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Support Information

Antimicrobial peptides modification enhances the gene delivery and bactericidal efficiency of gold nanoparticles for accelerating diabetic wound healing

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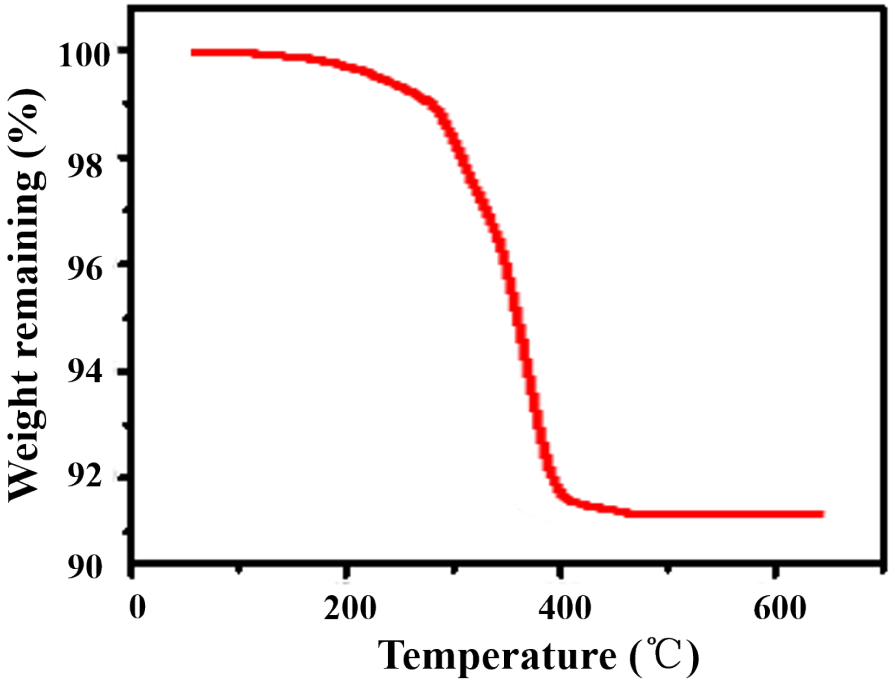

Figure S1 Thermogravimetric analysis of the PEI protected AuNPs.

