Electronic Supplementary Material (ESI) for RSC Advances.


# Electronic Supplementary Information

# Immobilised-enzyme microreactors for the identification and synthesis of conjugated drug metabolite

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# ESI 1 – Microfluidic Chip designs

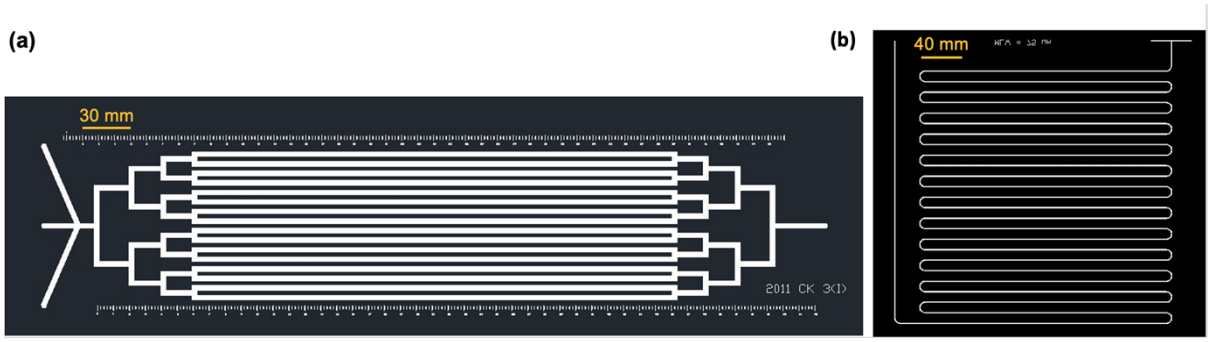


**Figure S1**: **AutoCAD drawing of channel designs.** (a) Chip Design A (parallel channel network) and (b) Chip Design B (serpentine channel).

**Table S1**: Specifications for parallel and serpentine chip designs.

| | **Chip Design A** (parallel channels) | **Chip Design B** (serpentine channel) |
|---|---|---|
| Channel length (mm) | 50 | 667 |
| Channel width (μm) | 300 | 75 |
| Channel etch (μm) | 30 | 30 |
| Retention time (min) at a flow rate of 0.1 μL $min^{-1}$ assuming width at half depth | 76 | 18 |
| Surface area to volume ratio ($m^{-1}$) | 5400 | 150 |

