Supplementary information to

3D printed strontium-zinc-phosphate bioceramic scaffolds with multiple biological functions for bone tissue regeneration

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Table S1 Primer sequences for tested genes of HUVECs, MC3T3-E1 and RAW264.7 cells.

Target gene	Direction	Primer sequence (5'-3')
GAPDH (mouse)	Forward	CAGGAGAGTGTTTCCTCGTCC
	Reverse	TTTGCCGTGAGTGGAGTCAT
ALP	Forward	GGAGATGGTATGGGCGTCTC
	Reverse	GGACCTGAGCGTTGGTGTTA
RUNX-2	Forward	GACTGTGGTTACCGTCATGGC
	Reverse	ACTTGGTTTTTCATAACAGCGGA
OCN	Forward	GAACAGACAAGTCCCACACAGC
	Reverse	TCAGCAGAGTGAGCAGAAAGAT
BMP-2	Forward	TCACTTATAGCCGCATTATCTTCTTC
	Reverse	TTGGTTTATCCATGAGGCTAACTG
IL-1β	Forward	AATGCCACCTTTTGACAGTGATG
	Reverse	TGATGTGCTGCTGCGAGATT
TNF-α	Forward	TAGCCCACGTCGTAGCAAAC
	Reverse	GCAGCCTTGTCCCTTGAAGA
iNOS	Forward	ACCCCTTGTGCTGTTCTCAG
	Reverse	GGGATTCTGGAACATTCTGTGC
TGF-1β	Forward	TGATACGCCTGAGTGGCTGTCT
	Reverse	CACAAGAGCAGTGAGCGCTGAA
IL-1rα	Forward	AGAGCCCCTTATAGTCACGAA
	Reverse	TACACCCTGCAAAAGTTGTTCC
CD206	Forward	ATCCACGAGCAAATGTACCTCA
	Reverse	TAGCCAGTTCAGATACCGGAA
GAPDH (Human)	Forward	GATTTGGTCGTATTGGGCG
	Reverse	CTGGAAGATGGTGATGG
bFGF	Forward	CAATTCCCATGTGCTGTGAC
	Reverse	ACCTTGACCTCTCAGCCTCA
VEGF	Forward	TATGCGGATCAAACCTCACCA
	Reverse	CACAGGGATTTTTCTTGTCTTGCT
HIF-1α	Forward	ATCCATGTGACCATGAGGAAAT
	Reverse	CTCGGCTAGTTAGGGTACACTT
eNOS	Forward	GATGTTACCATGGCAACCAAC
	Reverse	GAAAATGTCTTCGTGGTAGCG