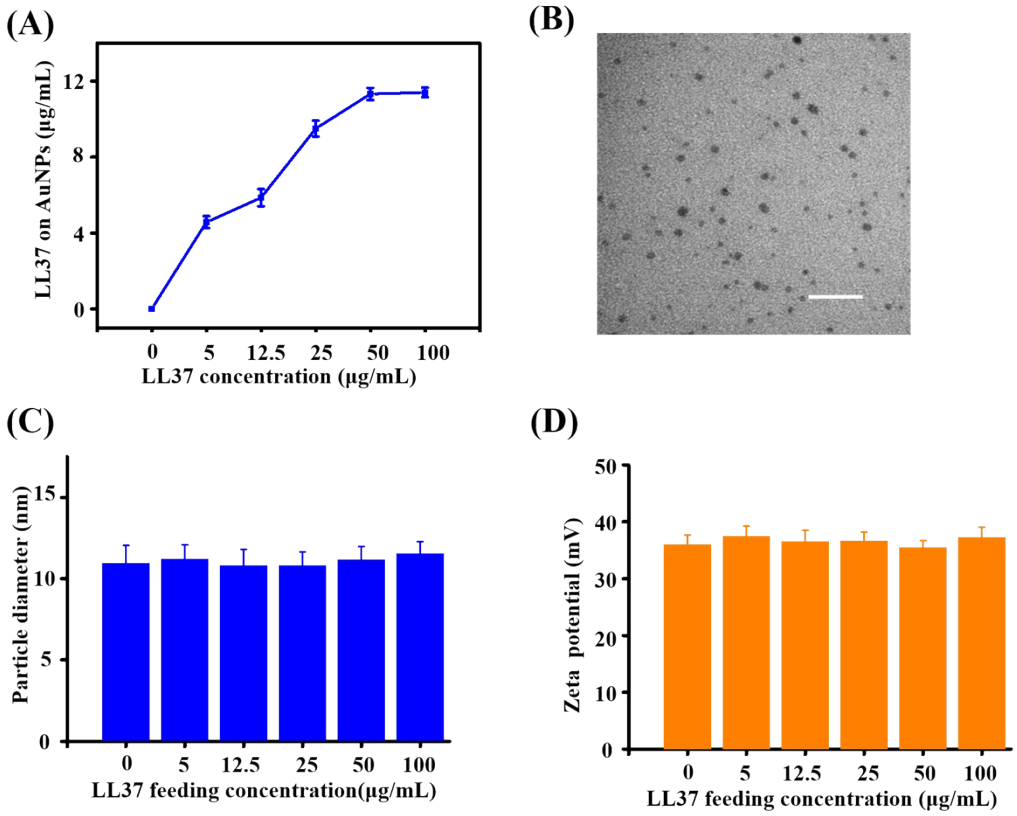

Figure S2 (A) The analysis of peptide content on AuNPs (n=5). (B) TEM images of AuNPs@LL37. (C) Particle and (D) Zeta potential of AuNPs@LL37 (n=5).

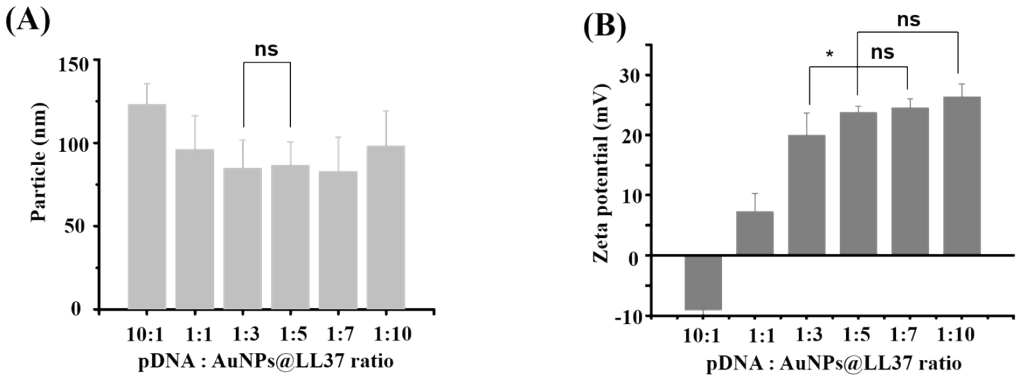

Figure S3 Effect of pDNA:AuNPs@LL37 ratio on (A) the hydrodynamic diameter and (B) zeta potential of the AuNPs@LL37 /pDNA complex (n=5), (* presents p< 0.05, NS=no significance).

