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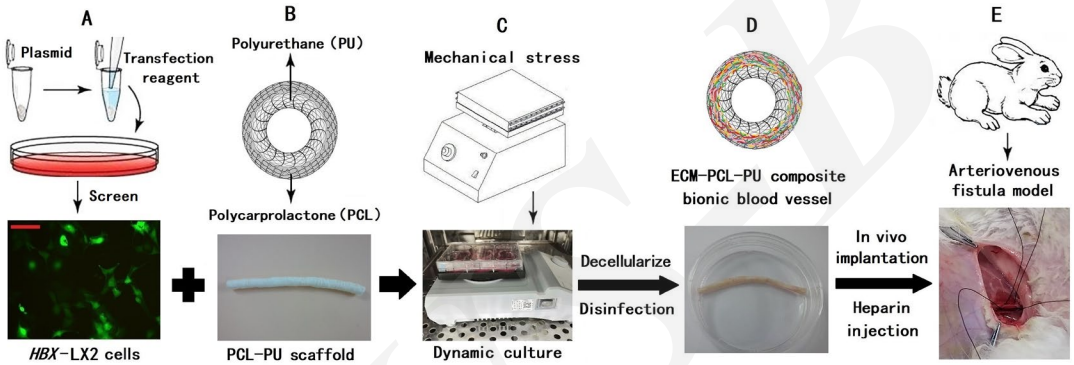
Hemodialysis bilayer bionic blood vessels developed by the mechanical stimulation of hepatitis B viral X (*HBX*) gene-transfected hepatic stellate cells

Key words: composite bilayer bionic blood vessels; extracellular matrix (ECM); hepatic stellate cells (HSCs); hepatitis B viral X (*HBX*) gene; mechanical force

Research Summary

This article mainly focused on the preparation of human-derived ECM-PCL-PU artificial vascular scaffolds for dialysis:

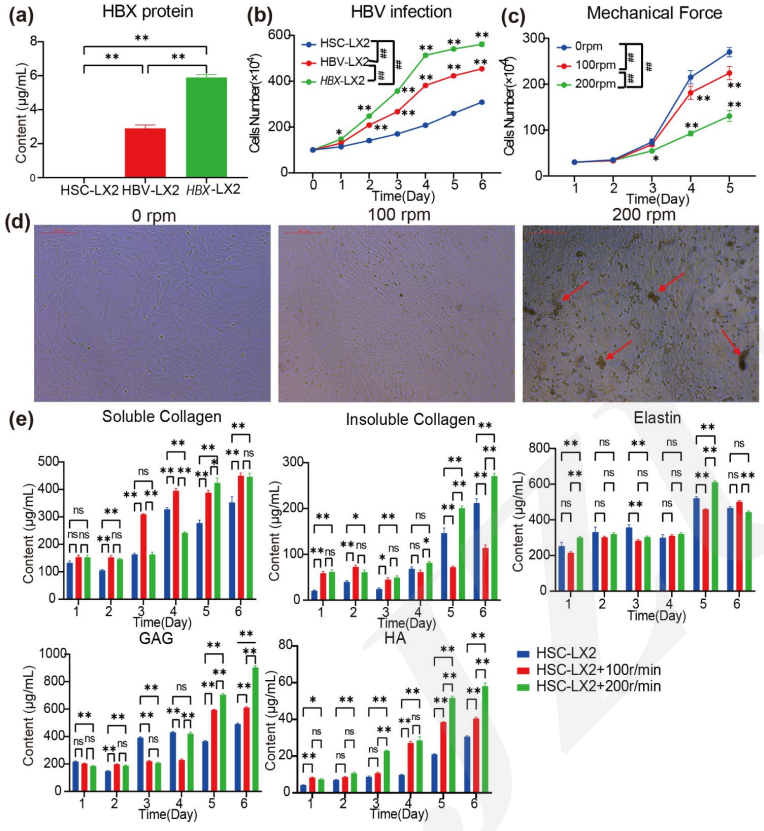


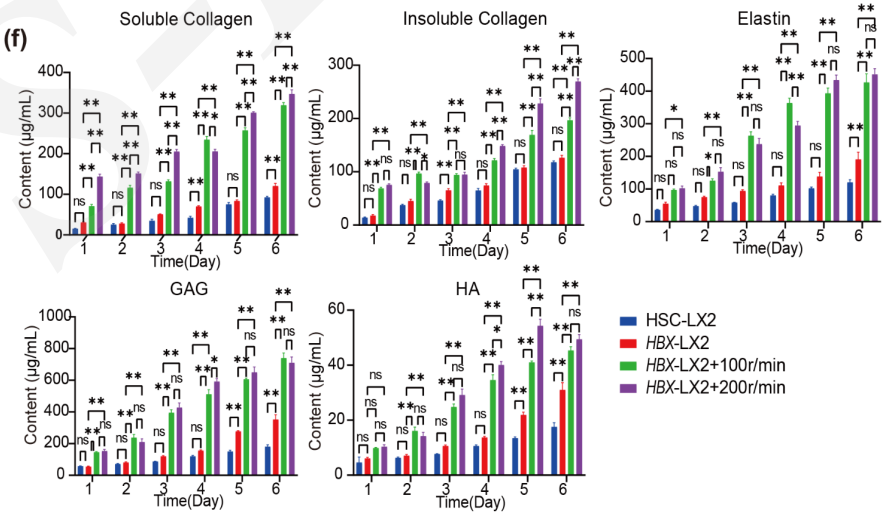
Article Highlights:

1. Preparation of a bilayer vascular scaffold with a dense inner layer and a porous outer layer, which is suitable for cell growth and adhesion.
2. Mass production of human ECM in vitro using HBX-LX2 cells inspired by the mechanism of HBV-induced liver fibrosis.
3. In vitro mass production of orderly growing ECM fibers and subsequent fusion with the porous layer of the bilayer vascular scaffold under the combined effect of HBX and mechanical force, in order to construct artificial blood vessels for dialysis with stiffness similar to natural blood vessels.

Innovation points

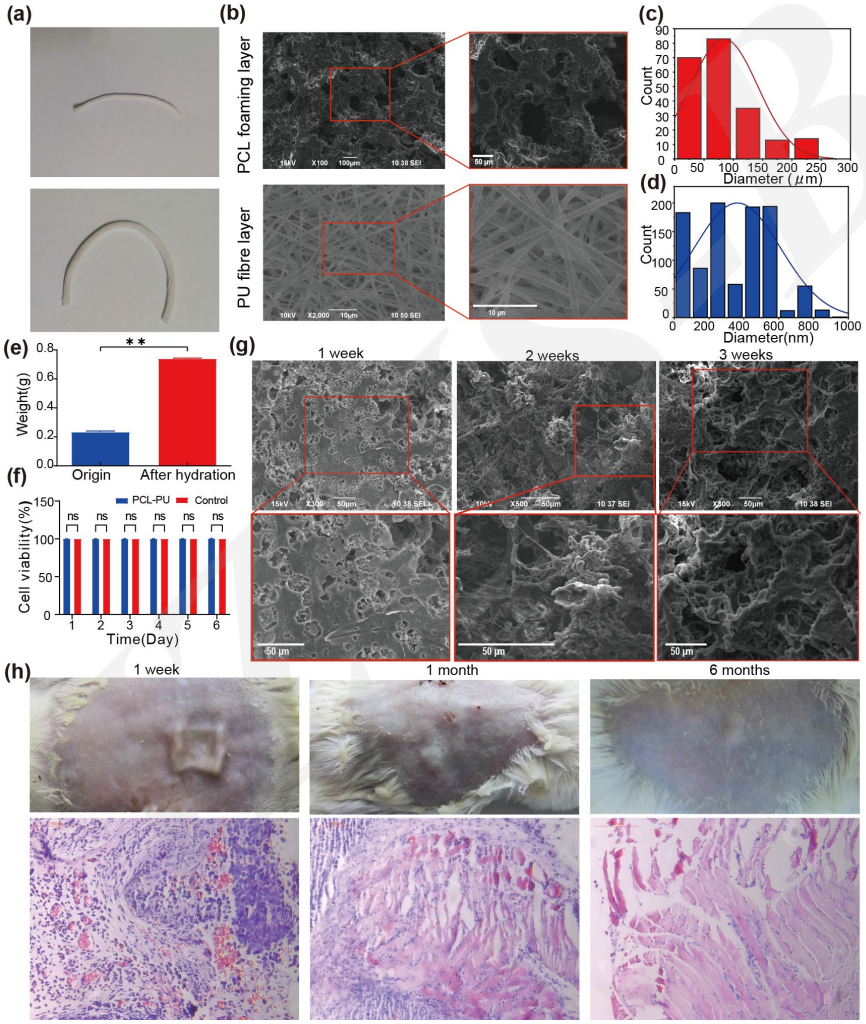
- **Cell line development and evaluation**





