

## SUPPORTING INFORMATION

### **Effects of polysiloxane with different molecular weights in vitro cytotoxicity and properties of polyurethane/cotton-cellulose nanofibers nanocomposite films**

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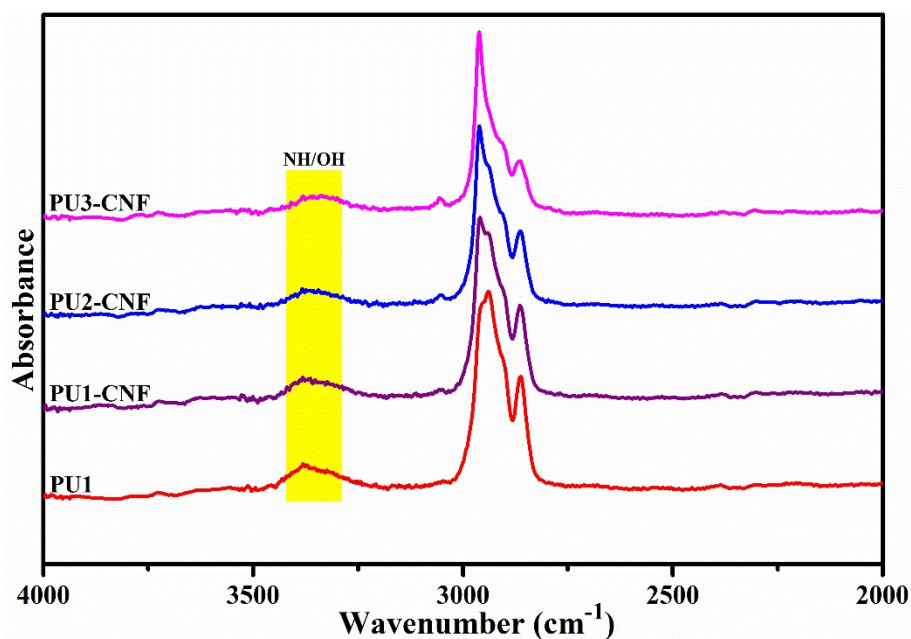
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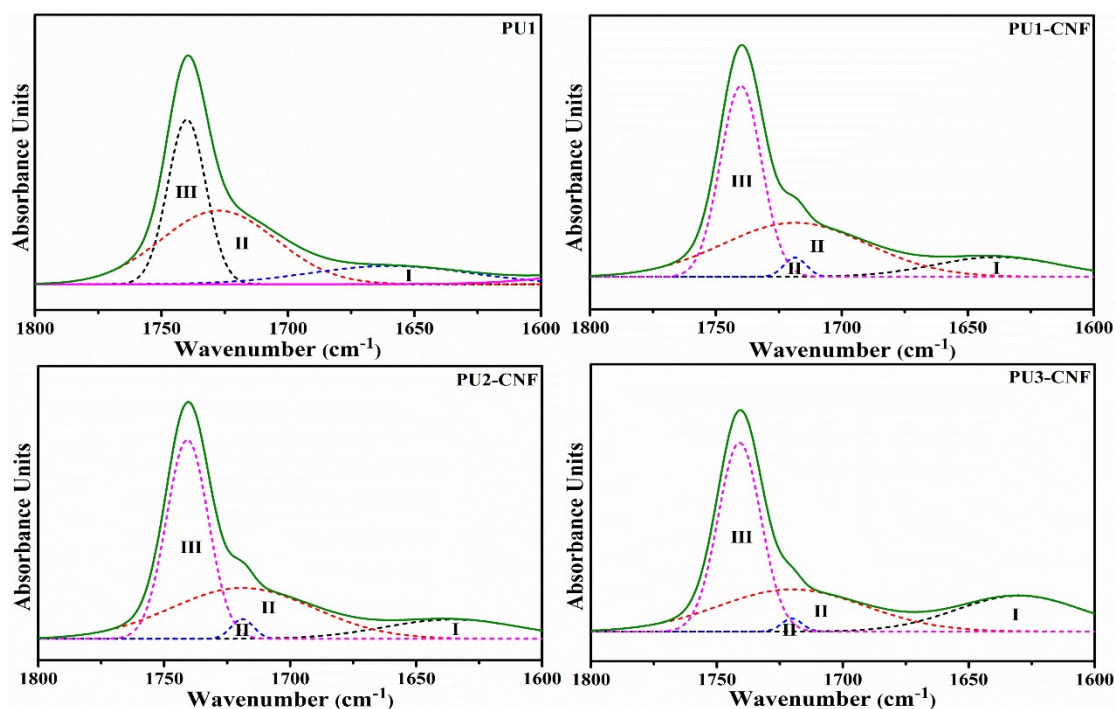
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Material hemolysis and cell adhesion experiment steps are as follows: ① put the sample into a cell culture dish (25 mm) and irradiate it with an ultraviolet lamp for 30 min for sterilization treatment, then add 2 mL of physiological saline, soak it at room temperature for 24h, then take it out, and dry it at room temperature for use. ② vacuum draw 2.0 mL of peripheral blood from a healthy volunteer (male, 36 years old), anticoagulated with 3.2% sodium citrate, centrifuge the anticoagulated whole blood at 1000 rpm for 10 min, and separate the red blood cells in the lower layer and the rich in the upper layer platelet plasma (PRP). Take 0.4 mL erythrocyte pellet into 1.5 mL centrifuge tube and add 1.0 mL physiological saline, mix gently by inverting, centrifuge at 1000 rpm for 10 min, carefully aspirate the supernatant from the centrifuge tube, and then add 0.5 mL of physiological saline to the centrifuge tube to dilute red blood cells, mix upside down and set aside. ③ place the sample in a 1.5 mL centrifuge tube and add 1.0 mL of physiological saline. Then add 20 uL of diluted red blood cell suspension, add 20 uL of diluted red blood cells in 1.0 mL of three distilled water as a positive control group, and add 20 uL of diluted red blood cells in 1.0 mL of physiological saline

