

1 **Table S1** Antibodies used for immunofluorescence (IF) and immunohistochemistry
 2 staining (IHC)

Antibodies	Source species	Dilution ratio *	Supplier
Primary antibody			
Ki67	Rabbit	1:500 (IHC)	Servicebioe, GB111141
IL-6	Rabbit	1:100 (IF/IHC)	Abclonal, A0286
IL-6R α	Mouse	1:100 (IF/IHC)	Santa Cruz, sc-373708
gp130	Rabbit	1:100 (IF/IHC)	Abclonal, A14656
Secondary antibody			
Anti-rabbit IgG H&L (Alexa Fluor [®] 555)	Goat	1:1000 (IF)	Abacm, ab150078
Anti-mouse IgG H&L (Alexa Fluor [®] 647)	Goat	1:1000 (IF)	Abacm, ab150115
Anti-mouse-IgG-HRP	Goat	1:200 (IHC)	Servicebio, GB23301
Anti-rabbit-IgG-HRP	Goat	1:200 (IHC)	Servicebio, GB23303

3 *Primary antibody dilution buffer for IF, Beyotime Biotechnology (P0023A); Primary
 4 antibody dilution buffer for IHC, Servicebio (G20250); Secondary antibody dilution
 5 buffer for IF, PBST; Secondary antibody dilution buffer for IHC, PBS Solution. *IL-6*
 6 interleukin-6, *IL-6R α* interleukin-6 receptor- α

9 **Table S2** Primers and RNA oligonucleotides sequences used in this study.

Gene (human)	Forward primer (5' – 3')	Reverse primer (5' – 3')
<i>IL-6</i>	ACCTTCCAAAGATGGCTGAA	GGCTTGTTCTCACTACTCTCAA
<i>IL-6Rα</i>	ACTTGCTGGTGGATGTTCCC	AGCCTTTGTCGTCAGGGATG
si IL-6R α -593	GGAAGACAAUGCCACUGUUTT	AACAGUGGCAUUGUCUUCCTT
si IL-6R α -815	CCUCAGCAAUGUUGUUUGUTT	ACAAACAACAUUGCUGAGGTT
<i>β-actin</i>	CCACACCCGCCACCAGTTC	GACCCATTCCCACCATCACACC

10 *IL-6* interleukin-6, *IL-6R α* interleukin-6 receptor- α

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14 **Table S3** Antibodies used for Western blotting analysis

Antibodies	Source species	Dilution ratio*	Supplier
Primary antibody			
IL-6R α	Rabbit	1:1000	Santa Cruz, sc-373708
gp130	Rabbit	1:1000	Abcam, ab283685
Akt	Mouse	1:1000	Santa Cruz, sc-81434
p-Akt	Rabbit	1:2000	Santa Cruz, sc-514032
Cyclin D1	Rabbit	1:1000	Abcam, ab16663
CDK4	Mouse	1:1000	Santa Cruz, sc-23896
Bcl-2	Rabbit	1:1000	Abcam, ab196495
GAPDH	Rabbit	1:10000	Abcam, ab181602
Secondary antibody			
Anti-mouse-IgG (H + L)-HRP	Goat	1:10000	Beyotime Biotechnology, A0216
Anti-rabbit-IgG (H + L)-HRP	Goat	1:10000	Beyotime Biotechnology, A0208

15 *Primary antibody dilution buffer, Beyotime Biotechnology (P0023A); Secondary
 16 antibody dilution buffer, 1 \times TBST (Solarbio, T1081). *IL-6R α* interleukin-6 receptor- α

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19 **Table S4** Top 10 species of subgingival plaque (Sp) and prostatic fluid (Pf)

