Supplementary information for:

**3D printed filtration and separation devices with integrated membranes and no post-printing assembly**

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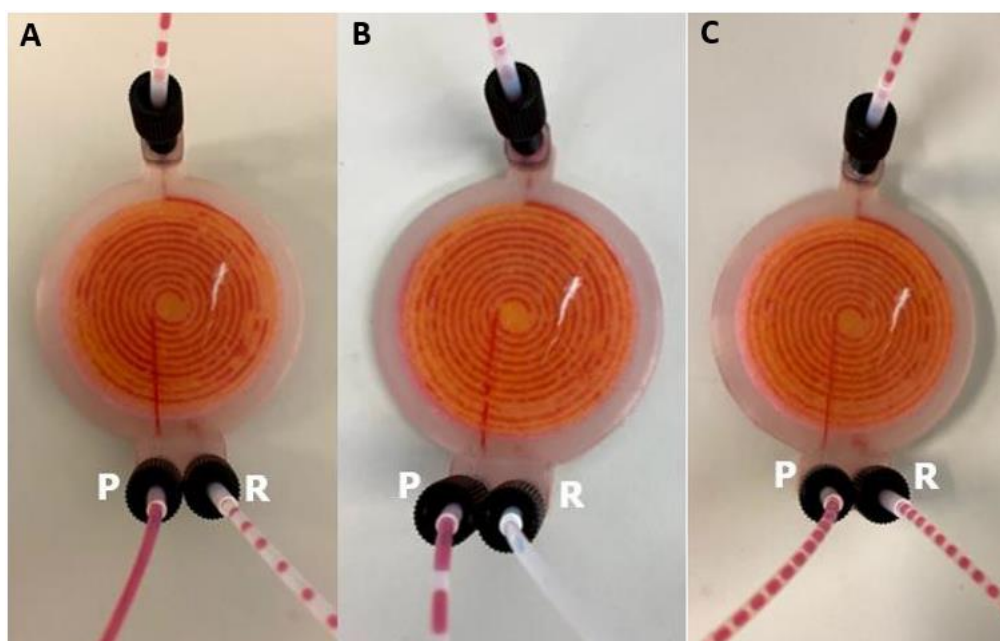*Email: a.nightingale@southampton.ac.uk

Figure 1: Various separation outcomes of the liquid-liquid separator using an MCE membrane where water is red and FC-40 oil is clear. The permeate and retentate channels are represented by P and R, respectively. A) shows incomplete permeation of water from the retentate stream due to insufficient pressure difference across the membrane; B) shows FC-40 permeating the membrane due to too large a pressure difference and C) shows segmented flow in both channels, which occurs at very high flow rates, with the high pressures forcing the FC40 across, while the short residence time meaning the water phase does not have time to fully permeate through.

| Scan Stage | Peak Voltage (kV) | Power (W) | SOD (mm) | SDD (mm) | Obj. | Bin. | Exp. (s) | Proj. / FPP | Voxel Resolution (μm) |
|---|---|---|---|---|---|---|---|---|---|
| Low resolution | 110 | 10 | 25 | 175 | 0.4X | 1 | 6 | 3201 / 1 | 5.0 |
| High resolution | 110 | 10 | 25 | 42 | 4X | 2 | 4 | 1601 /1 | 2.5 |

Table 1: The parameters used for μCT scan. SOD = source-to-object distance, SDD = source-to-detector distance, Obj. = magnification objective, Bin. = binning, Exp. = exposure time, Proj. = number of projection images, and FPP = frames per projection.