Supplementary Information

Adhesive and biodegradable polymer mixture composed of high bio-safety pharmaceutical excipients as non-setting periodontal dressing

Xiaodan Zhao,[‡a] Meiwen Li,[‡a] Meng Li,[b] Wenbo Li,[a] Ang Li,[a] Yilong Cheng*[b] and Dandan Pei*[a]

[a]Key Laboratory of Shaanxi Province for Craniofacial Precision Medicine Research, College of Stomatology, Xi'an Jiaotong University, Xi'an, 710049, China

[b]School of Chemistry, Xi'an Jiaotong University, Xi'an, 710049, China

‡These authors contributed equally.

*E-mail: yilongcheng@mail.xjtu.edu.cn

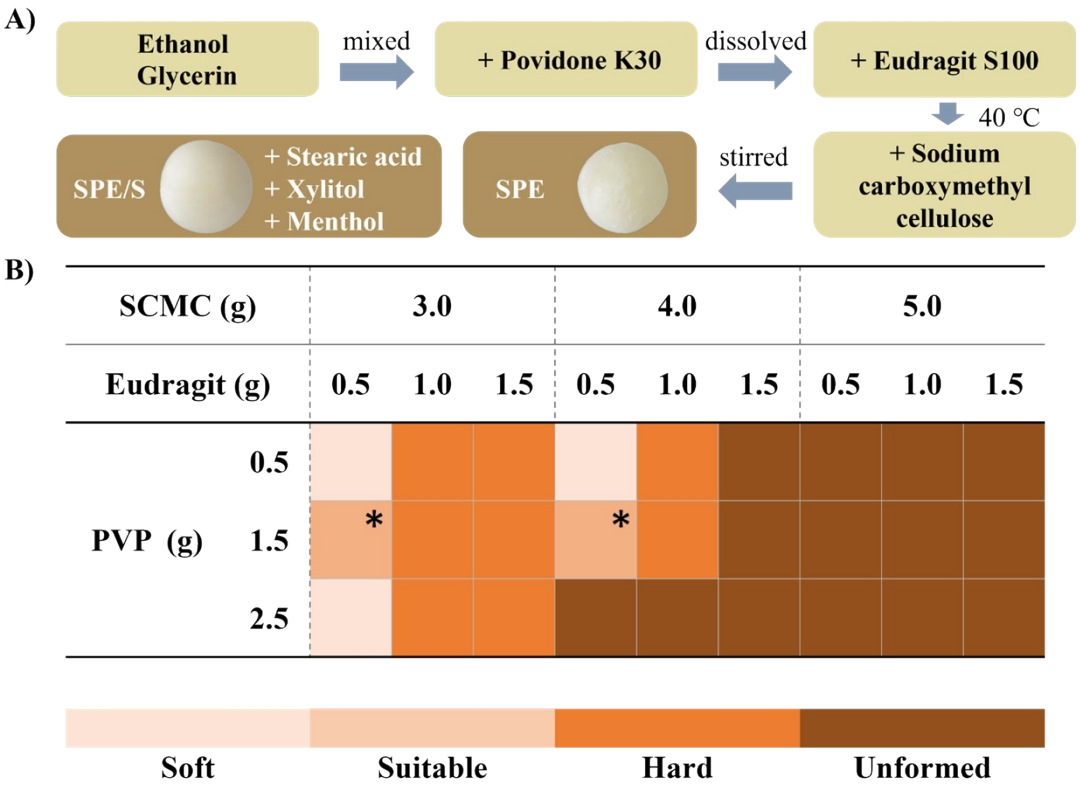

Fig. S1. (A) Schematic illustration of the preparation process of the SPE and SPE/S. (B) Macro traits of SPE with different ratios of solutes. *: ratios of SPE with suitable macro trait.

Table S1. Composition of the optimized mixtures (SPE-1 and SPE-2) and the mixtures with additives (SPE/S-1 and SPE/S-2).