Sp		Prostatic fluid	
Top 10 species	Mean relative abundance	Top 10 species	Mean relative abundance
<i>s__Porphyromonas gingivalis</i>	33.89%	<i>s__Escherichia fergusonii</i>	13.83%
<i>s__Bacteroides fragilis</i>	26.79%	<i>s__Pseudomonas aeruginosa</i>	12.42%
<i>s__Gemella morbillorum</i>	13.03%	<i>s__Weissella hellenica</i>	11.95%
<i>s__Capnocytophaga ochracea</i>	4.10%	<i>s__Porphyromonas gingivalis</i>	7.31%
<i>s__Veillonella parvula</i>	2.88%	<i>s__Bacteroides fragilis</i>	5.38%
<i>s__Staphylococcus epidermidis</i>	1.93%	<i>s__Lactobacillus plantarum</i>	1.58%
<i>s__Weissella hellenica</i>	1.64%	<i>s__Lactobacillus leichmannii</i>	0.90%
<i>s__Granulicatella adiacens</i>	1.11%	<i>s__Streptococcus oralis</i>	0.73%
<i>s__Parvimonas micra</i>	1.11%	<i>s__Enterococcus mundtii</i>	0.65%
<i>s__Prevotella loescheii</i>	0.91%	<i>s__Gemella morbillorum</i>	0.63%

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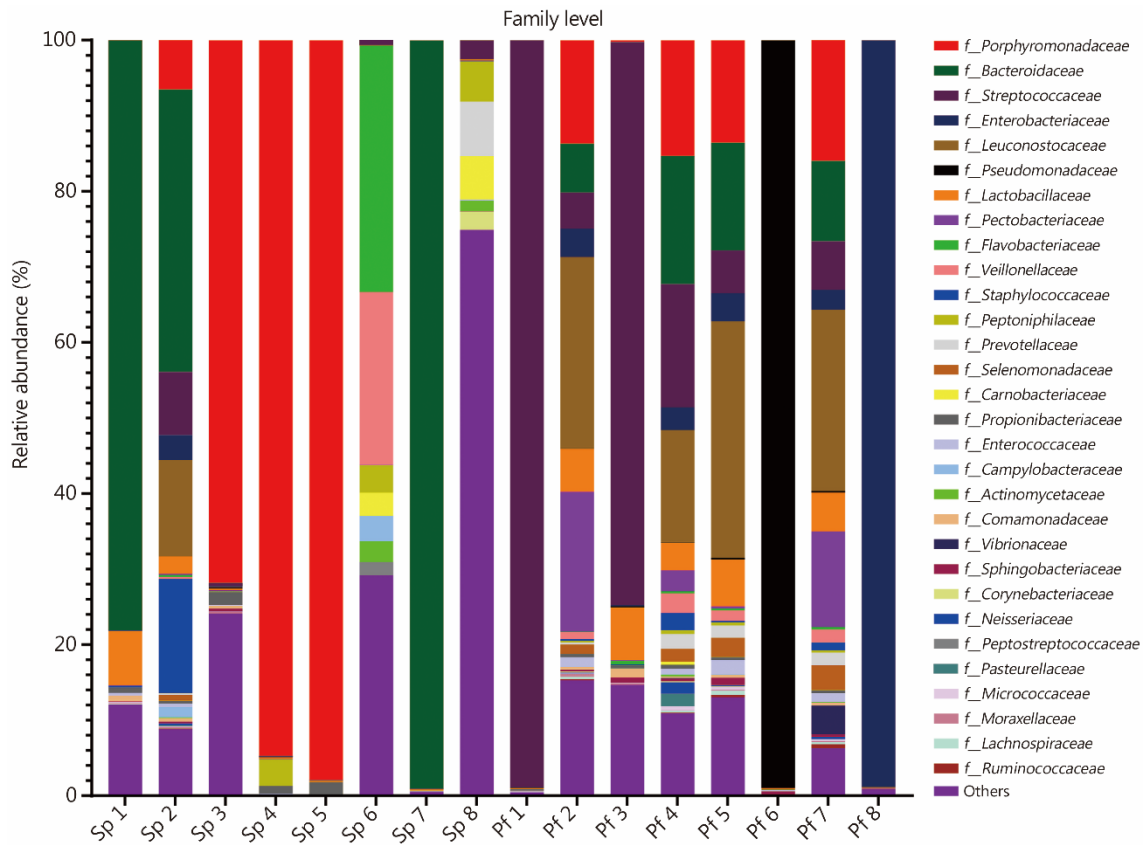
21 **Table S5** Detection of oral pathogens in subgingival plaque (Sp) and prostatic fluid (Pf)
 22 of each patient

