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3D CELL CULTURE SCAFFOLDS

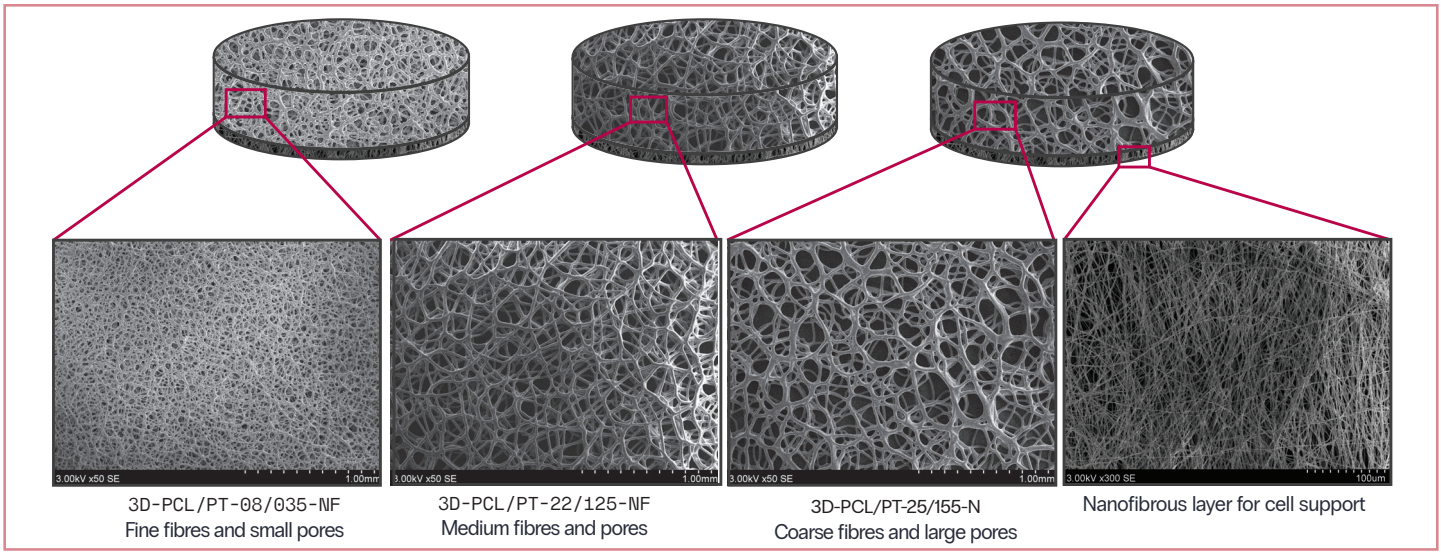
GROWTH AND INTERACTIONS IN ALL THREE DIMENSIONS

Product concept

3D cell culture scaffolds designed as two-layer constructs:
- The top layer features a unique matrix of fibres and pores fabricated by the proprietary 3D fibre printing method, and serves as a matrix hosing cells.
- The bottom layer features a dense network of nanofibres forming a cell impenetrable membrane, preventing cell migration to the well floor.

Such design provides a favourable environment for cell attachment and proliferation. The round fibre and pore morphology follows a random structure of natural extracellular matrix (as compared to straight/aligned fibre and filament structures). Large pores allow for an efficient cell distribution throughout the entire scaffold height.

Unique and Fine-tuned Scaffold Morphology



3D-PCL/PT-08/035-NF
Fine fibres and small pores

3D-PCL/PT-22/125-NF
Medium fibres and pores

3D-PCL/PT-25/155-N
Coarse fibres and large pores

Nanofibrous layer for cell support

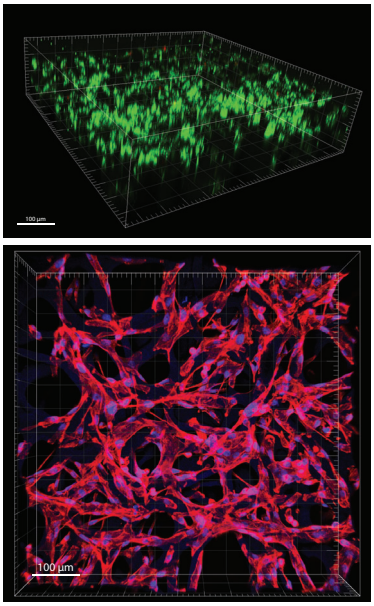
Bious life **3D cell culture scaffolds**