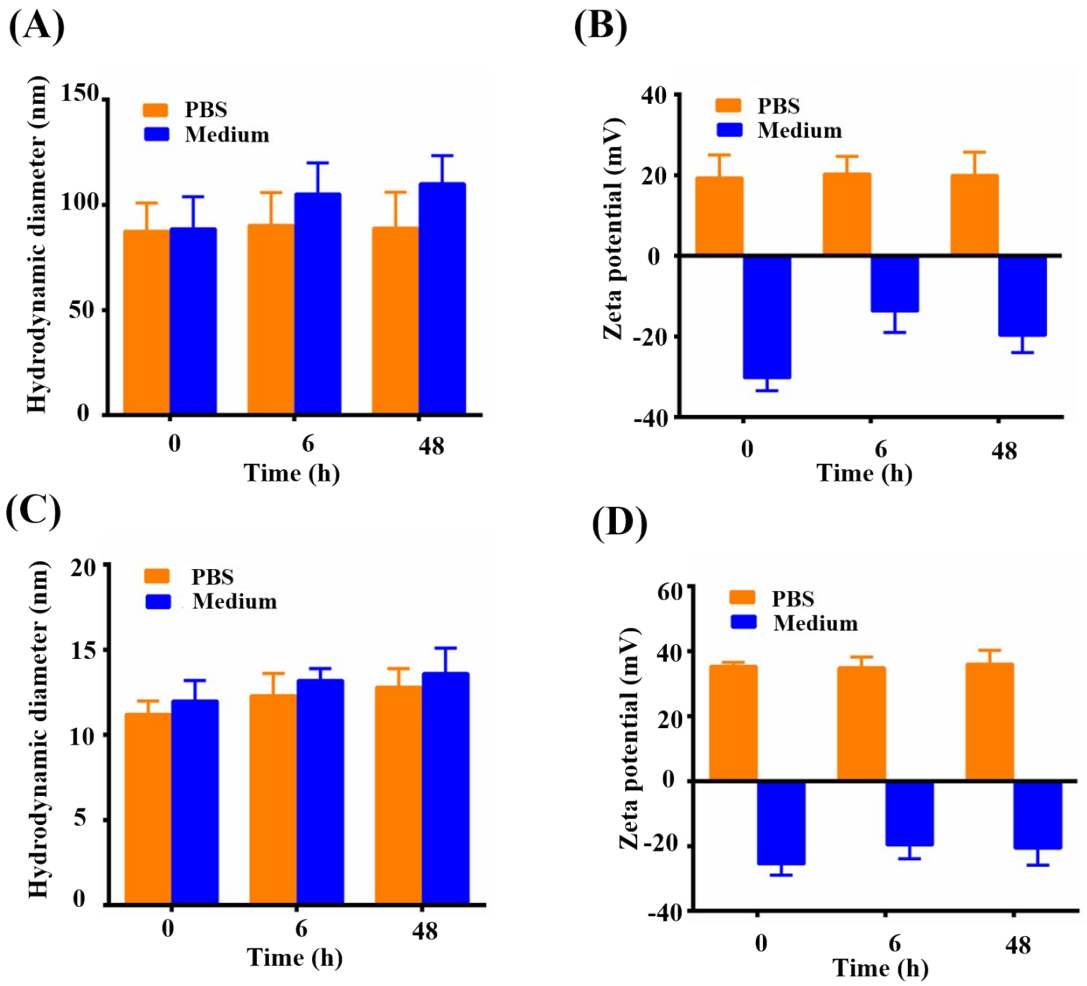

Figure S4 Stability assessment of AuNPs@LL37/pDNAs and AuNPs/pDNAs suspended in complete keratinocyte culture medium. Hydrodynamic diameter of (A) AuNPs@LL37 /pDNAs and (C) AuNPs/pDNAs (n=5). The zeta potential of (B) AuNPs@LL37/pDNAs and (D) AuNPs/pDNAs (n=5). The NPs were suspended in PBS or complete keratinocyte medium.

