Supplementary Information

A composite dressing combining ultralong hydroxyapatite nanowire bio-paper and calcium alginate hydrogel accelerates wound healing

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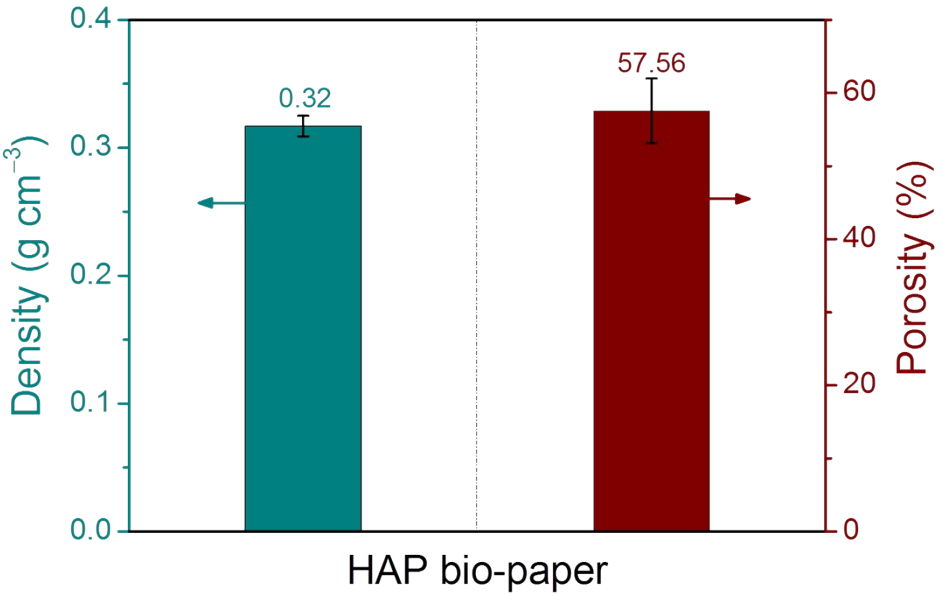
Supplementary Tables S1 and S2 and Figures S1-S6

Supplementary Table S1 List of detailed information for chemicals and reagents used in the experiments

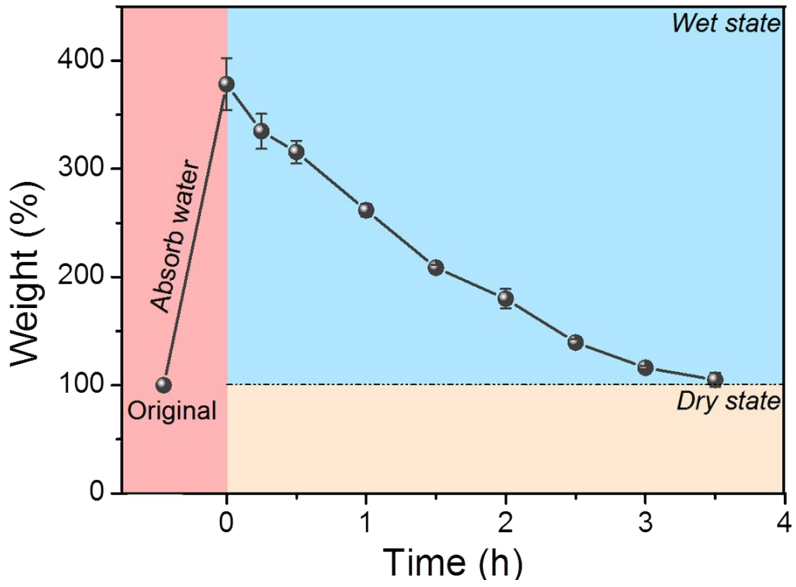
Regents	Molecular weight	Purity	Source
Calcium chloride	110.98	AR	Sinopharm Chemical Reagent Co., Ltd.
Sodium hydroxide	40.00	AR	Sinopharm Chemical Reagent Co., Ltd.
Sodium dihydrogen phosphate dihydrate	156.01	AR	Sinopharm Chemical Reagent Co., Ltd.
Alginic acid sodium	216.121	AR	Sigma-Aldrich
Oleic acid	282.46	AR	Aladdin Industrial Corporation
Methanol	32.04	≥99.5%	Shanghai Lingfeng Chemical Reagent Co., Ltd
Ethanol	46.07	≥99.7%	Shanghai Lingfeng Chemical Reagent Co., Ltd
Fetal bovine serum	/	/	LIFE ILAB BIO
Y-27632	320.3kDa	≥95%	Calbiochem
CHIR99021	465.34kDa	≥98%	Tocris Bioscience
BMP-4	34kDa	>95%	R&D Systems
VEGF-A	38.2kDa	≥ 98%	Peprotech
Matrigel	/	/	Corning
SteamPro34	/	/	Gibco
FGF-2	16.4kDa	97%	Miltenyi Biotec
DAPI	350.25kDa	≥98%	Sigma
anti-human CD31	130kDa	/	DAKO
anti-Phalloidine	469kDa	/	ThermoFisher
anti-CD31	120kDa	/	Servicebio
anti-VEGF-A	32kDa	/	Affinity
anti-p-eNOS Ser1177	133kDa	/	Cell Signaling Technology
anti-AKT	56kDa	/	Cell Signaling Technology
anti-p-AKT Ser473	56kDa	/	Abclonal
anti-β-actin	42kDa	/	Abclonal