as a negative control group. The sample group and the control group are provided with three complex wells. ④ after incubation with a rotary mixer at 37°C for 2h, centrifugation at  $1000 \times g$  for 5 min, 0.2 mL of supernatant is transferred into a 96-well plate, and the absorbance value at 545 nm is measured with a multifunctional microplate reader. (photograph the centrifuge tube to obtain image data). ⑤ relative hemolysis rate calculation formula:  $\text{hemolysis rate (\%)} = (D_t - D_{nc}) / (D_{pc} - D_{nc}) * 100\%$ , in the formula,  $D_t$  is the absorbance of the experimental sample,  $D_{nc}$  is the absorbance of the negative control group,  $D_{pc}$  is the absorbance of the positive control group (photograph the 96-well plate to obtain image data). ⑥ take 5  $\mu\text{L}$  of RPR in step ② on the surface of the sample to be tested with a micropipette, incubate at 37 °C for 40 min, rinse off the PRP gently with physiological saline, and fix it with 4% paraformaldehyde at room temperature for 10 min. Rinse gently with physiological saline twice, rinse once with three distilled water, and dry at room temperature. For platelet adhesion experiments, clean slides are used as positive controls. VK-X150K laser microscope confocal micro-imaging system (Keyence, Japan) is used to observe the adherence morphology of platelets on the surface of samples and slides.



**Fig. S1** FTIR spectra for expanded regions of samples at 4000-2000  $\text{cm}^{-1}$  region.



**Fig. S2** FTIR absorbance spectra of carbonyl peak of polyurethane/cotton-cellulose nanofibers nanocomposite films in the range of 1800-1600 cm<sup>-1</sup>.

