Table S1 Primer sequences used for real-time PCR

Gene	Sequence
IL-6	Forward CAAAGCCAGAGTCCTTCAGAG
	Reverse GTCCTTAGCCACTCCTTCTG
OSM	Forward AACTCTTCCTCTCAGCTCCT
	Reverse TGTGTTCAGGTTTTGGAGGC
IL-11	Forward TGGGACATTGGGATCTTTGC
	Reverse CATTGTACATGCCGGAGGTAG
LIF	Forward TTCCCATCACCCCTGTAAATG
	Reverse GAAACGGCTCCCCTTGAG
RANKL	Forward CAATGGCTGGCTTGGTTTCATAG
	Reverse CTGAACCAGACATGACAGCTGGA
β-actin	Forward TGAGAGGGAAATCGTGCGTGAC
	Reverse AAGAAGGAAGGCTGGAAAAGAG

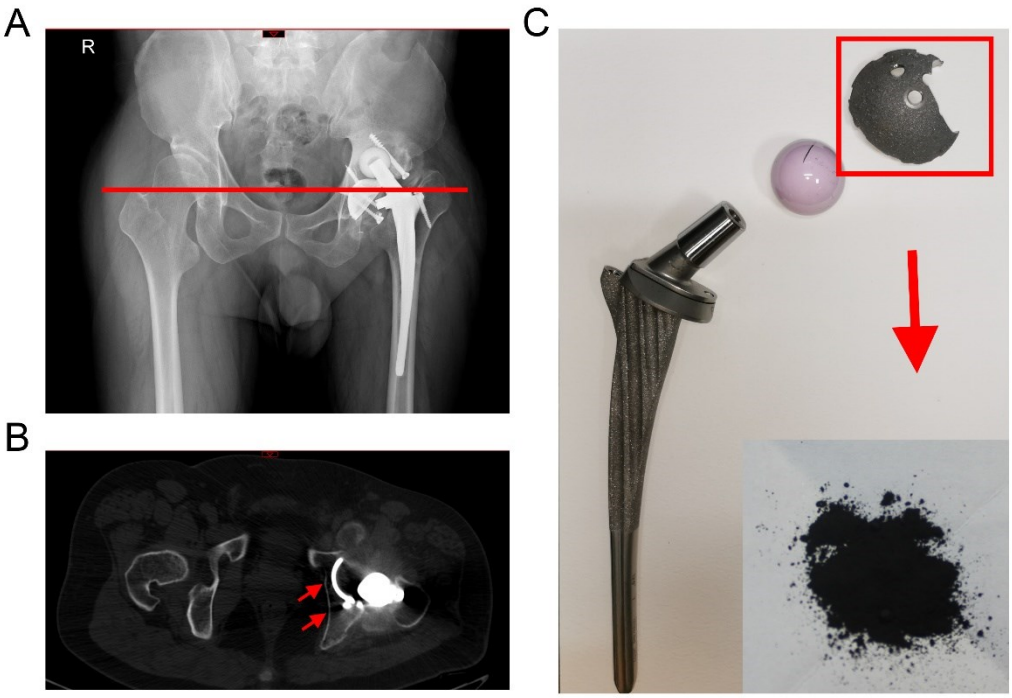

Figure S1 the TiAl6V4 nanoparticles derived from prosthesis of patients with aseptic loosening. A, the CT image of patients with aseptic loosening. The red line indicates the location of cross-sectional image. B, the cross-sectional image of A. arrow indicates the aseptic loosening of prosthesis. C, prosthesis of patients with aseptic loosening were placed into a fabricated high-vacuum three-electrode direct current and the TiAl6V4 nanoparticles used in the present study were obtained.