Patients	<i>Porphyromonas gingivalis</i>		<i>Bacteroides fragilis</i>		<i>Capnocytophaga ochracea</i>		<i>Parvimonas micra</i>		<i>Streptococcus oralis</i>	
	Sp	Pf	Sp	Pf	Sp	Pf	Sp	Pf	Sp	Pf
1	-	-	+	+	-	-	-	-	-	-
2	+	+	+	+	-	+	+	+	+	-
3	+	+	-	+	+	-	-	-	-	+
4	+	+	-	+	-	+	-	+	-	+
5	+	+	-	+	-	+	-	+	-	+
6	-	-	-	+	+	+	+	-	-	-
7	+	+	+	+	-	+	-	+	-	-
8	-	-	+	+	-	+	+	-	-	-

23 “+” indicate the bacteria were detected; “-“ indicate the bacteria were not detected

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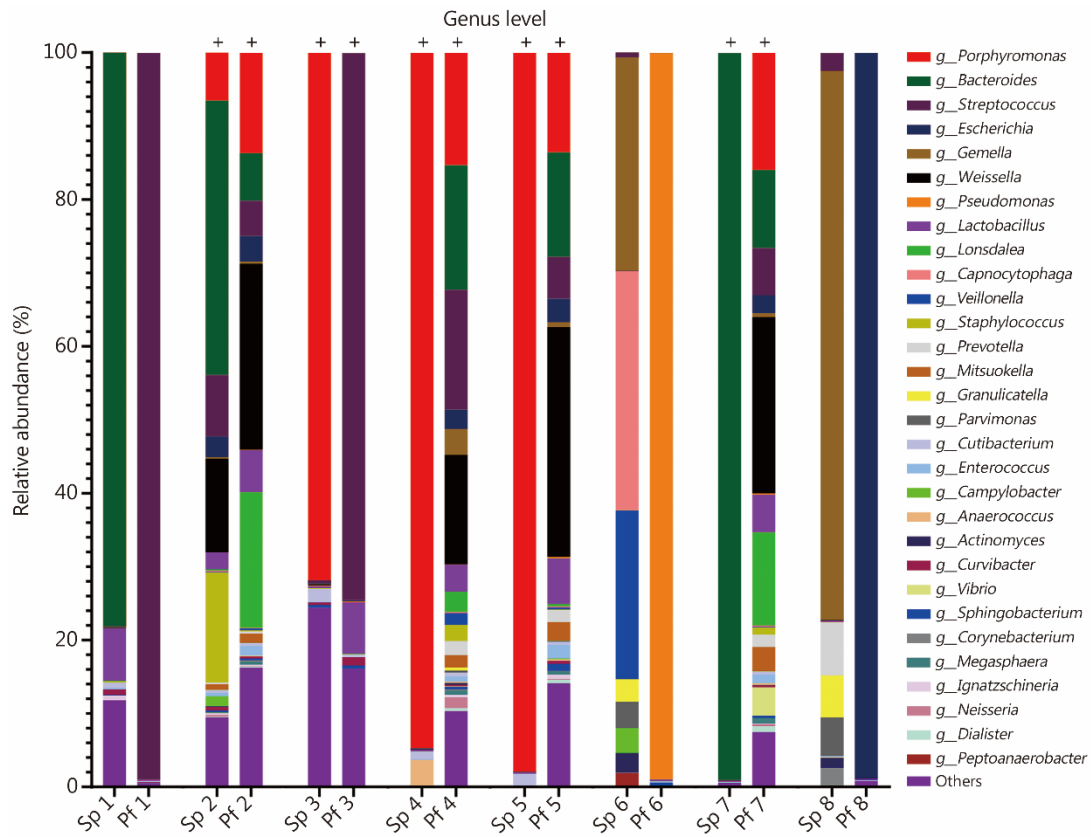
28 **Fig. S1** Relative abundance of microbial composition at the family level in all samples.