**Table S1** Integrated area of the carbonyl peak of polyurethane/cotton-cellulose nanofibers nanocomposite films in the range of 1800-1600 cm<sup>-1</sup>.

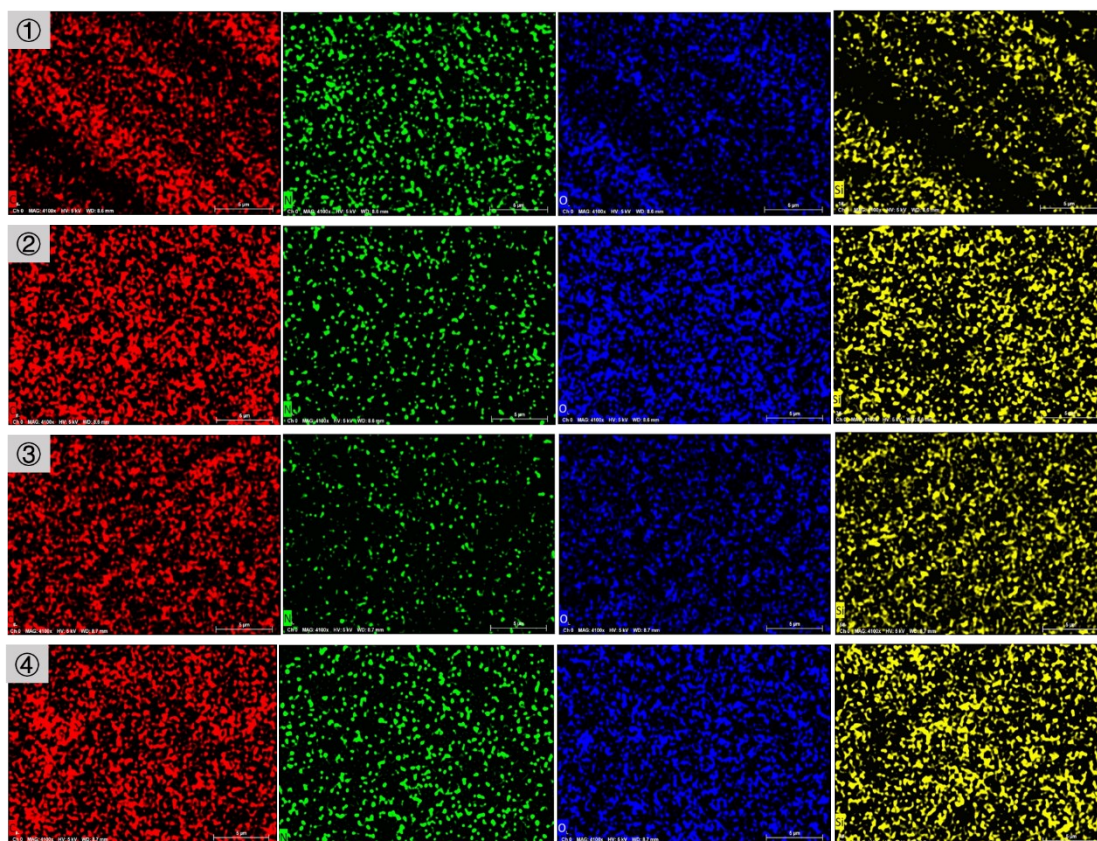
Codes	I	II	III
PU1	2.4	7.5	5.7
PU1-CNF	1.7	6.2	6.0
PU2-CNF	1.4	4.7	4.9
PU3-CNF	1.7	2.7	3.4

According to the calculation formula in the literature of Borja Ferná'ndez d' Arlas,<sup>1</sup> the hydrogen bond fraction of urethane carbonyl groups is Xb:

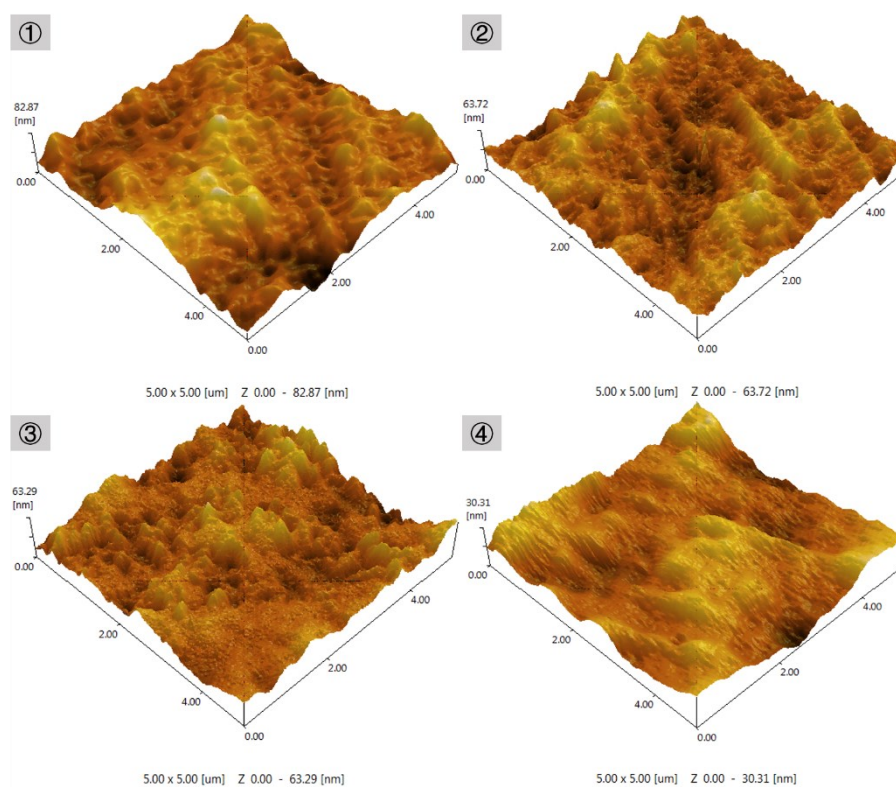
$$Xb = \frac{Ab}{K' Af + Ab}$$

Ab: the absorbance area of hydrogen bonded urethane carbonyl group. Af: the absorbance area of free urethane carbonyl group. Take K' = 1 here.