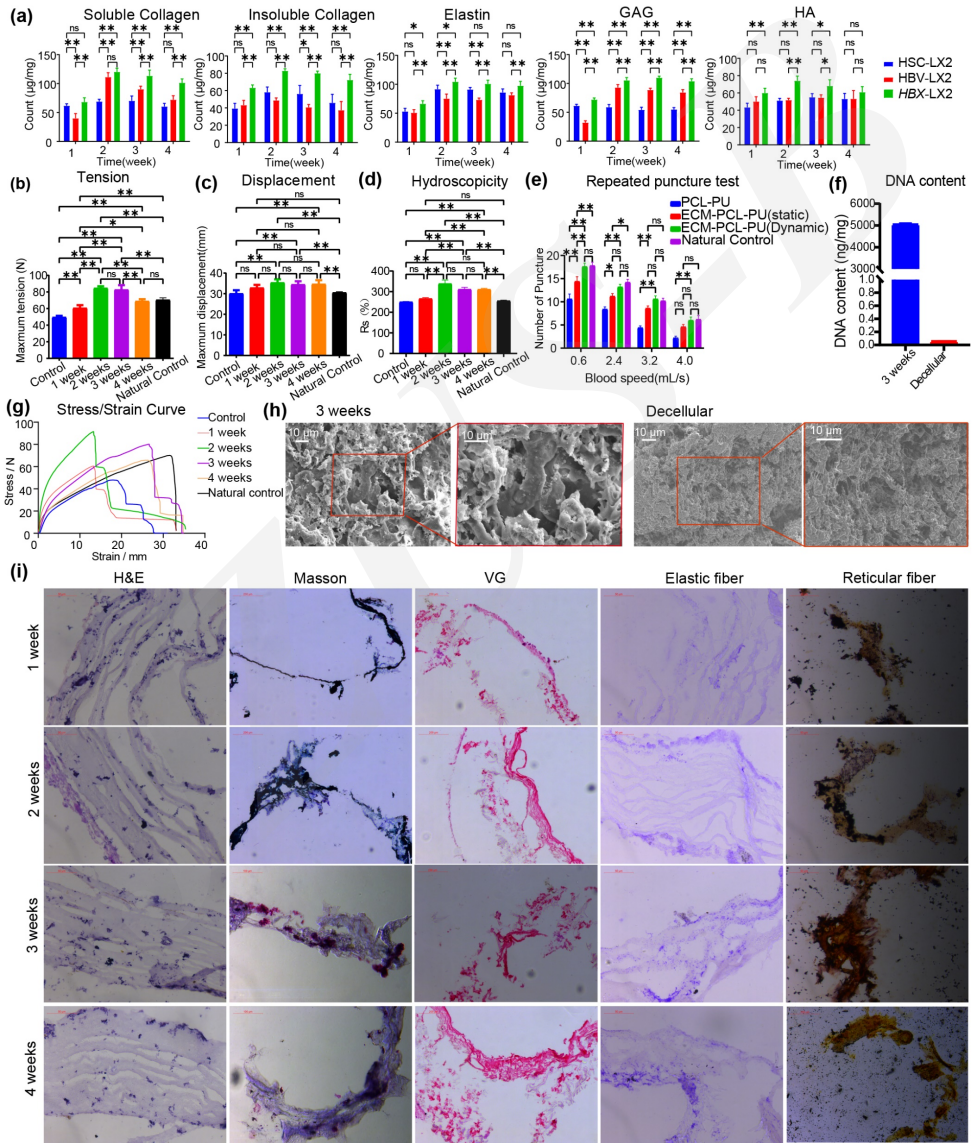
Innovation points

- **Preparation and characterization of PCL-PU bilayer vascular scaffolds**



Innovation points

- **Preparation and detection of human-derived ECM-PCL-PU vascular scaffolds**



Innovation points

- **Bio-vascularization of rabbit neck graft using a human-derived ECM-PCL-PU**