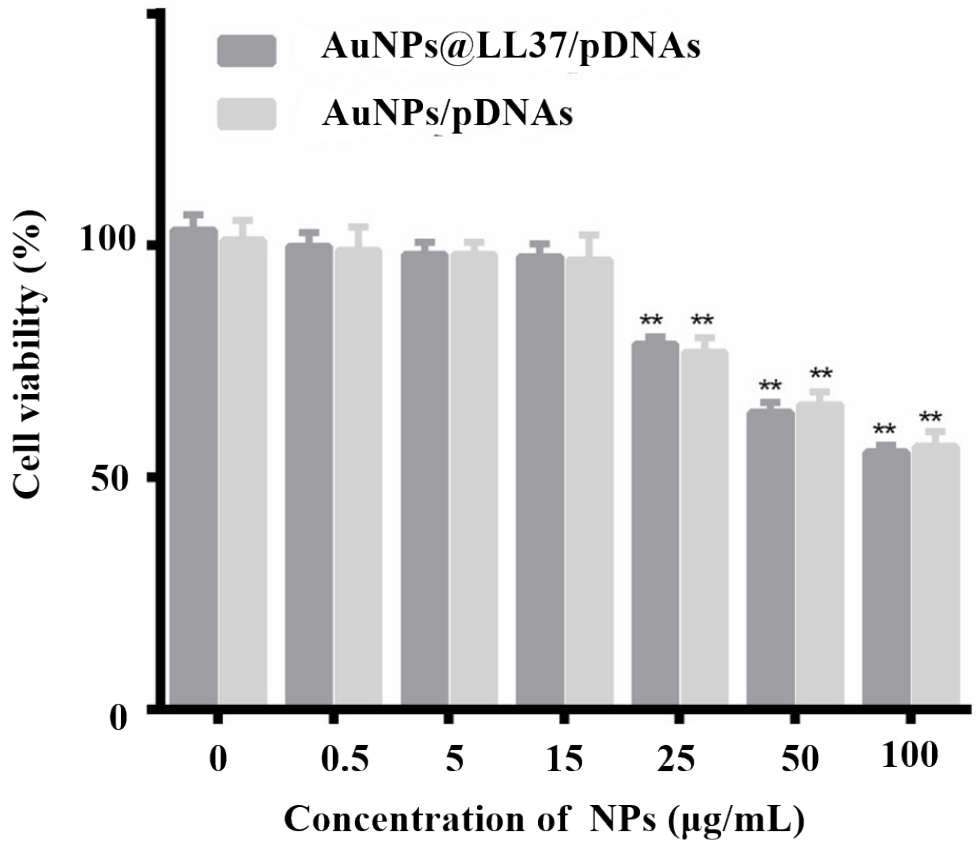

Figure S5 *In vitro* cytotoxicity of AuNPs@LL37/pDNAs. Keratinocytes were treated with different concentrations of AuNPs@LL37/pDNAs for 48 h (n=5). * and ** present significant difference (Compared with control groups) at $p < 0.05$ and $p < 0.01$ levels, separately.

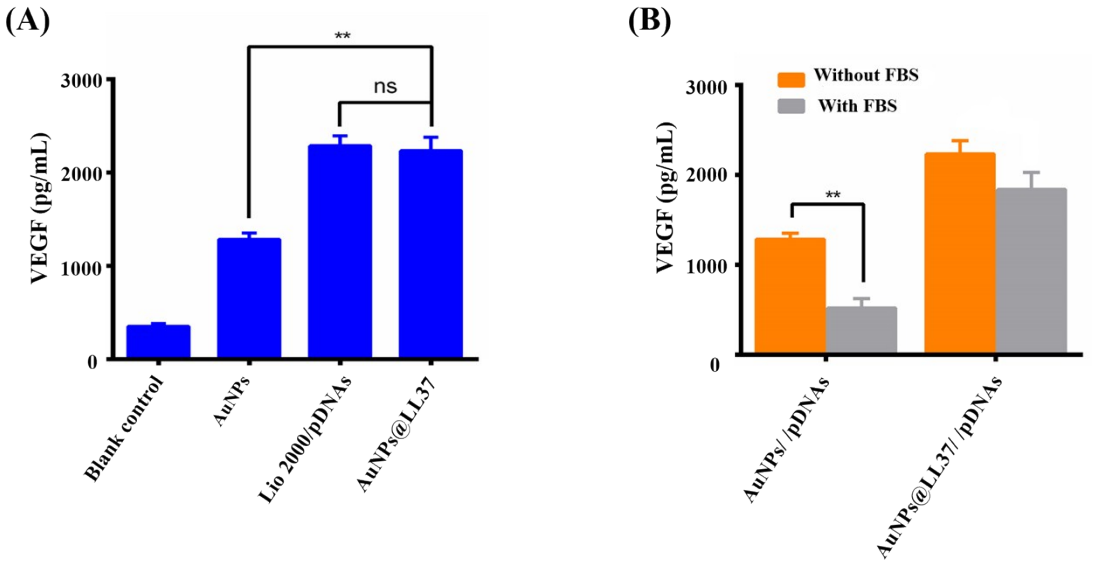

Figure S6 VEGF expression levels from transfected keratinocytes. (A) VEGF levels from keratinocytes with various treatments. (B): VEGF expression levels from keratinocytes with AuNPs/pDNAs and AuNPs@LL37/pDNAs treatments in the presence or absence of 10% FBS (n=5), respectively. * $p<0.05$, NS=non-significance.