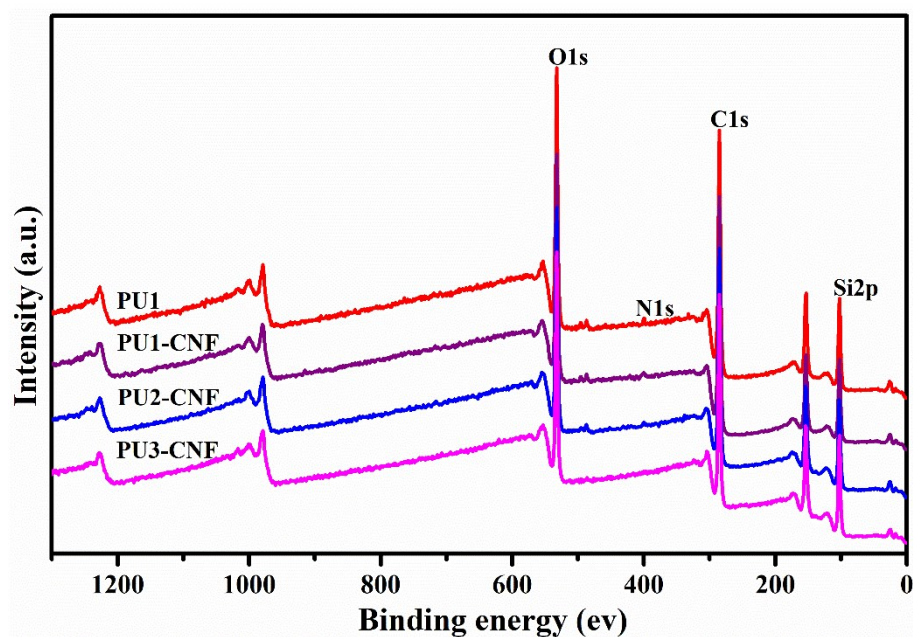




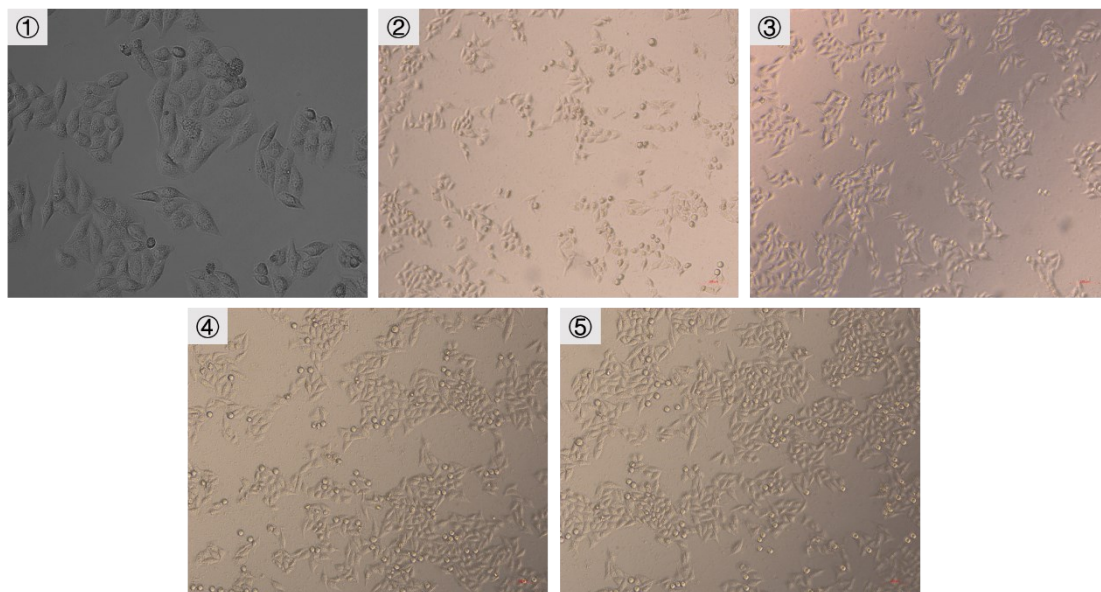
**Fig. S3** Mapping image of polyurethane/cotton-cellulose nanofibers nanocomposite films: ①: PU1, ②: PU1-CNF, ③: PU2-CNF, ④: PU3-CNF and C (red), N (green), O (blue), Si (yellow).



**Fig. S4** AFM-3D analysis of polyurethane/cotton-cellulose nanofibers nanocomposite films: ①: PU1, ②: PU1-CNF, ③: PU2-CNF, and ④: PU3-CNF.

