



Figure S1. A 3D bioscaffold.

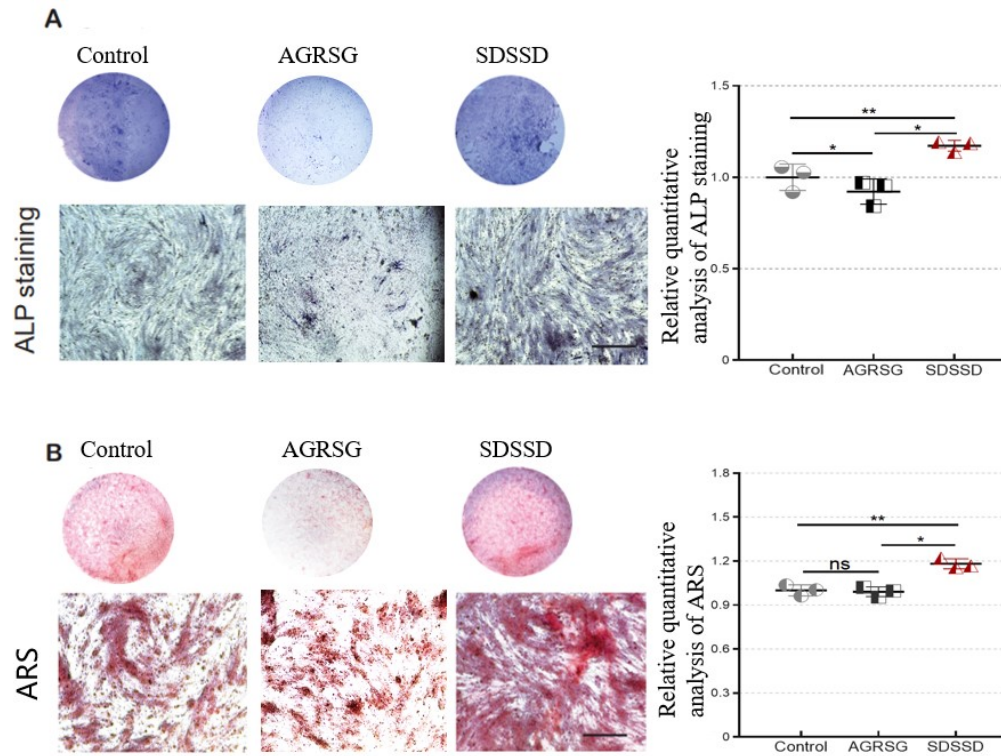


Figure S2. Oligopeptide SDSSD promotes osteogenesis of hPDLSCs on tissue culture plastic *in vitro*. **(A)** Representative images and analysis of ALP staining after SDSSD and oligopeptide AGRSG induction for 7 days. N=3. Scale bar, 200 μm . **(B)** Representative images and analysis of ARS after a 3-week SDSSD and oligopeptide AGRSG treatment. N=3. Scale bar, 100 μm . ARS, Alizarin red staining.