Supplementary Table S2 Primer sequence

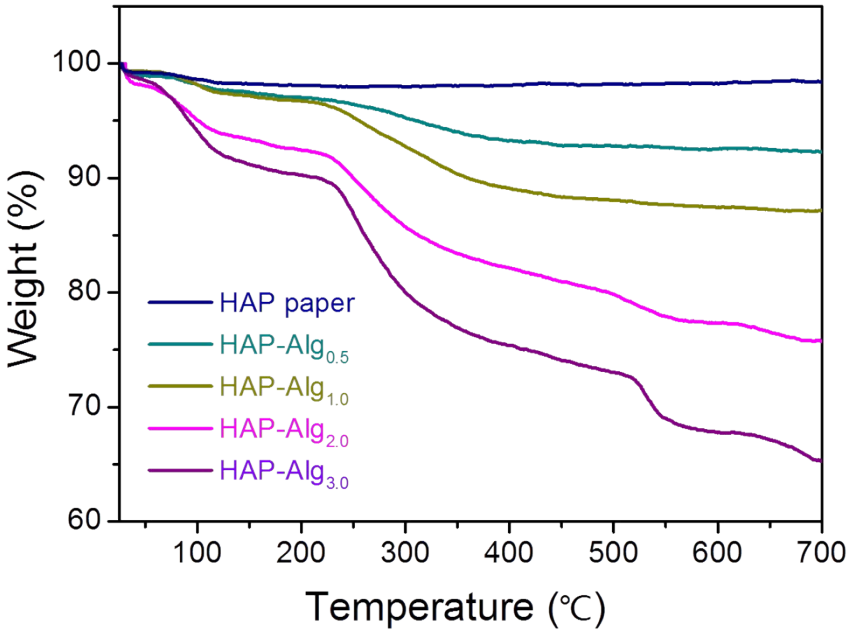
Primers	**Forward**	**Reverse**
Col-Ia	TGTTGGTCCTGCTGGCAAGAATG	GTCACCTTGTTCGCCTGTCTCAC
Col-IIIa	AGTCGGAGGAATGGGTGGCTATC	CAGGAGATCCAGGATGTCCAGAGG
β-actin	GCAGGAGTACGATGAGTCCG	ACGCAGCTCAGTAACAGTCC



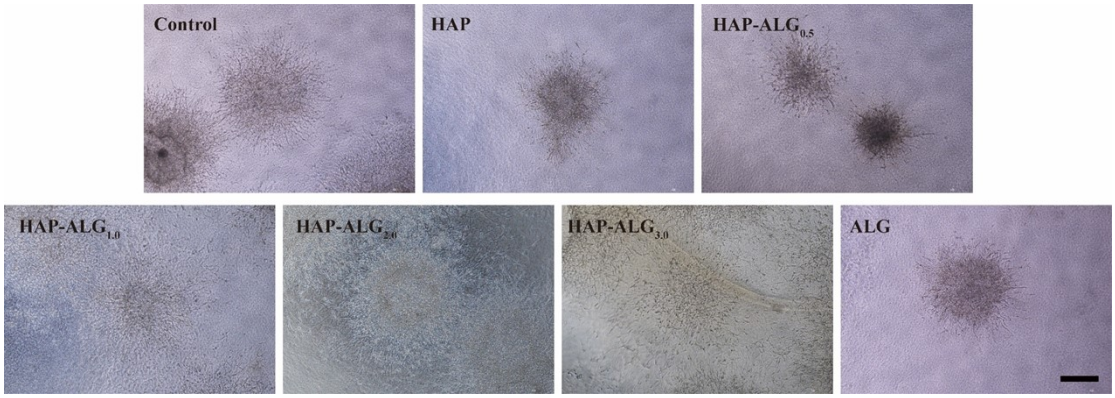
Supplementary Figure S1. Density and porosity of the HAP bio-paper consisting of ultralong HAP nanowires.



