

Table S1 Antibodies used in this study

Antibodies	Source/Cat. No.	Host	Dilution
Tyrosine hydroxylase (TH)	Proteintech (25859-1-AP)	Rabbit	1:1000 (WB) 1:400 (IF)
α -synuclein (α -syn)	Proteintech (10842-1-AP)	Rabbit	1:1000 (WB) 1:200 (IF) 1:50 (IHC)
p- α -synuclein (p- α -syn)	CST (23706T)	Rabbit	1:1000 (WB) 1:400 (IF) 1:50 (IHC)
Glucagon-like peptide 1 receptor (GLP-1R)	Proteintech (26196-1-AP)	Rabbit	1:1000 (WB)
IBA1	Proteintech (10904-1-AP)	Mouse	1:500 (WB) 1:50 (IF)
GFAP	Proteintech (60190-1-Ig)	Mouse	1:5000 (WB) 1:50 (IF)
Zonula occludens-1 (ZO-1)	Proteintech (21773-1-AP)	Rabbit	1:500 (WB)
occludin	Proteintech (13409-1-AP)	Rabbit	1:1000 (WB)
β -actin	CST (4970S)	Mouse	1:1000 (WB)
Dopamine transporter DAT	Proteintech (22524-1-AP)	Rabbit	1:1000 (WB)
Phospho-GSK-3 β (Ser9) (p-GSK-3 β ^{Ser9})	CST (5558S)	Rabbit	1:1000 (WB) 1:50 (IHC)
GSK-3 β	CST (12456S)	Rabbit	1:1000 (WB)
GLP-1	Abcam, (ab133329)	Rabbit	1:250 (IF)
PI3 Kinase (PI3K)	CST (4249S)	Rabbit	1:1000 (WB)
Phospho-PI3 Kinas (p-PI3K)	CST (17366S)	Rabbit	1:1000 (WB)
AKT	CST (9272S)	Rabbit	1:1000 (WB)
Phospho-AKT (p-Akt)	CST (4060S)	Rabbit	1:2000 (WB)
NF- κ B p65	CST (8242T)	Rabbit	1:1000 (WB)
Phospho-NF- κ B p65 (p-p65)	CST (3033T)	Rabbit	1:1000 (WB)
BCL-2	Proteintech (68103-1-Ig)	Mouse	1:5000 (WB)
BAX	Proteintech (50599-2-Ig)	Rabbit	1:2000 (WB)
caspase-3	Proteintech (19677-1-AP)	Rabbit	1:500 (WB)
cleaved-caspase-3	Proteintech (68773-1-Ig)	Mouse	1:5000 (WB)

Table S2 The primer sequences used in this study

Primer names	Primer sequence (5' to 3')	Number of bases
F TNF- α	CCCTCACACTCAGATCATCTTCT	23
B TNF- α	GCTACGACGTGGGCTACAG	19
F IL-1 β	GCAACTGTTTCCTGAACTCAACT	22
B IL-1 β	ATCTTTTGGGGTCCGTCAACT	21
F IL-6	TAGTCCTTCCTACCCCAATTTCC	23
B IL-6	TTGGTCCTTAGCCACTCCTTC	21
F GLP-1R	ACGGTGTCCCTCTCAGAGAC	20
B GLP-1R	ATCAAAGGTCCGGTTGCAGAA	21