# ESI 2 - Experimental Setup

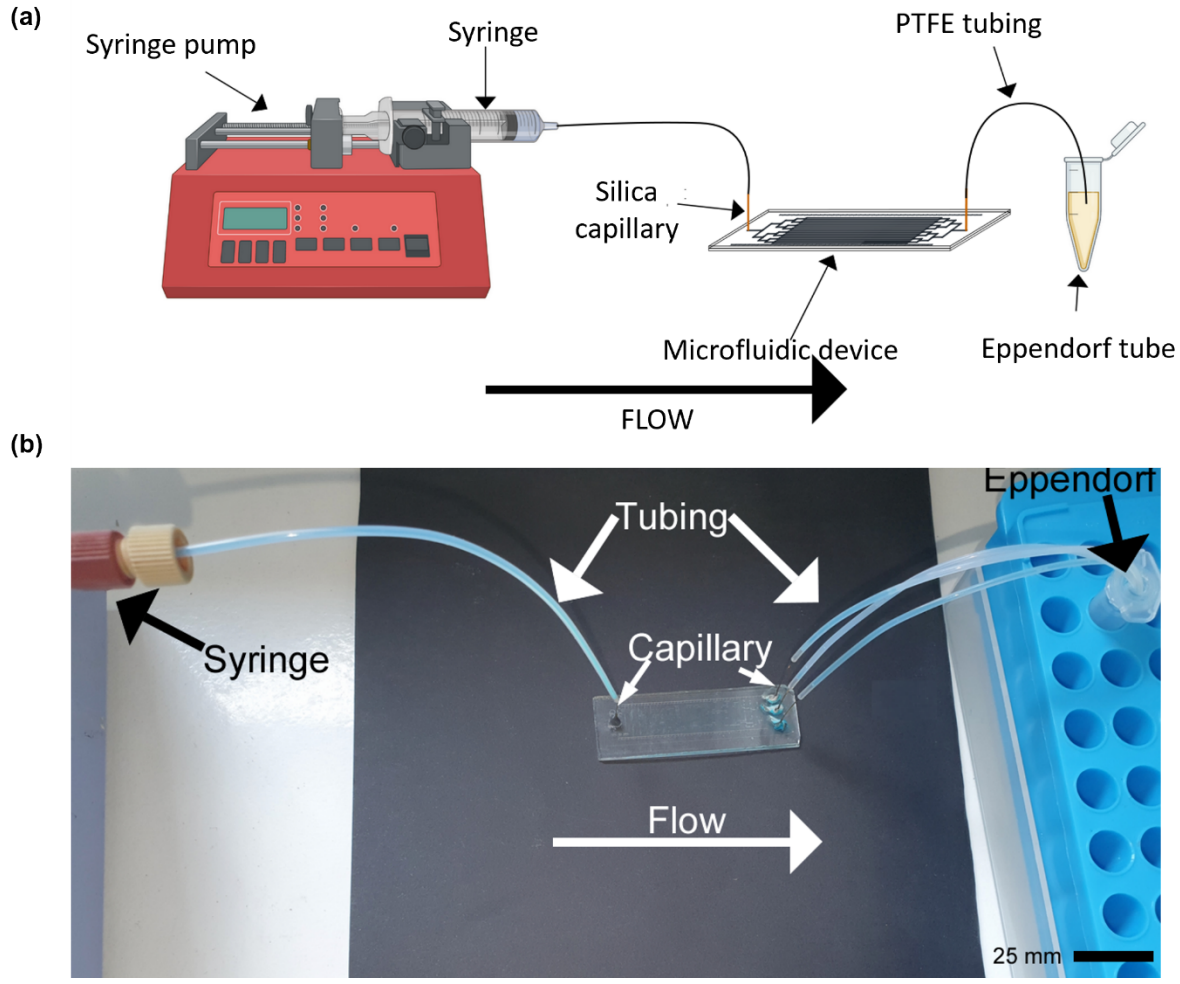


**Figure S2**: (a) Schematic drawing of the setup featuring the microfluidic chip interfaced to a syringe pump operated under positive pressure via PTFE tubing. A short piece of a silicon capillary was glued onto the microfluidic device. Effluent was collected in Eppendorf tubes. (b) Photograph of the setup.

# ESI 3 - Surface Immobilisation

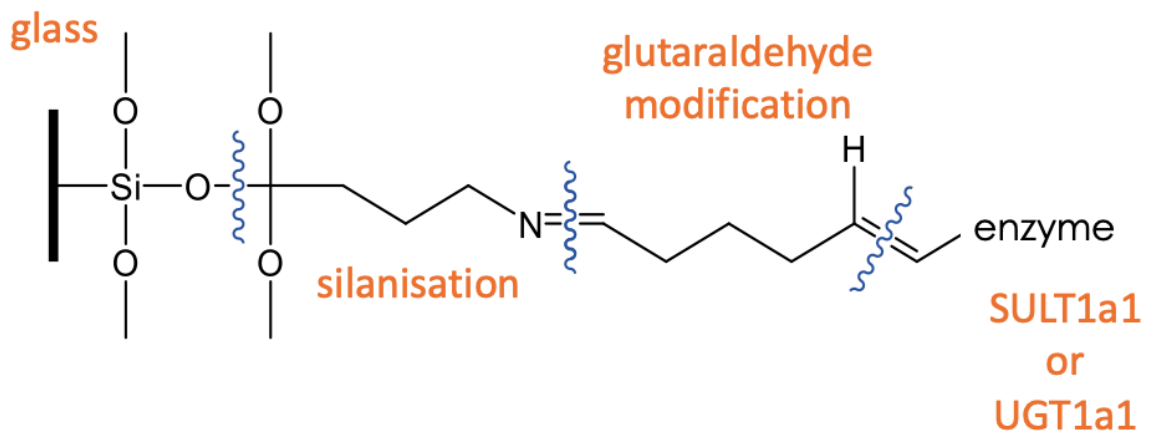


**Figure S3**: Surface immobilisation of enzymes on glass channels. Following flushing with sodium hydroxide and methanol, 3-(Aminopropyl) trimethoxy silane (5% v/v in ethanol) was introduced and left to incubate for 5 min. This was washed out with methanol and left to dry at 60 °C for an hour. Next glutaraldehyde (5% v/v in 0.1 M phosphate buffer, pH 7.4) was pumped for 1 h at 3 µL $min^{-1}$. Finally, the enzyme solutions, *i.e.* SULT1a1 (10 ng $mL^{-1}$) or UGT1a1 (0.15 mg $mL^{-1}$) were introduced and left to incubate in the fridge overnight.