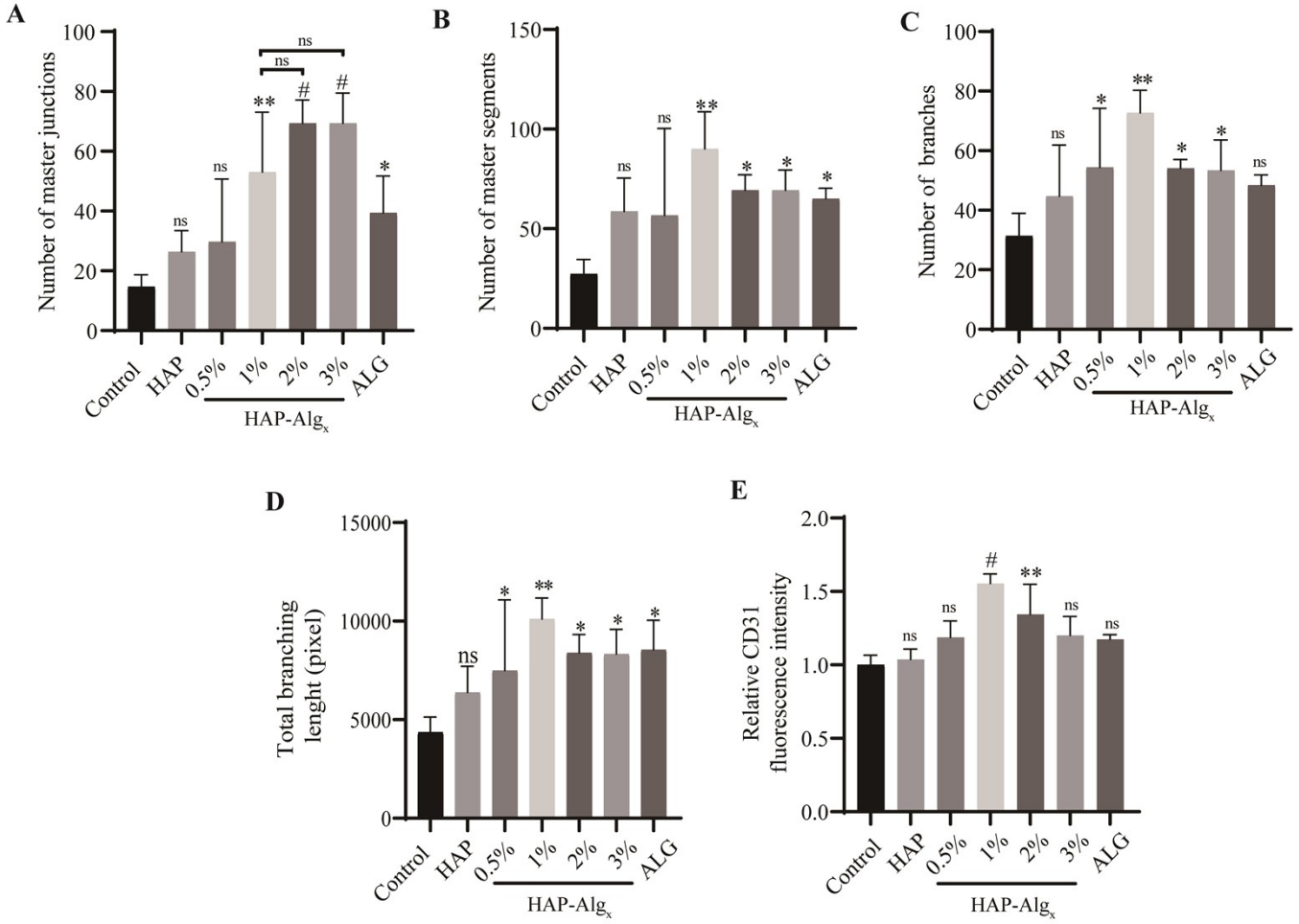
Supplementary Figure S2. Weights of the HAP bio-paper after water absorption and subsequently dried under the ambient environment.



