Electronic Supporting Information (ESI)

A 3D-Printed Microcapillary Assembly for Facile Double Emulsion Generation

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Figure 1S

Glass capillary assembly. (a-d) Inner capillaries assembled in both a square and round outer capillary and 3D printed connectors used for their assembly.

Figure 2S

Method used to establish the offset of the capillary centres in both the traditional assembly and our approach. In this specific case, the measured offset is equal to 0.9 (arbitrary units).
Flow domains. (a) Manifestation of different formation domains by varying the inner droplet flow rate: oil droplet, water phases merging, double emulsion with 1 encapsulated droplet (DE1), with 2 encapsulated droplets (DE2) and with 3 encapsulated droplets (DE3); (b-d) 3D charts showing the complete flow rate dependence of the different formation domains in each of the three configurations. (b) In configuration I stable double emulsion with 1 encapsulated droplet occurs at a flow rate equal to 3 µl min⁻¹; (c) in configuration II stable double emulsion with one and two encapsulated droplets occur respectively at 3 and 9 µl min⁻¹; (d) in configuration III stable double emulsion with three encapsulated droplets occurs at 8 µl min⁻¹
Figure 4S

PEEK nut and screw fabricated using CNC milling technique (DMU 50T Deckel Maho, DMG Mori Seiki AG).

Table S1 shows the coefficients of variation of the inner droplets (single, double and triple encapsulation) during stable double emulsion generation for the three configurations studied.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>N.1</th>
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<tbody>
<tr>
<td>I</td>
<td>10</td>
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<tr>
<td>II</td>
<td>6</td>
<td>7</td>
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<td>III</td>
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Videos

Configuration I Single_Encapsulation.avi
Configuration II Single_Encapsulation.avi
Configuration II Double_Encapsulation.avi
Configuration III Triple_Encapsulation.avi
Distance_adjustment_slow_motion.avi

CAD/Inventor Files

3D Printed Assembly

Files for the 3D printing of the presented assembly. Examples of both round and square holders.

- 3D Holder Assembly.dwg
- 3D Print Holder.stl
- 3D Print Nut Square.stl
- 3D Print Nut Square.stl
- 3D Print Nut Screw.stl

PEEK Assembly
Files for conventional CNC milling.

- ALU Holder.ipt / ALU Holder.stp
- PEEK Nut.ipt / PEEK Nut.stp
- PEEK Screw.ipt / PEEK Screw.stp