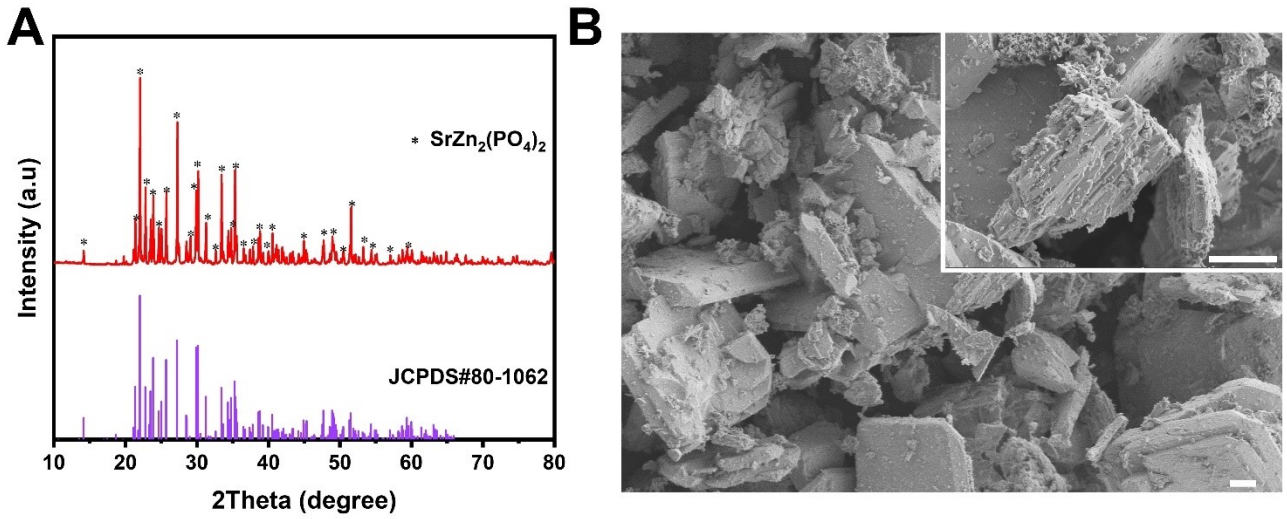

Fig. S1 Characterization of SZP powders. (A) XRD analysis of the crystalline. (B) SEM characterization of the morphology. Scale bar: 5 μm.

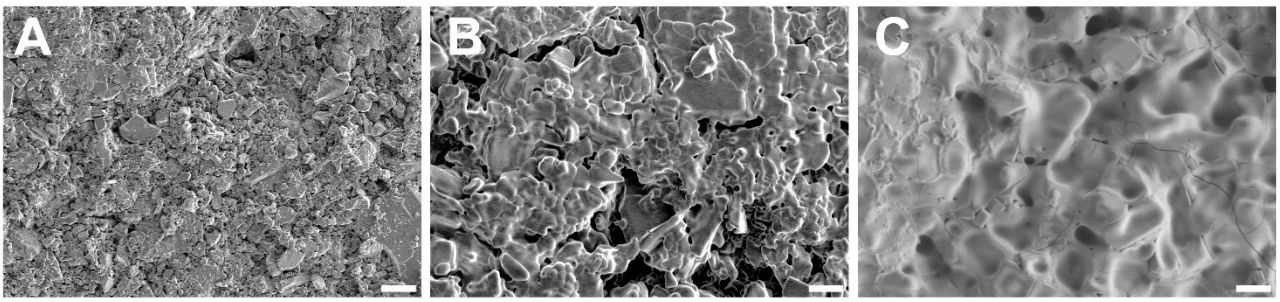

Fig. S2 SEM characterization of SZP scaffolds sintered at (A) 800 ℃, (b) 900 ℃ and (c) 1000 ℃. Scale bar: 10 μm.

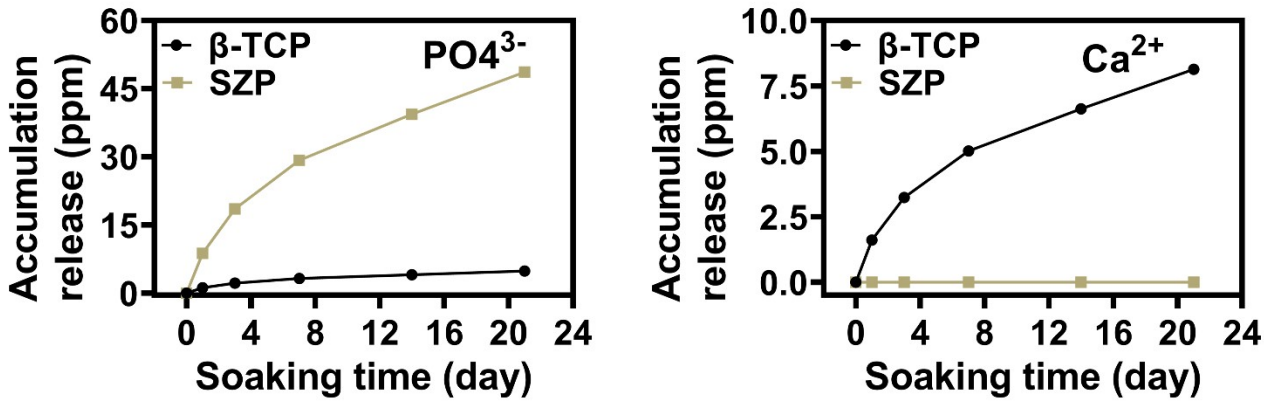

Fig. S3 Ion release profiles of PO_4^{3-} and Ca^{2+} during soaking in Tris-HCl solution (pH = 7.4) shock at 37 ℃ for 1, 3, 7, 14 and 21 days (n = 3).