29 Each bar represents a subject sample and each colored box represents a bacterial family.

30 Sp subgingival plaque, Pf prostatic fluid

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34 **Fig. S2** Histogram of relative abundance of microbial composition at the genus level in
 35 subgingival plaque (Sp) and prostatic fluid (Pf) of 8 patients. Each bar represents a subject
 36 sample and each colored box represents a bacterial genus. + indicates that *P. gingivalis* was
 37 detected

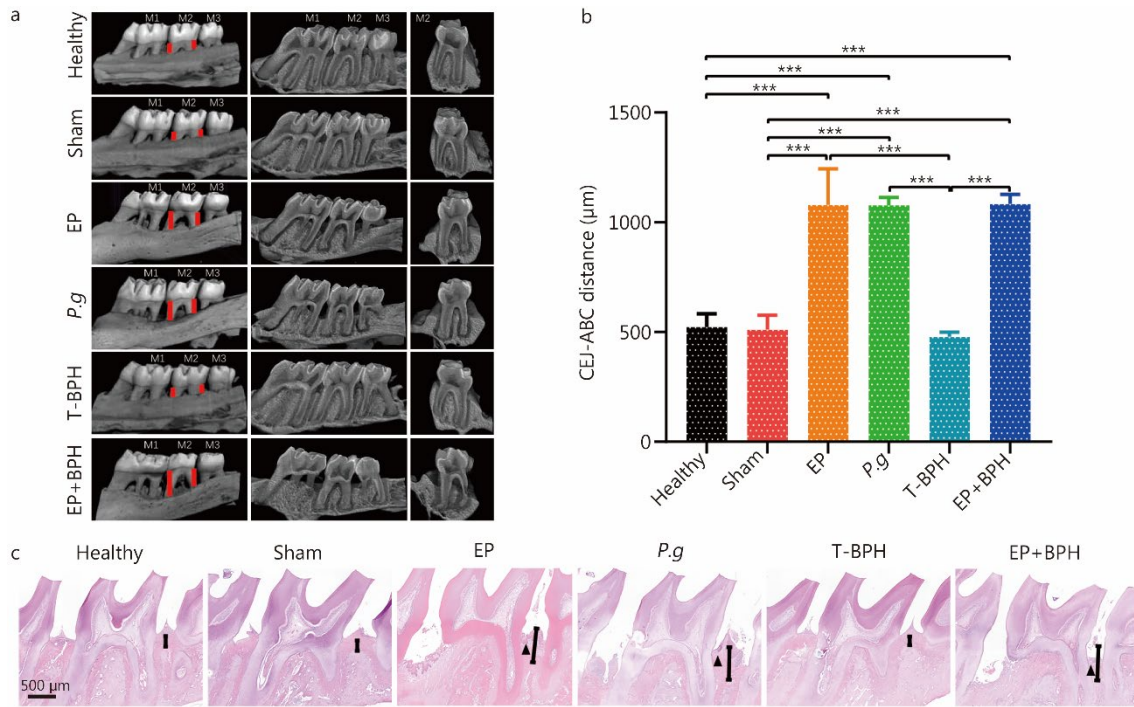
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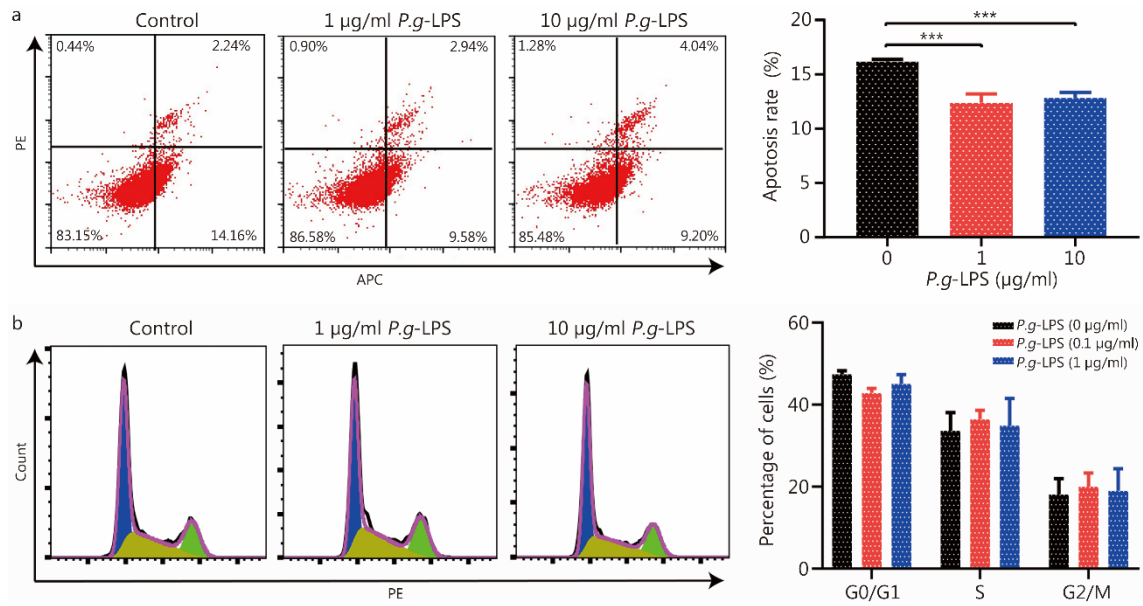
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44 **Fig. S3** Alveolar bone loss and histological changes in rat periodontal tissues. **a**
 45 Representative image obtained by micro-CT. The red lines showed the linear distance
 46 from the cement-enamel junction (CEJ) to the alveolar bone crest (ABC) for the maxillary
 47 second molar. **b** Quantitative analysis of the CEJ-ABC distance from the healthy, sham,
 48 EP, *P.g*, T-BPH and EP + BPH groups. Data are presented as mean \pm SD, *** P < 0.001. **c**