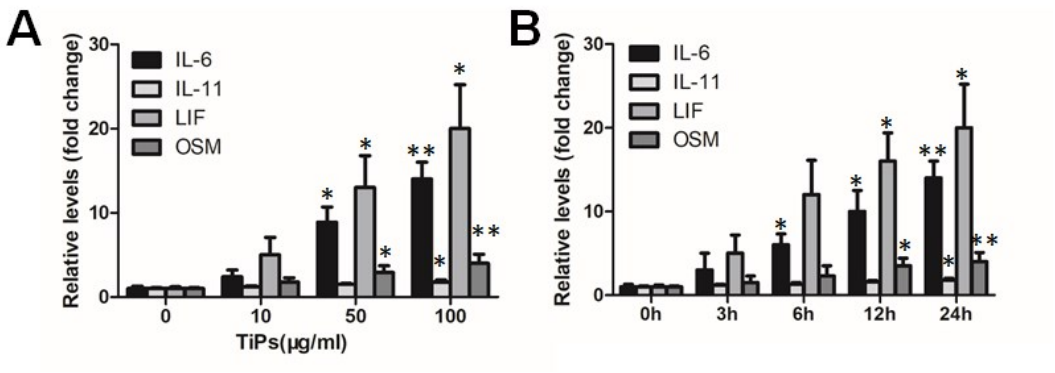

Figure S2 TiAl6V4 nanoparticles induced up-regulation of IL-6 family cytokine expression in osteoblast. A, IL-6, IL-11, LIF and OSM RNA levels of osteoblast cultured with TiAl6V4 in concentration gradient for 24h. *p<0.05, **p<0.01. B, IL-6, IL-11, LIF and OSM RNA levels of osteoblast cultured with TiAl6V4 (100μg/ml) in time gradient. *, p<0.05, **p<0.01. Data of cellular experiments are representative examples of at least three separate experiments.

