBH107	0.86 $\pm$ 0.07	0.010		0.014
8 Log-HK LVBH107	0.99 $\pm$ 0.051	0.855		0.014

*p*1 is the *p* value compared with the control group, *p*2 is the *p* value compared with 7-L LVBH107 or 7-HK LVBH107 group, *p*3 is the *p* value compared with 8-L LVBH107 or 8-HK LVBH107 group.