 49 Representative figures from HE staining for the second maxillary alveolar bones (arrows
 50 indicate inflammatory changes in the gingival epithelium, scale plates indicate linear
 51 distance from CEJ to ABC; original magnification $\times 40$). *** P < 0.001. EP ligature-
 52 induced experimental periodontitis group, *P.g porphyromonas gingivalis* induced BPH
 53 group, T-BPH testosterone-induced BPH group, EP+BPH composite group of EP and
 54 BPH

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59 **Fig. S4** Flow cytometry analyses for apoptosis and cell cycle of WPMY-1 cells treated
 60 with selected concentrations of *P. gingivalis* LPS. **a** Flow cytometry analyses for
 61 apoptosis of WPMY-1 cells treated with selected concentrations of 0, 1 and 10 $\mu\text{g/ml}$ *P.g*-
 62 LPS for 24 h, respectively. **b** Flow cytometry analyses for cell cycle in WPMY-1 cells
 63 treated with selected concentrations of 0, 1 and 10 $\mu\text{g/ml}$ *P.g*-LPS for 24 h, respectively.
 64 Data are expressed as mean \pm SD. * $P < 0.05$, *** $P < 0.001$. *P.g*-LPS *Porphyromonas*
 65 *gingivalis* lipopolysaccharide, PE phycoerythrin, APC allophycocyanin

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