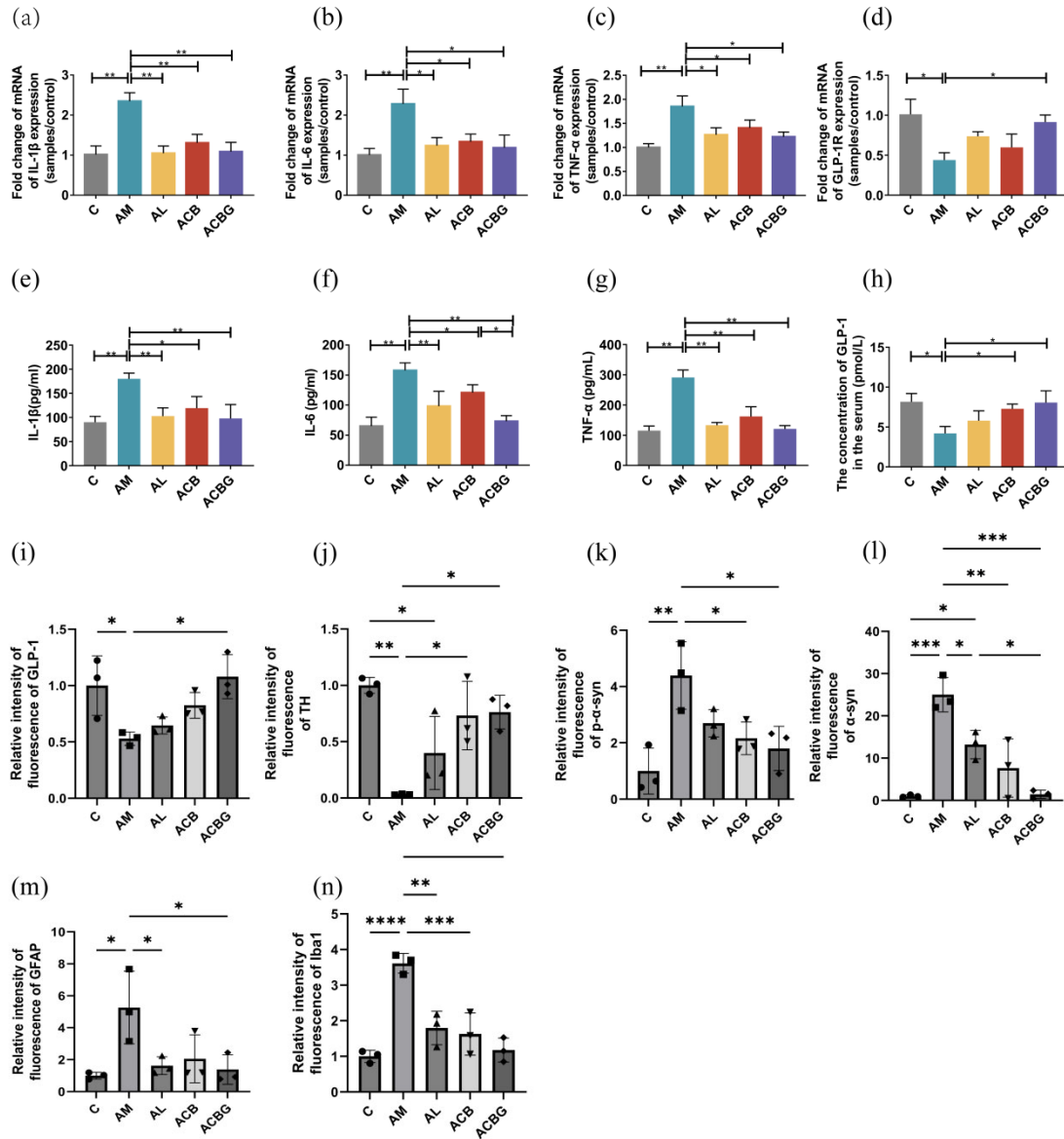


Fig. S1 Messenger RNA (mRNA) expression levels of pro-inflammatory mediators. (a) Interleukin (IL)-1 β . (b) IL-6. (c) Tumor necrosis factor alpha (TNF- α). (d) mRNA expression level of glucagon-like peptide-1 receptor (GLP-1R) in the substantia nigra (SN). (e–g) Enzyme-linked immunosorbent assay (ELISA) analysis of concentrations of IL-1 β (e), IL-6 (f), and TNF- α (g) in serum. (h) ELISA analysis of GLP-1 concentration in serum. Quantitative analysis of GLP-1 (i) fluorescent in the colon; Quantitative analysis of TH (j), p- α -syn (k), α -syn (l), GFAP (m) and Iba1 (n) fluorescent in the SN. Data were analyzed by one-way analysis of variance (ANOVA) with Tukey's post hoc test for multiple comparisons. Data are presented as mean $\pm$ standard deviation (SD). * $P<0.05$, ** $P<0.01$. C: Normal mice ($n=3$); AM: Parkinson's disease (PD) mice ($n=3$); AL: Liraglutide-treated PD mice ($n=3$); ACB: *Clostridium butyricum*-treated PD mice ($n=3$); ACBG: *C. butyricum*-pMTL007-GLP-1-treated PD mice ($n=3$).