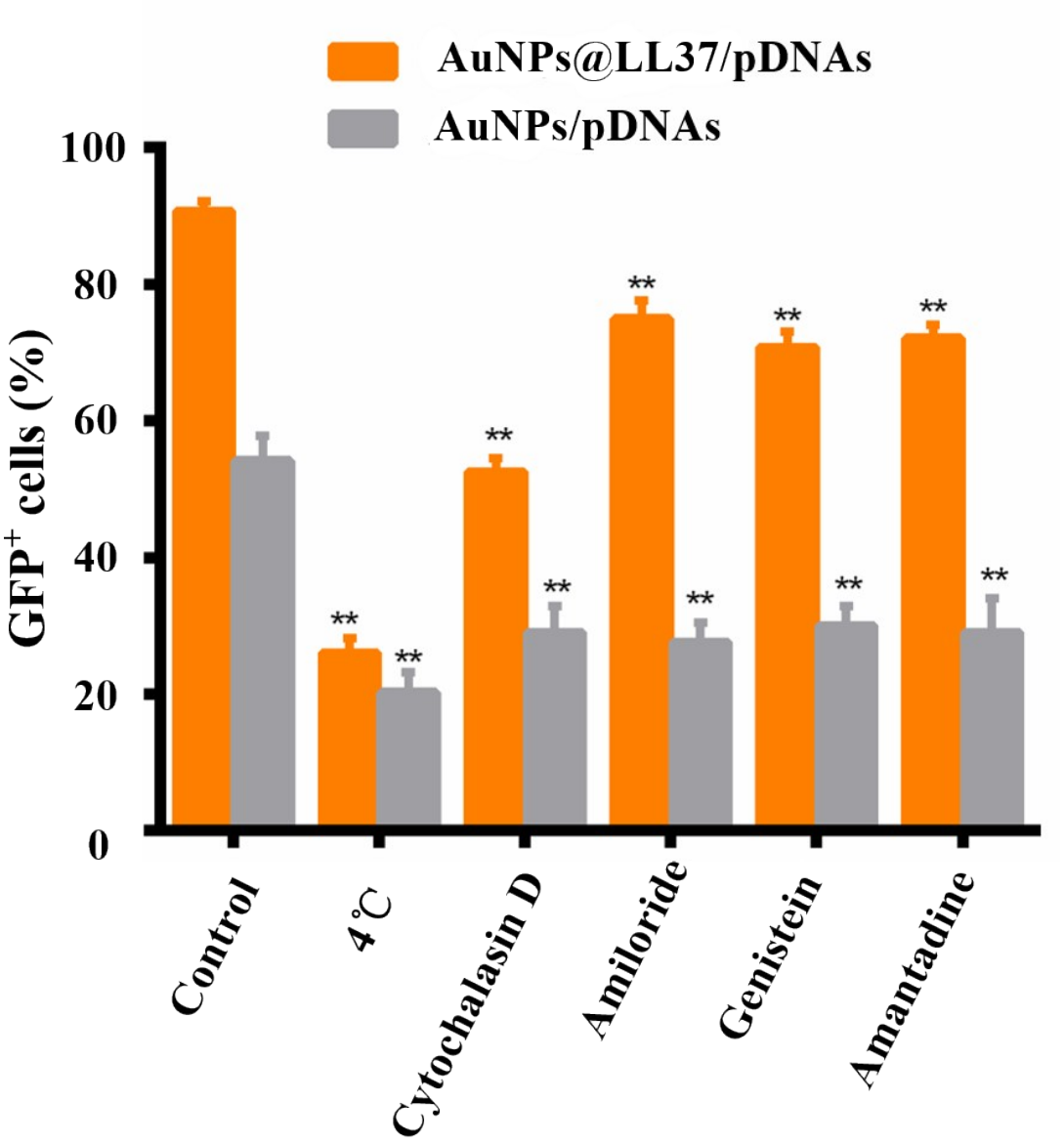

Figure S7 Flow cytometry analysis of GFP^+ cells fraction in keratinocytes with AuNPs@LL37/pDNAs treated (n=3). Cells were pretreated by amantadine-HCl, genistein, amiloride-HCl, cytochalasin D, or under 4 ^oC for 30 min, respectively. ** indicates a significant difference at $p<0.01$ level vs individual inhibitor-free control.