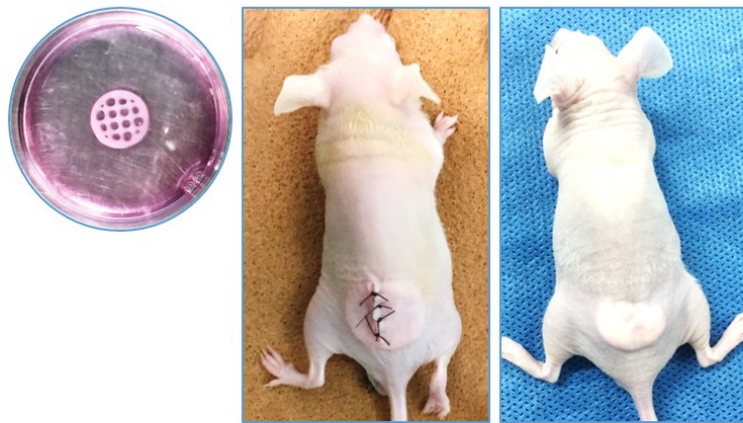
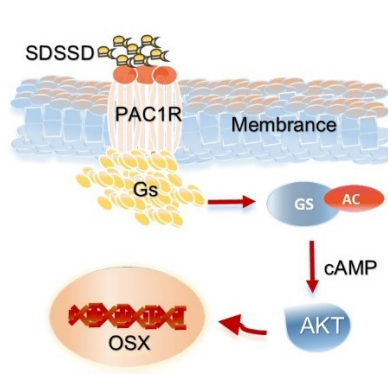
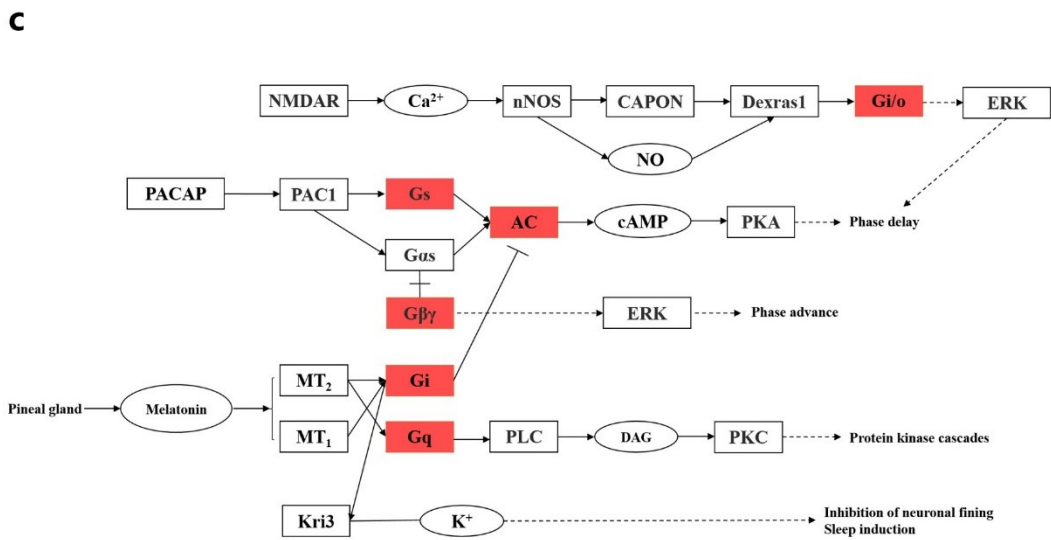
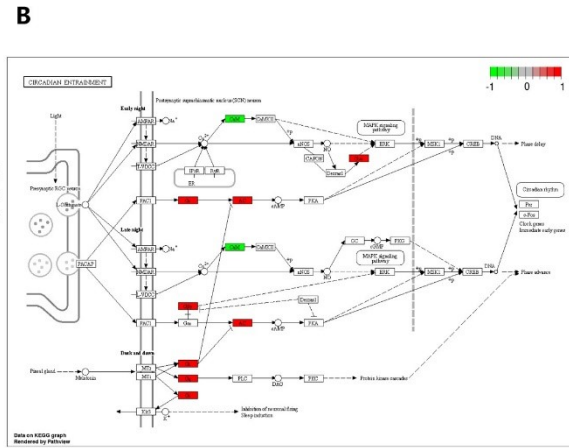
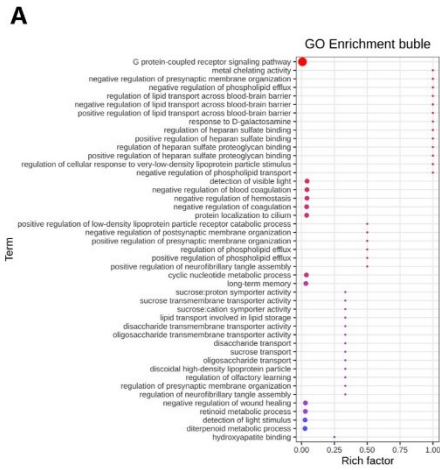


Figure S3. Three-dimensional bioscaffolds implanted into subcutaneous bags of nude mice during and 4 weeks after surgery.



