Single-step Imprint of Controllable Honeycomb Patterns on Polymeric Substrate as Scaffold for Cell Growth

부반티엔, 최호석†
충남대학교
(hchoi@cnu.ac.kr†)

We report on a single-step method to directly imprint ordered porous structure on surface of polymeric substrates including cell culture Petri dish. In this work, a mixture of solvent (chloroform) and nonsolvent (methanol) is exploited to induce not only polymer solution layer but also phase separation, and consequently resulting in formation of honeycomb ordered structure. It is realized that the developed strategy is very simple but highly efficient for fabricating patterned substrates owning to its free-additional humidity and external polymer solution required. The surface morphology of the patterned substrates such as pore size, pore shape and pore number density are effectively controlled by adjusting mixture solvent composition and retention time of sample in the mixture. The obtained honeycomb porous structure is indeed a part of the polymer substrate which shows good mechanical stability and chemical resistance after applying UV-crosslink of substrate. Moreover, the patterned Petri dishes fabricated via this method can find application potential in biotechnology while they show good cell proliferation.