Mixture groups	Solvent (g)	Polymers (g)			Additives (g)
	Ethyl + Glycerin	SCMC	PVP K30	Eudragit S100	Stearic acid + Xylitol + Menthol (20:15:1)
SPE-1	4.0	3.0	1.5	0.5	0.00
SPE-2	4.0	4.0	1.5	0.5	0.00
SPE/S-1	4.0	3.0	1.5	0.5	0.36
SPE/S-2	4.0	4.0	1.5	0.5	0.36

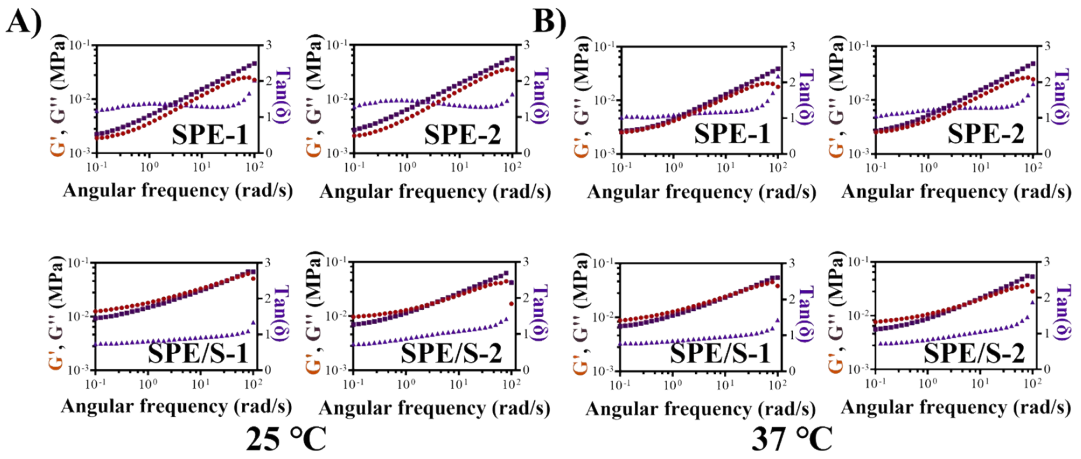

Fig. S2. Angular frequency dependence of storage modulus (G′) and loss modulus (G″) in the linear viscoelastic regime at different temperatures. (A) 25 °C. (B) 37 °C.

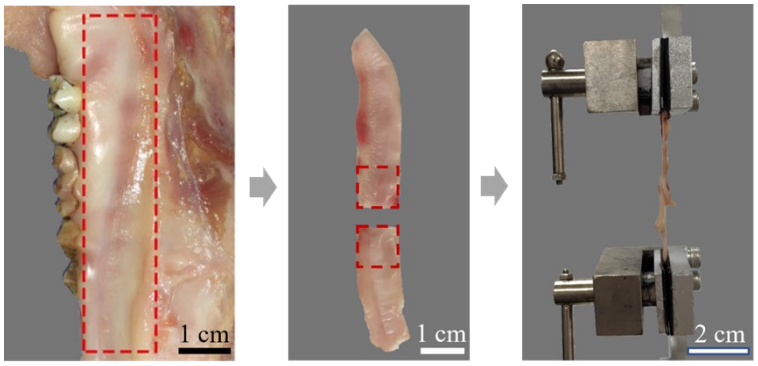

Fig. S3. Experimental set-up for the lap-shear test.

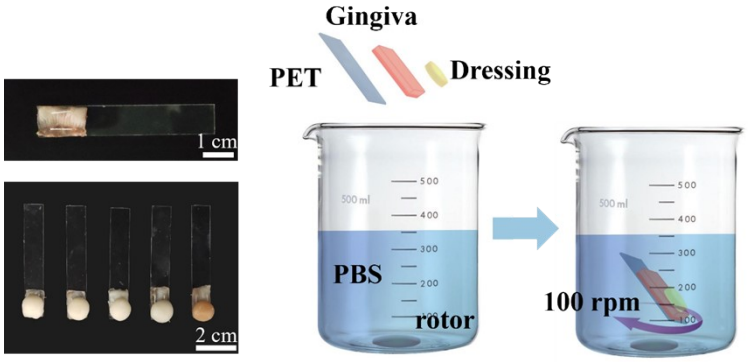

Fig. S4. Experimental set-up for in vitro residence time measurement using the rotating disc method (rotating speed =100 rpm).

Table S2. The pH value of the optimized mixtures (SPE-1 and SPE-2) and the mixtures with additives (SPE/S-1 and SPE/S-2).