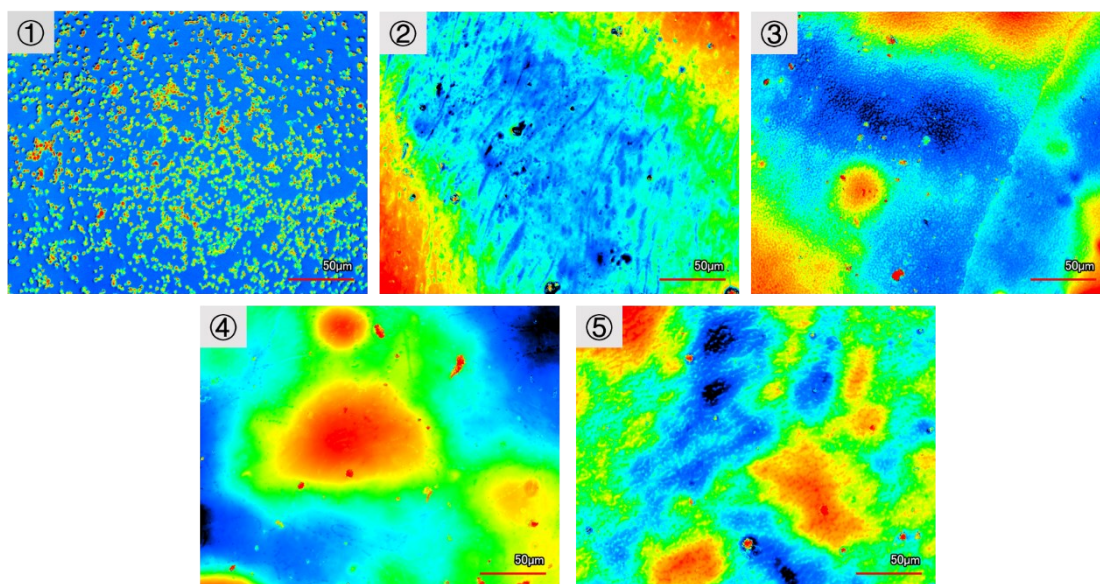


**Fig. S5** XPS of polyurethane/cotton-cellulose nanofibers nanocomposite films.

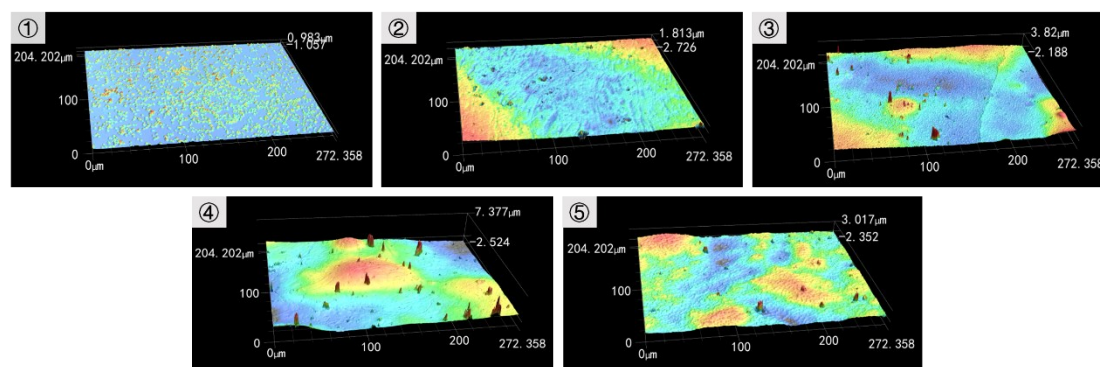


**Fig. S6** HeLa cells growth observation in blank and presence of polyurethane/cotton-cellulose nanofibers nanocomposite after incubation at 37°C for 24 h: ①: PDMS-1000, ②: PU1, ③: PU1-CNF, ④: PU2-CNF, and ⑤: PU3-CNF.





**Fig. S7** Height morphology of platelet adhesion test results of polyurethane/cotton cellulose nanofiber nanocomposite film. ①: platelet adhesion test results on clean slides are positive controls, ②: PU1, ③: PU1-CNF, ④: PU2-CNF and ⑤: PU3-CNF.



**Fig. S8** 3D morphology of platelet adhesion test results of polyurethane/cotton cellulose nanofiber nanocomposite film. ①: platelet adhesion test results on clean slides are positive controls, ②: PU1, ③: PU1-CNF, ④: PU2-CNF and ⑤: PU3-CNF.

## Notes and references

1. B. Fernández d'Arlas, L. Rueda, K. de la Caba, I. Mondragon and A. Eceiza, *Polymer Engineering & Science*, 2008, 48, 519-529.