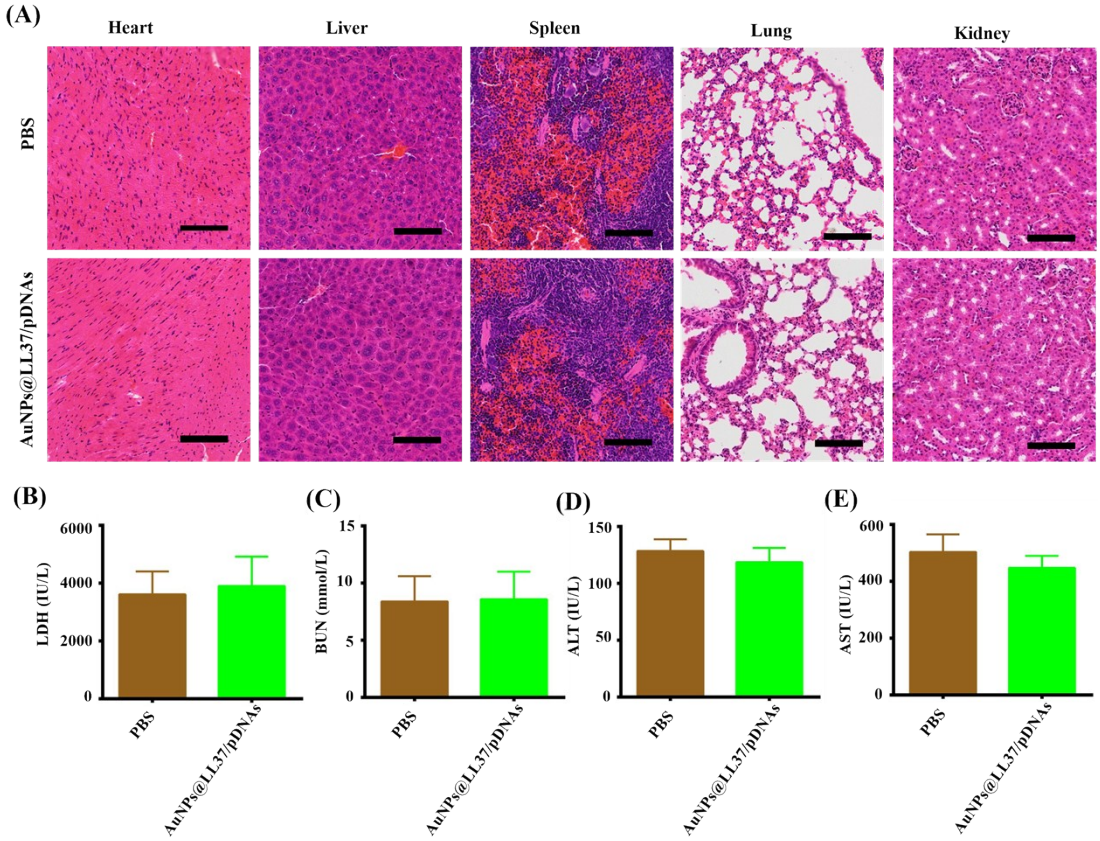

Figure S8 Biocompatibility evaluation of AuNPs@LL37/pDNAs *in vivo*. (A) H&E staining images of the major organs from PBS control mice and AuNPs@LL37/pDNAs at a concentration of 837.7 μg/mL (30 days after injection). (B) *In vivo* assessment of biochemical parameters from mice treated with PBS and AuNPs@LL37/pDNAs on the 30th day after injury (n=5). ** indicates a significant difference at $p<0.01$ level vs PBS treated control.