Specifications:
Construction: 3D, 2-layer (nanofibre bottom)
Basis polymer: Poly(ε-caprolactone), plasma-treated

SKU: **3D-PCL/PT-08/035-NF**
Fibre diameter (mean) 8 µm
Pore diameter (mean) 35 µm

SKU: **3D-PCL/PT-22/125-NF**
Fibre diameter (mean) 22 µm
Pore diameter (mean) 125 µm

SKU: **3D-PCL/PT-25/155-NF**
Fibre diameter (mean) 25 µm
Pore diameter (mean) 155 µm



Confocal microscopy images of MDA-MB-231 cells in scaffold

Features
- Tunable morphology
- Cut-to-size
- Easy imaging
- UV-sterilized and ready to use
- Compatible with most current 2D assays

Applications
- Drug screening
- Environmental cytotoxicity
- Tissue engineering
- Organ-on-chip models

Modifications
- Wetting properties
- Cold plasma surface activation
- Attachment of functional molecules (growth factors)

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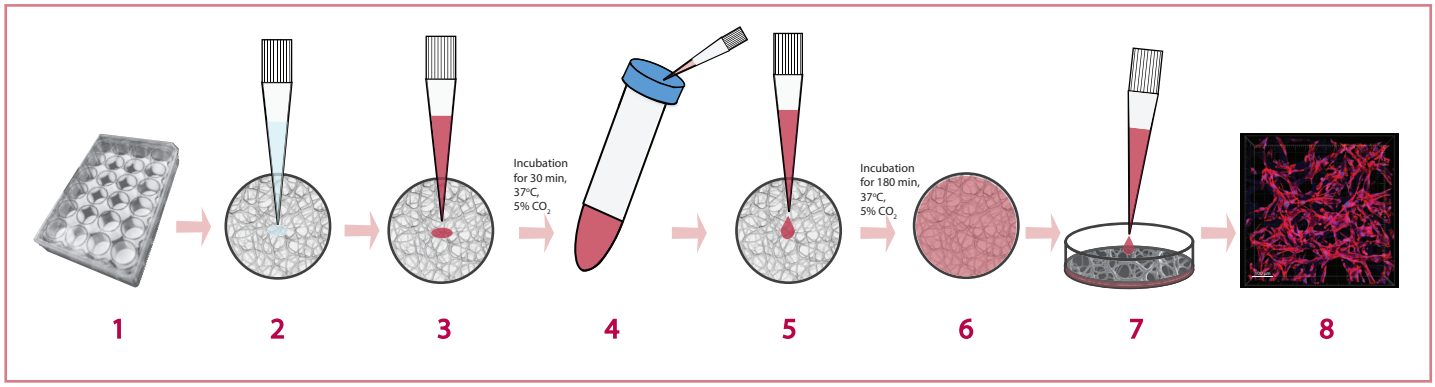
Selectable options

Scaffold diameter	21, 15, 5 mm (fits 12, 24, 96 well plates, possible to use w or w/o support holders)
Scaffold thickness	200 ± 20 µm
Fibre diameter	10 – 200 µm
Pore diameter	15 – 500 µm
Morphology	round interconnected pores
Water contact angle	40° – 70°

Method work flow



1. Unpack test-plates in a laminar flow box and inspect visually.
2. Fill wells with 70 % ethanol for 20 min and then aspirate. Wash with sterile PBS (three-times).
3. Pre-wet wells with culture media: add culture media, incubate for at least 30 min and aspirate the medium.
4. Prepare cell suspension in a required density and pipette the appropriate volume of cell suspension (refer to 3D cell seeding protocol).
5. Carefully place cell suspension droplet onto the centre of the well surface.
6. Allow droplet to distribute through the entire scaffold.
7. Refill the wells with culture media and change the media every 3 – 4 days.
8. Perform selected analytical procedures.

Common protocols for 2D cultures may be adapted to 3D cultures. Scaffolds are compatible with both assays.

Recent application: https://doi.org/10.1016/j.bej.2022.108531

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