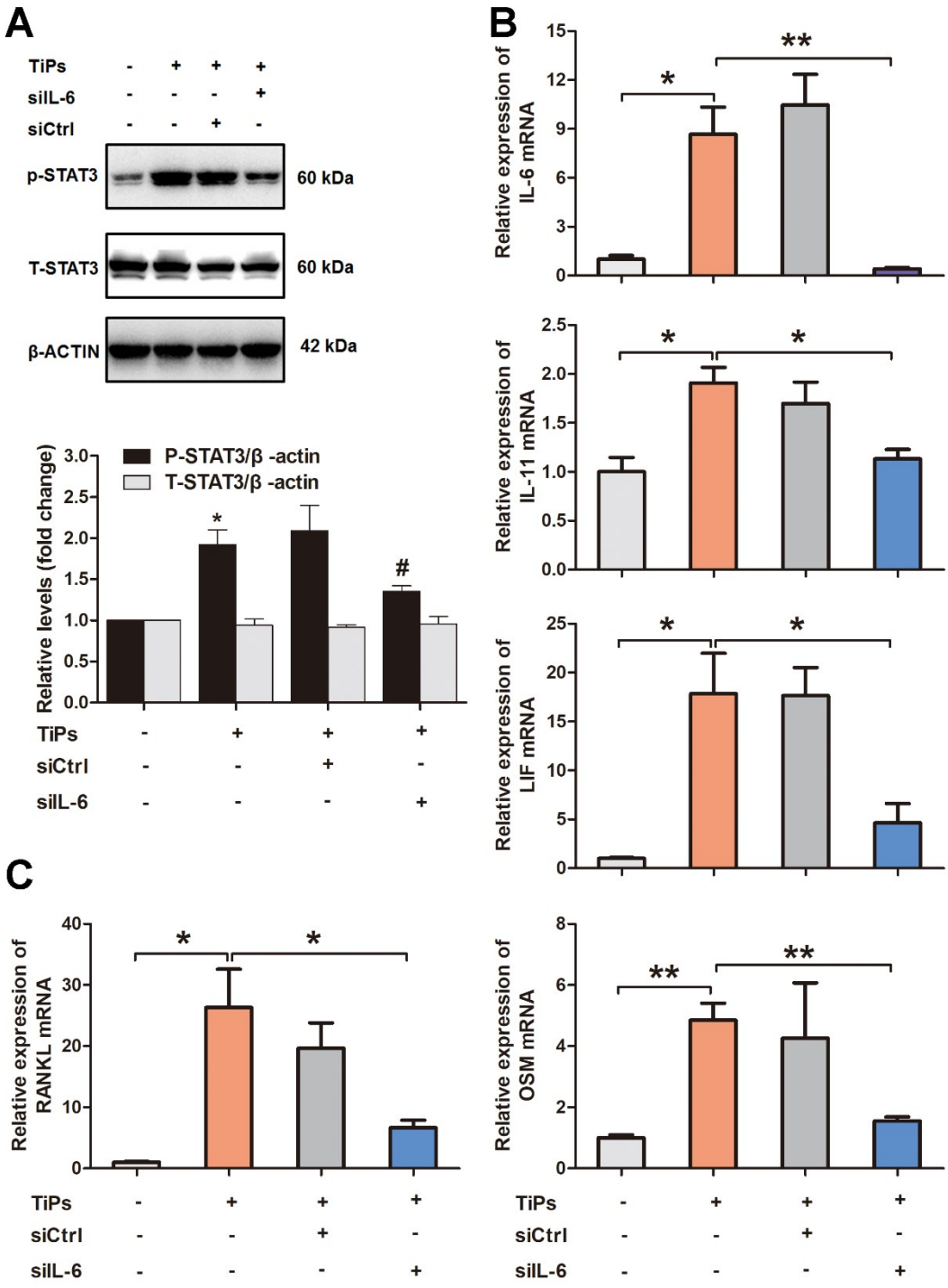

Figure S3 IL-6 mediated STAT3 activation, inflammatory response and RANKL expression. A, STAT3 and phosphorylated STAT3 protein levels of osteoblast cultured with TiAl6V4 nanoparticles (TiPs) and siIL-6 and the intensity protein bands measured by Gene Tools. $^{*}p<0.05$ vs control group, $^{\#}p<0.05$ vs TiPs group. B, the expression of IL-6 dependent inflammatory

cytokines (IL-6, IL-11, LIF and OSM) of osteoblast cultured with TiPs and siIL-6. C, the expression of RANKL of osteoblast cultured with TiPs and siIL-6. The data of all the experiments are represented as the mean ± SEM from three independent experiment.

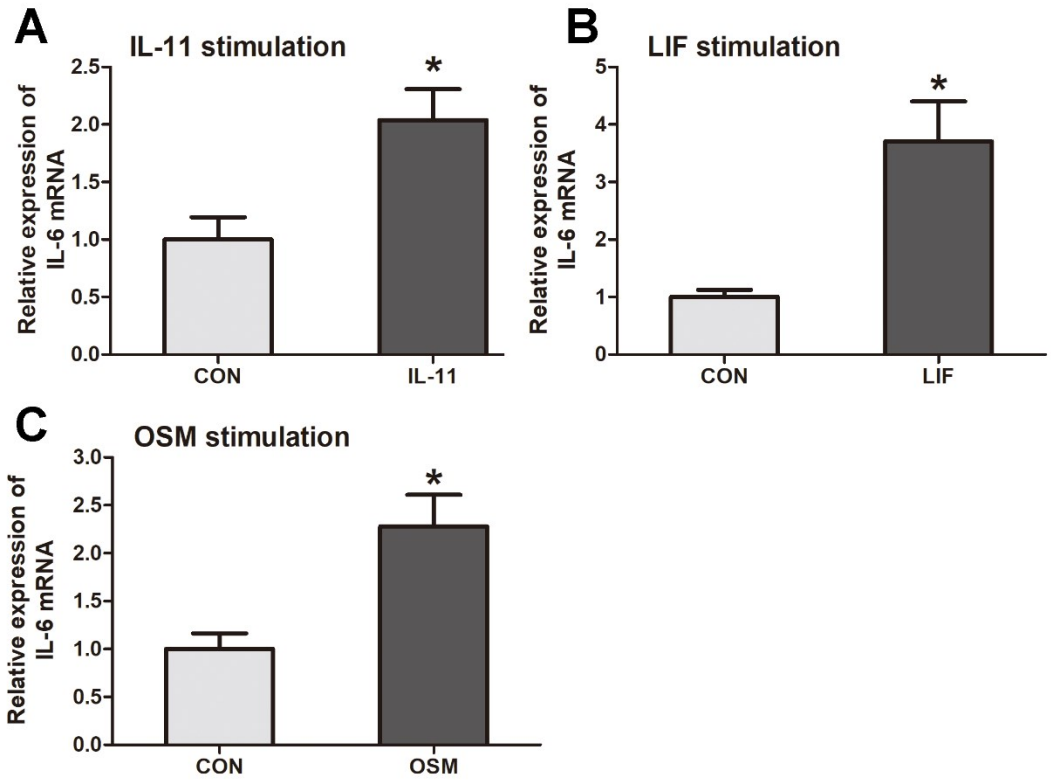

Figure S4 IL-11, LIF and OSM mediated IL-6 expression. A, the expression of IL-6 of osteoblast treated with IL-11 (10ng/ml). B, the expression of IL-6 of osteoblast treated with LIF (10ng/ml). A, the expression of IL-6 of osteoblast treated with OSM (50ng/ml). $^{*}p<0.05$ vs control group. The data of all the experiments are represented as the mean ± SEM from three independent experiment.