Groups	pH value
SPE-1	7.4±0.1
SPE-2	7.5±0.1
SPE/S-1	7.3±0.1
SPE/S-2	7.4±0.1

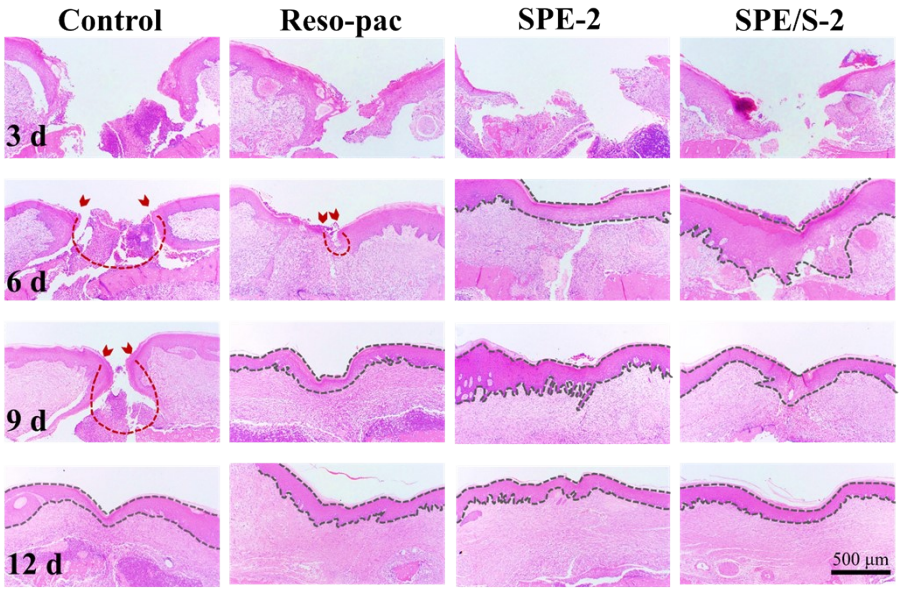

Fig. S5. H&E staining of palate full-thickness defects in SD rats treated with SPE-2, SPE/S-2, Reso-pac® and non-treatment after 3, 6, 9 and 12 days; red arrows and dashed circles indicate tissue defects, grey dashed lines indicate completely epithelium. Scale bar: 500 μm.

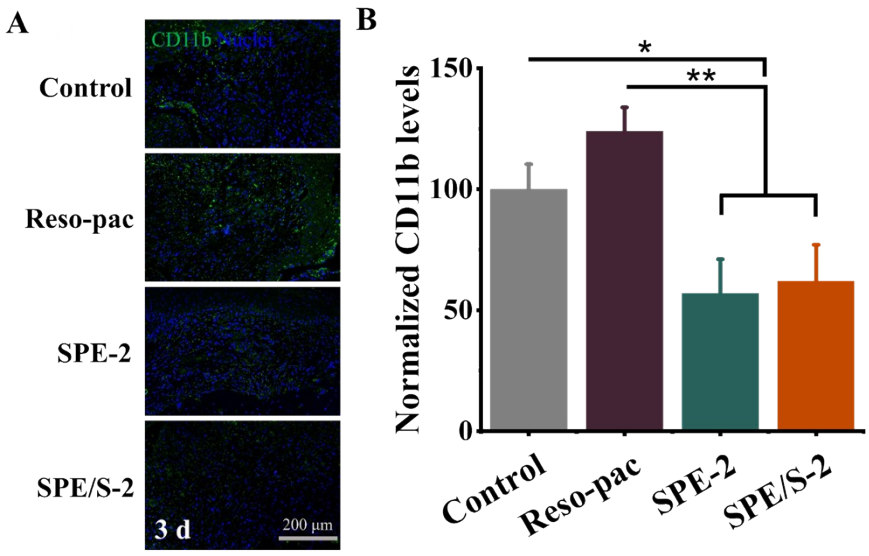

Fig. S6. (A) Immunofluorescence of the palate defects with anti-CD11b (green) after 3 days. Nuclei (blue) was stained with DAPI. Scale bar: 200 μm. (B) Quantitative analysis of cell infiltration by immunofluorescence staining for CD11b. *$P < 0.05$.

