Supplementary Information

Nanofibrous polylactide composite scaffolds with electroactivity and sustained release capacity for tissue engineering

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Experimental

XRD, FT-IR, and UV-vis measurement

The X-ray diffraction (XRD) measurements for drugs and nanoparticles were performed on a Rigaku SmartLab (3) X-ray diffractometer at room temperature.

FT-IR spectra of ibuprofen, rutin and the drug-loaded PUU nanoparticles were obtained with a Nicolet 6700 FT-IR spectrometer (Thermo Scientific Instrument) in the 4000-600 cm^{-1} range. The spectra were taken as the average of 32 scans at a resolution of 4 cm^{-1}.

The UV-visible spectra of ibuprofen, rutin and the drug-loaded PUU nanoparticles in DMF solution were obtained from a UV-vis spectrophotometer (PerkinElmer Lambda 35).

Degradation method of PUU nanoparticles

PUU nanoparticles were electrosprayed onto tinfoil. For enzymatic degradation experiment, the tinfoil was cut into square pieces (3×3 cm^2) and weighted. Tris/HCl buffer (pH 8.6 at 37 °C) was prepared from water solution of Tris base and hydrochloric acid. 0.02 wt% of sodium azide was dissolved in the buffer. Each sample was immersed in a vial of 5 mL Tris/HCl buffer containing 1 mg of proteinase K. The vials were placed in a 37 °C shaker with rotating speed of 100 rpm. The buffer and proteinase K were replaced every 24 h to maintain the activity. Specimens were withdrawn at predetermined time, washed with deionized water, dried in an oven at 50 °C overnight and vacuum dried for 2 d to remove moisture. Dry specimens were weighed and weight loss was calculated by the following formulation:

Weight loss (%) = $(W_0 - W_t)/W_0$

Where W_0 stands for the original weight of PUU nanoparticles. W_t is the dry weight of specimen during degradation.

Figures

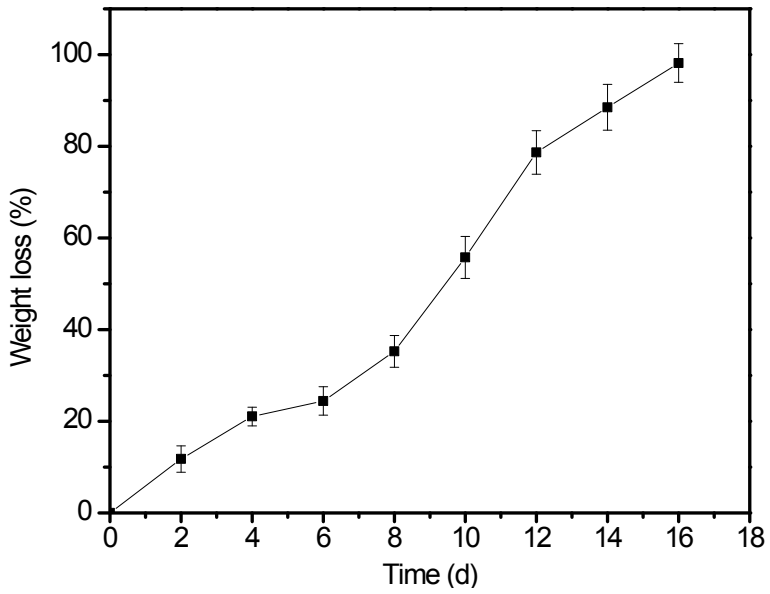

Figure S1. The degradation profile of PUU nanoparticles at 37 °C in enzymatic environment.

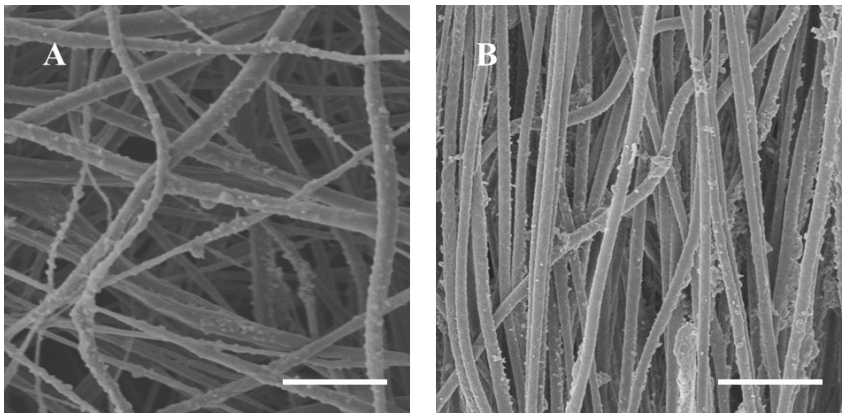

Figure S2. SEM images of (A): random PLA nanofibers/ PLA nanoparticles, and (B): aligned PLA nanofibers/ PLA nanoparticles. Scale bar = 20 μm.