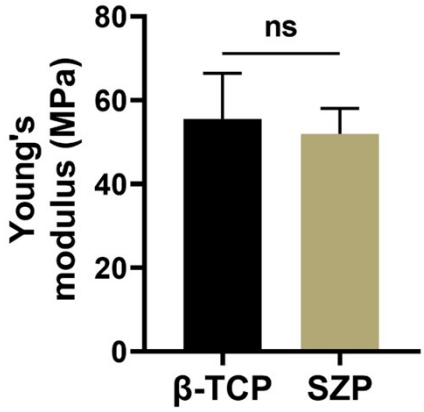

Fig. S4 Young ´s modulus of scaffolds from compressive testing (n = 3). ns: no significant difference.

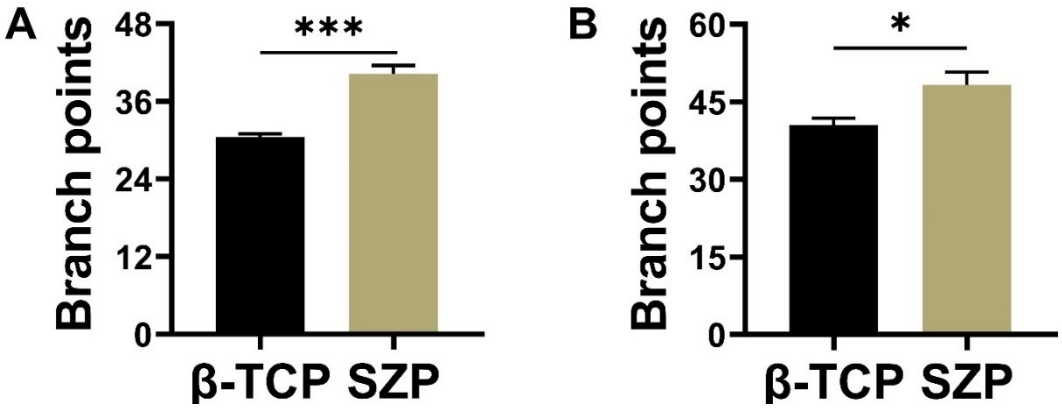

Fig. S5 Branch points of the in vitro tube formation after 4 h of culture (A) on scaffolds (n = 4), and (B) in macrophage/scaffold conditioned medium (n = 4). $^{*}P < 0.05$, $^{***}P < 0.001$.

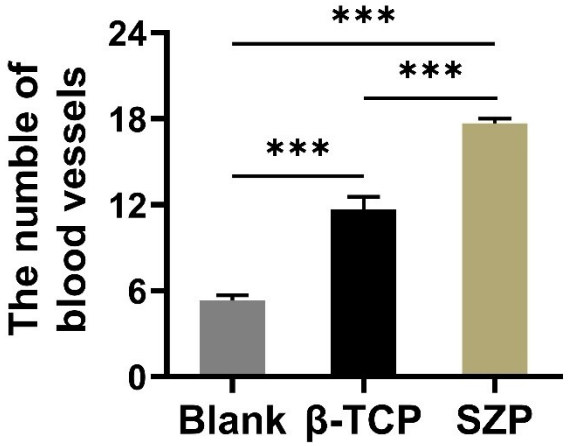

Fig. S6 The quantitative and histochemical analysis of neoangiogenesis in cranial bone defects (n = 3). $^{***}P < 0.001$.