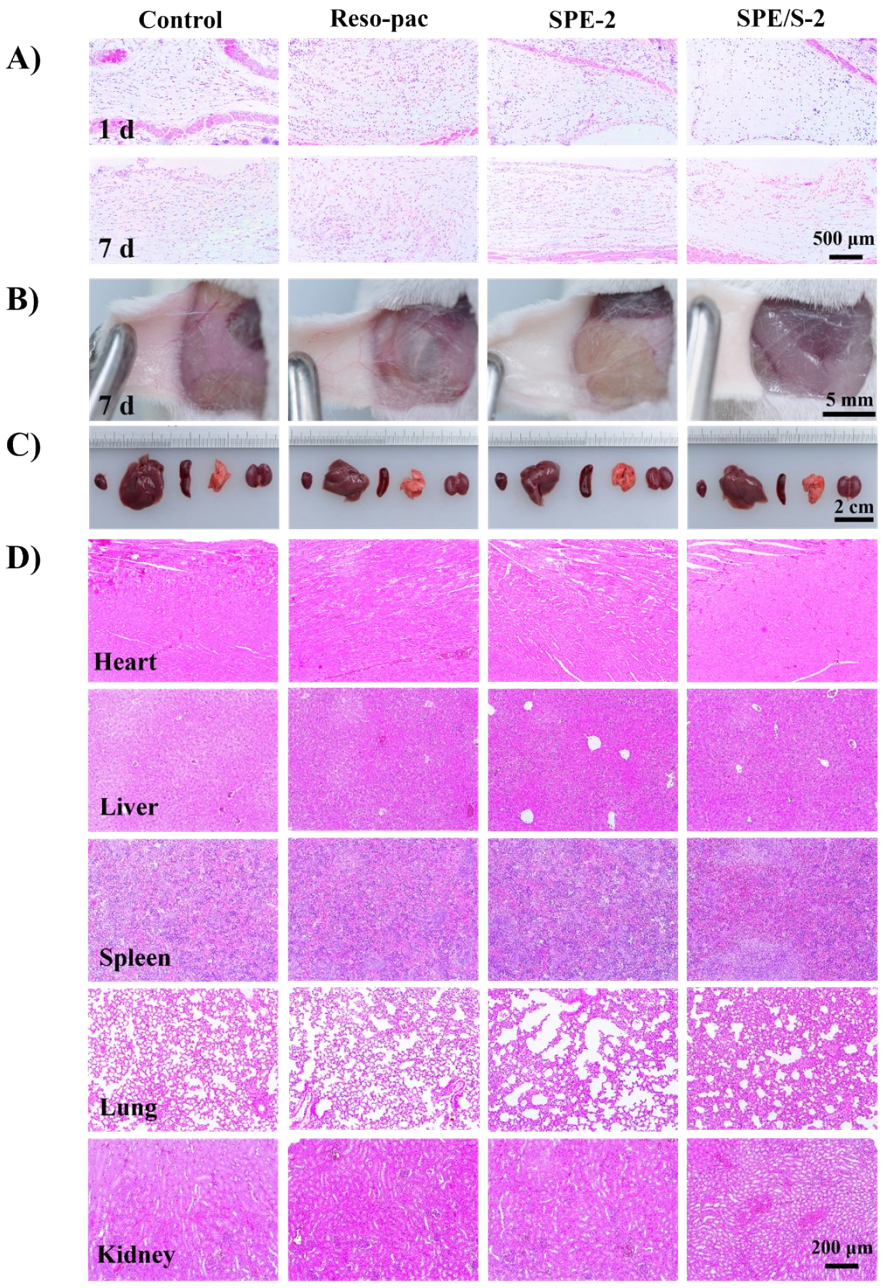

Fig. S7. (A) H&E staining of Kunming mice back tissue after application of different dressings after 1 and 7 days. Scale bar: 500 μm. (B) Representative photographs of mice dorsal skin wounds after 7 days with different treatments. Scale bar: 5 mm. (C) Photographs of major organs (heart, liver, spleen, lung, and kidney) after subcutaneous implantation with different dressings in the backs of Kunming mice for 14 days. Scale bar: 2 cm. (D) H&E staining of major organs (the heart, liver, spleen, lung, and kidney) after subcutaneous implantation with different dressings for 14 days. Scale bar: 200 μm.

Movie S1: The softness and adaptation ability of the SPE-2 dressing.

Movie S2: Adhesion of SPE-2 on porcine gingiva under pouring water. (Water pressure is

about 0.15-0.35 MPa).