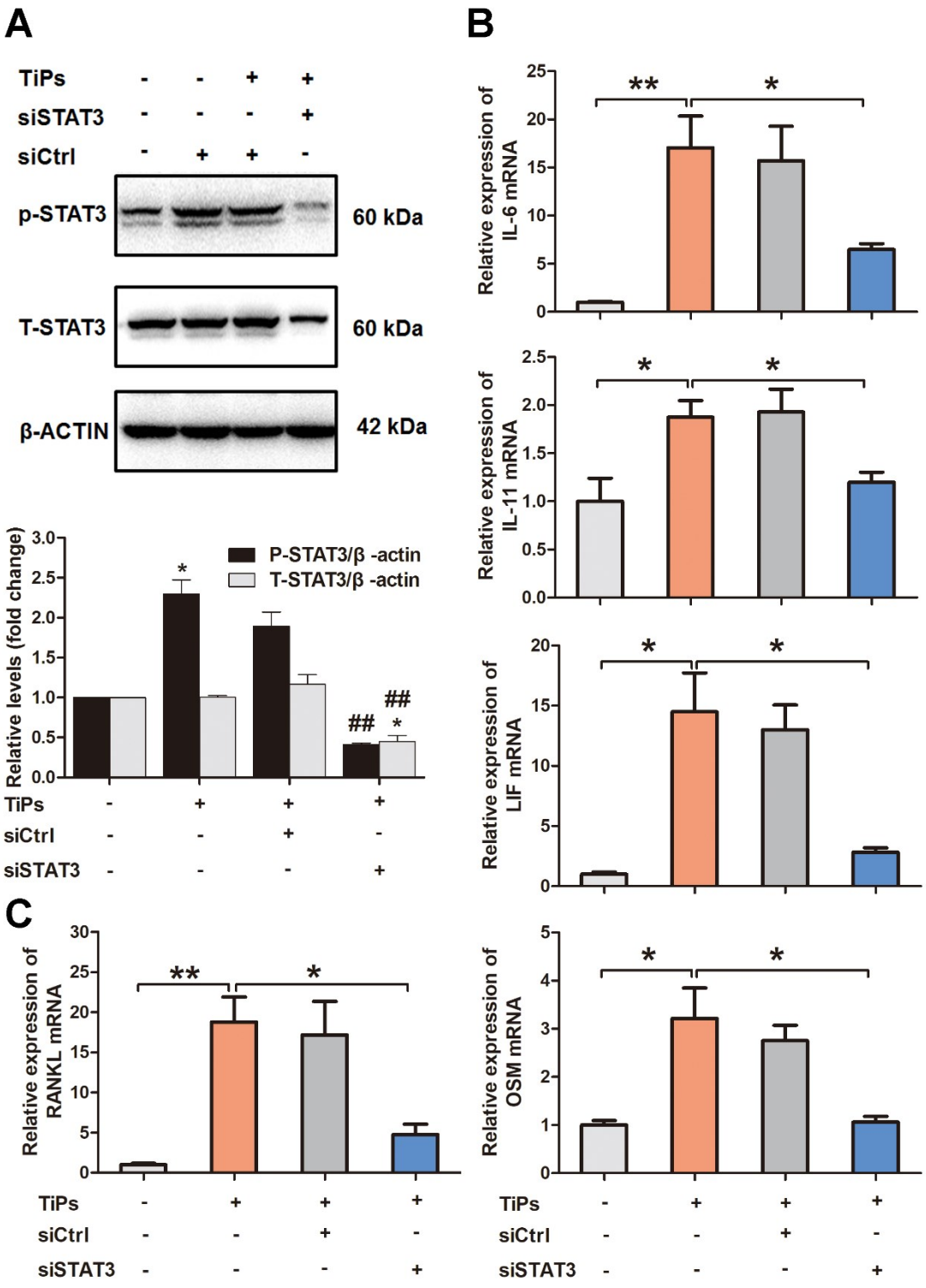

Figure S5 STAT3 mediated IL-6 dependent inflammatory response and RANKL expression. A, STAT3 and phosphorylated STAT3 protein levels of osteoblast cultured with TiAl6V4 nanoparticles (TiPs) and siSTAT3 and the intensity protein bands measured by Gene Tools.

$^{*}p<0.05$ vs control group, $^{\#\#}p<0.01$ vs TiPs group. B, the expression of IL-6 dependent inflammatory cytokines (IL-6, IL-11, LIF and OSM) of osteoblast cultured with TiPs and siSTAT3. C, the expression of RANKL of osteoblast cultured with TiPs and siSTAT3. The data of all the experiments are represented as the mean ± SEM from three independent experiment.