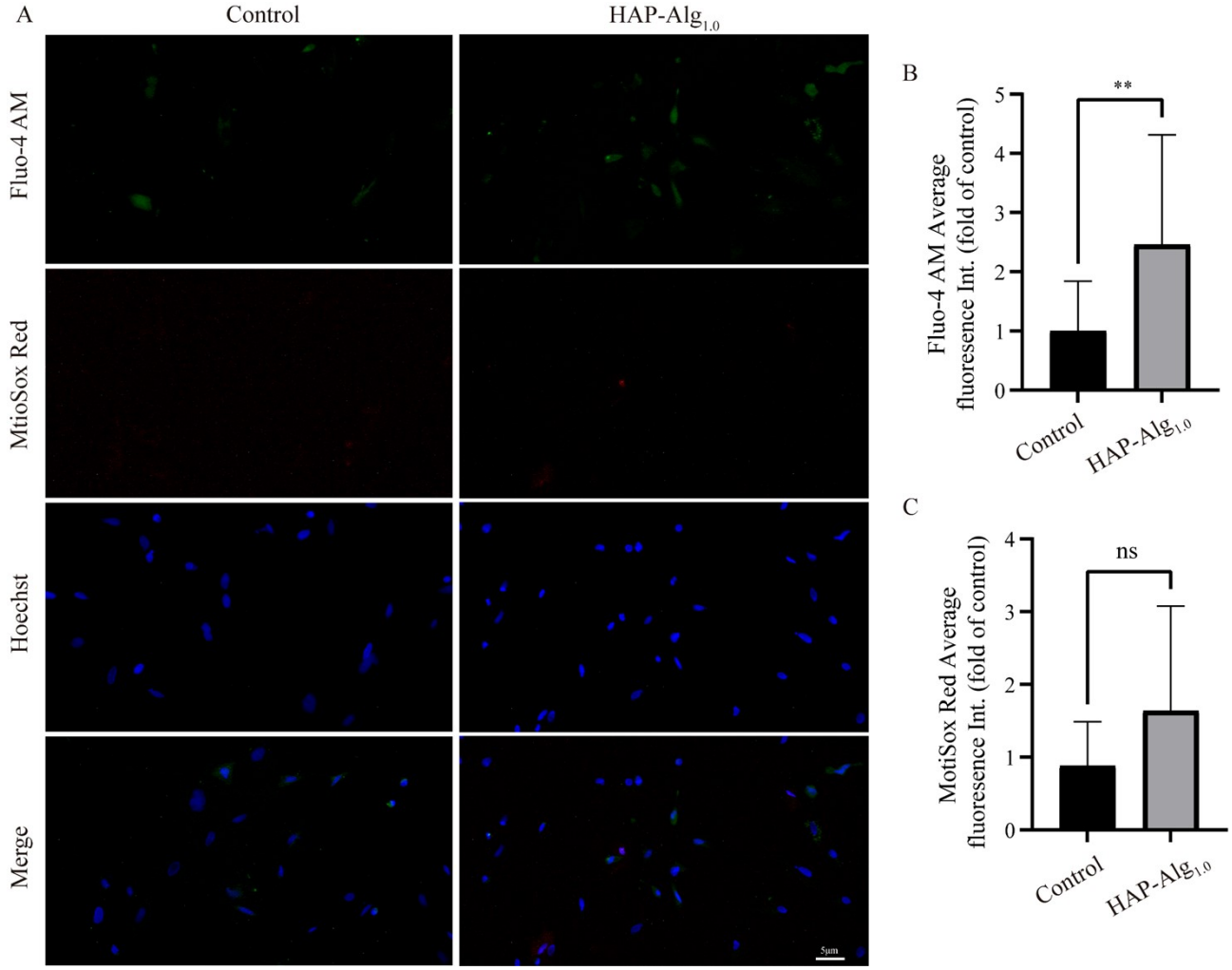
Supplementary Figure S3. TG curves of the freeze-dried HAP-Alg$_x$ composite dressings and the HAP bio-paper.



Supplementary Figure S4. Bright-field images of H1 differentiation into blood vessel organoids on day 8 indicate that the aggregates tend to form extensive radial sprouting, especially under the stimulation of the HAP-Alg_x composite dressing. The control group was treated without the HAP-Alg_x composite dressing. Scale bar = 400 μm.



Supplementary Figure S5. Human vascular organoids (BVOs) with different samples. (A) Number of master junctions of BVOs. (B) Number of master segments of BVOs. (C) Number of branches of BVOs. (D) Total branching length of BVOs. (E) Relative CD31 fluorescence intensity of BVOs to the control. Significant p-values are indicated: *p<0.05, **p<0.01 and #p<0.001 compared with the control group.



Supplementary Figure S6. Flou-4 AM and MitoSOX red staining. (A) Representative images of Flou-4 AM (Green), MitoSox Red (Red) and Hoechst (Blue). (B) Quantification of Fluo-4 AM fluorescence intensity. (C) Quantification of MitoSox Red fluorescence intensity. Significant p-values are indicated: *p<0.05, **p<0.01 compared with the control group. Scale bar = 5 μm.