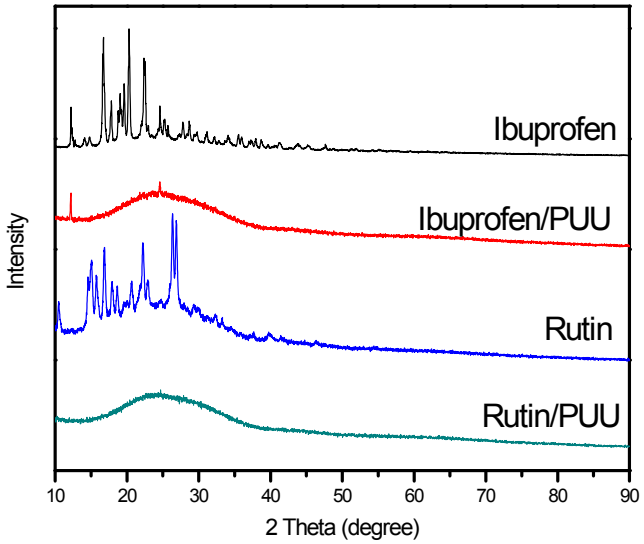

Figure S3. XRD patterns of model drugs and drug-loaded PUU nanoparticles.

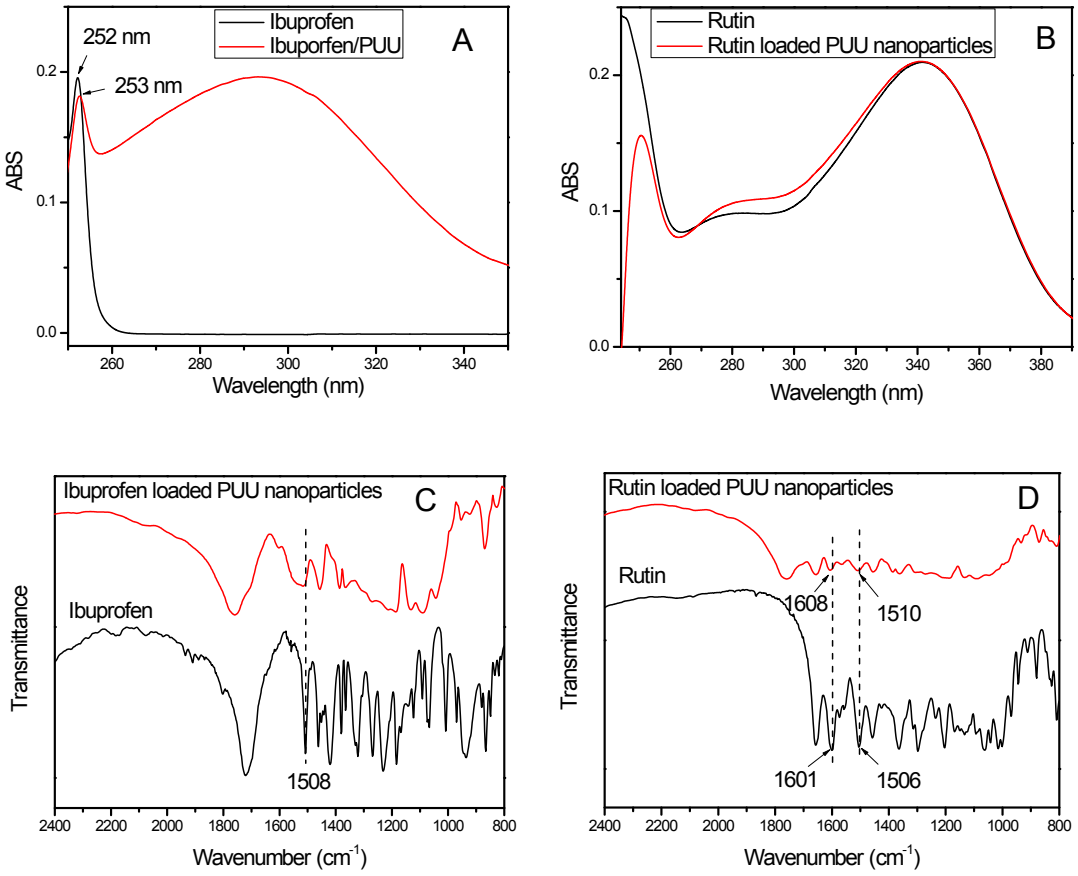

Figure S4. UV-vis (A, B) and FT-IR (C, D) spectra of model drugs and drug-loaded PUU nanoparticles.

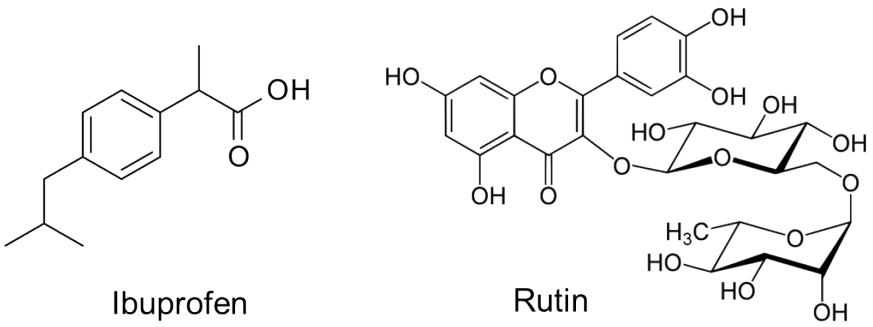

Figure S5. Molecular structures of ibuprofen and rutin.