Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

PLLA-gelatin composite fiber membranes incorporated with functionalized CeNPs as a sustainable wound dressing substitute promoting skin regeneration and scar remodeling

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The electrospinning parameters

The electrospinning parameters for the production of fiber membranes were shown in **Table S1.**

Table S1. Electrospinning parameters

Polymer concentration	Positive voltage (nozzle)	Negative voltage (collector)	Flow rate	Distance between tip and collector	Temperature
6 wt%	+3.5 kV	-6 kV	0.8 ml/h	20 cm	room

Crosslinking

The fibers membrane was cross-linked with 50 mM 1-(3-Dimethylaminopropyl)-N-ethyl carbodiimide hydrochloride (EDC, Shanghai Macklin Biochemical Co. Ltd) and 20 mM N-Hydroxysuccinimide (NHS, Shanghai Macklin Biochemical Co. Ltd) in 90% (v/v) ethanol for 12 h at room temperature. After three times washing, the fibers membrane was placed in a vacuum drying oven (ZF-6020, Shanghai Jiecheng Experimental Instrument Co., Ltd.) for 24 h to dry again. The final fibers membrane was sealed for use. The parameters of crosslinking process were shown in **Table S2**.

Table S2. Cross-linking process parameters

Crosslinker		***Solvents***		***Reaction conditions***	
EDS	NHS	Ethanol	Deionized water	Temperature	Time
50 mM	20 mM	90% (V/V)	10% (V/V)	RT	12 h

FTIR and XRD analysis

FTIR analysis and XRD pattern for gelatin powder, uncrosslinked, and crosslinked fibers are shown in Figure S1

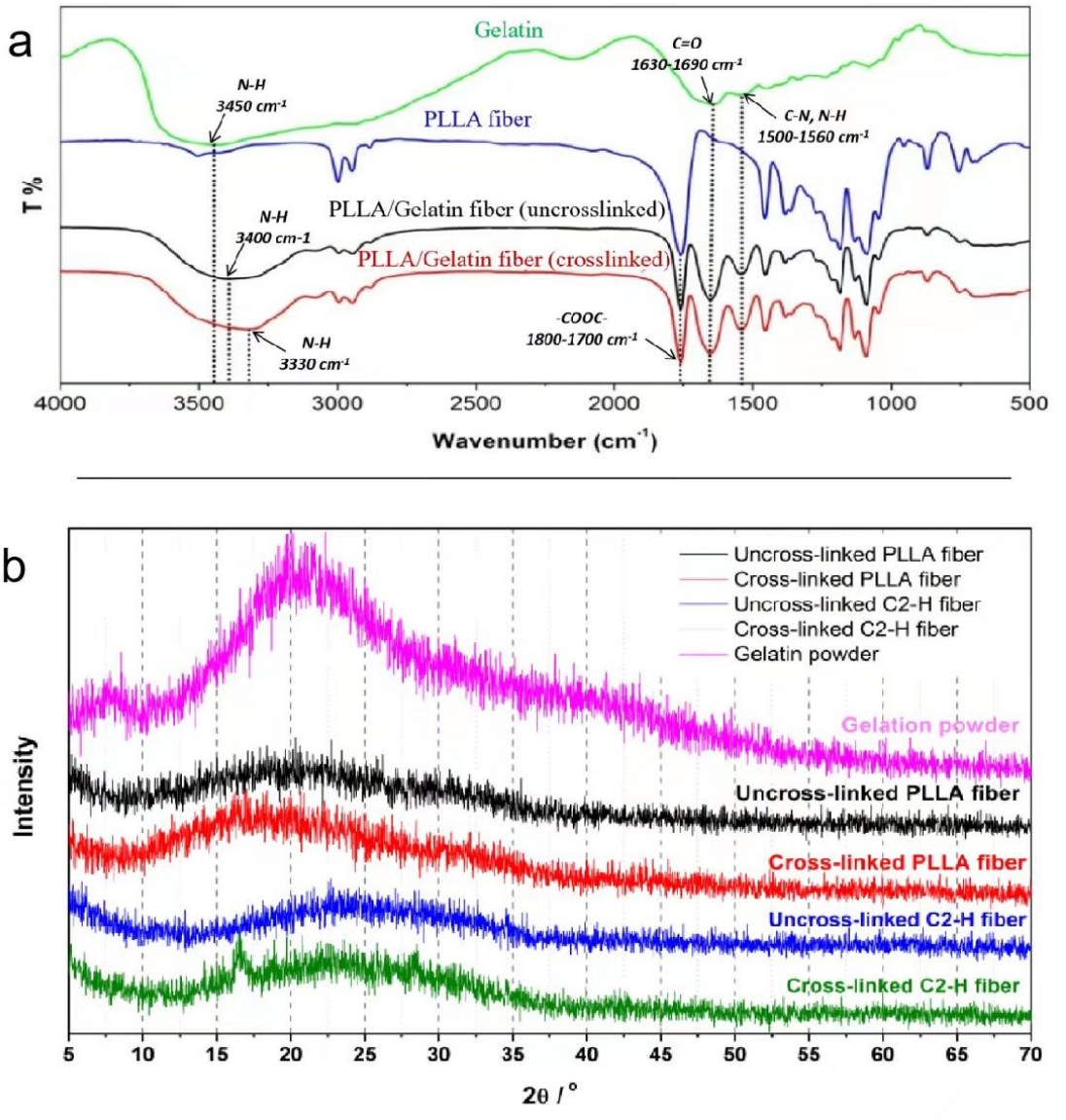

Fig. S1 FTIR spectra (a) and XRD pattern (b) of Gelatin powder, A2, uncrosslinked and crosslinked C2-H fibers

Degradation properties

Table S3. Details of conditions for degradation experiment

Mat size	PBS	Temperature	Rotating speed	container
2 cm×2 cm	50 ml	37°C	100 rpm	50 ml erlenmeyer flask

Table S4. Degradation rate of cross-linked fibers

	C2-H		C2-M		C2-Z		A2	
	Average	SD	Average	SD	Average	SD	Average	SD
0	0	0	0	0	0	0	0	0
1	2.501563	0.088444	8.278437	0.43467	2.787046	0.409949	0.093052	0.131596

3	10.33849	1.475903	37.13878	4.524614	17.49815	0.027606	5.409641	0.713241