E

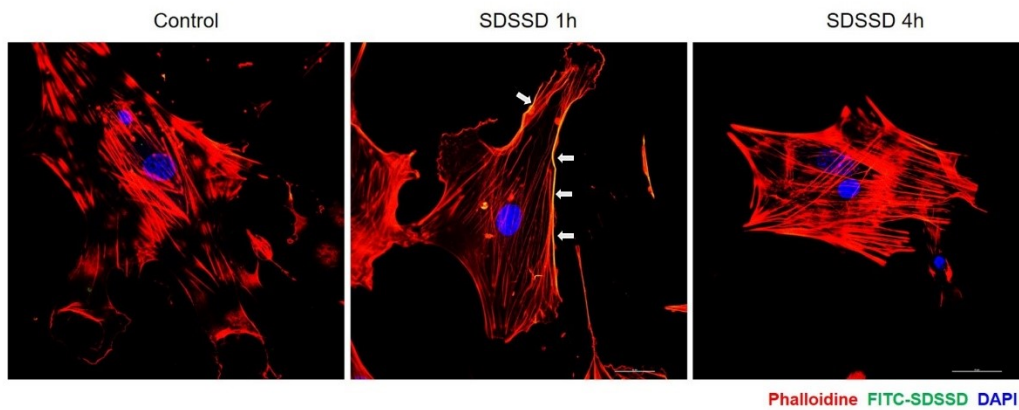


Figure S4. Mechanism of SDSSD on the osteogenic differentiation of human periodontal ligament stem cells (hPDLSCs) in bioscaffolds. **(A)** Differentially expressed genes mapped to Gene Ontology categories after 3-day osteogenic induction. **(B)** Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway analysis after 3-day osteogenic induction. **(C)** KEGG analysis of RNA-seq of SDSSD induced hPDLSCs. **(D)** Schematic drawing of the molecular mechanism SDSSD in promoting osteogenesis of hPDLSCs. **(E)** HPDLSC uptake of SDSSD 1 h after 100 ng/mL SDSSD treatment. The yellow line pointed by the white arrow is the binding part of SDSSD. Scale bar, 50 μm .

Table S1. Primer list for RT-qPCR.

Supplementary table 1 Primer list of genes for RT-qPCR

| Gene subtype | Oligonucleotide Primers (5'-3') |
|--------------|---|
| OSX | F: AAGTCTCAAGGTTATAGGGACGG R: CCATGCTTGTCTGGGTATAGTGT |
| Runx-2 | F: CAGATTACAGATCCCAGGCA R: CATCTGGCTCAGATAGGAGG |
| OCN | F: GAGGACCATCTTTCTGCTCACTCT R: TTATTGCCCTCCTGCTTGGA |
| Dmp-1 | F: AGTGAGTCATCAGAAGAAAGTCAAGC R: CTATACTGGCCTCTGTCGTAGCC |
| Col1a1 | F: TGAAGAACTGGACTGTCCC R: TTTGGTGATACGTATTCTTCCG |
| GAPDH | F: CGCATCTTCTTGTGCAGTG R: GACCTTGAGGTCTCCTTGG |

Table S2. Primary antibodies for WB and IF staining

Supplementary table 2 Primer Antibodies

| REAGENT | SOURCE | IDENTIFIER |
|----------------|----------------------|----------------|
| OCN | Affinity Biosciences | Rabbit,DF12303 |
| Osterix | Affinity Biosciences | Rabbit,DF7731 |
| AKT | ZENBIO | Rabbit,342529 |
| p-AKT | ZENBIO | Rabbit,310021 |
| ERK | ZENBIO | Rabbit,343830 |
| p-ERK | ZENBIO | Rabbit,310065 |
| GAPDH | ZENBIO | Mouse,200306 |