

Supplementary Information

SmartBuild – A Truly Plug-n-Play Modular Microfluidic System

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In this supplementary information, schematic diagrams and dimensions of the components used in this study are provided.

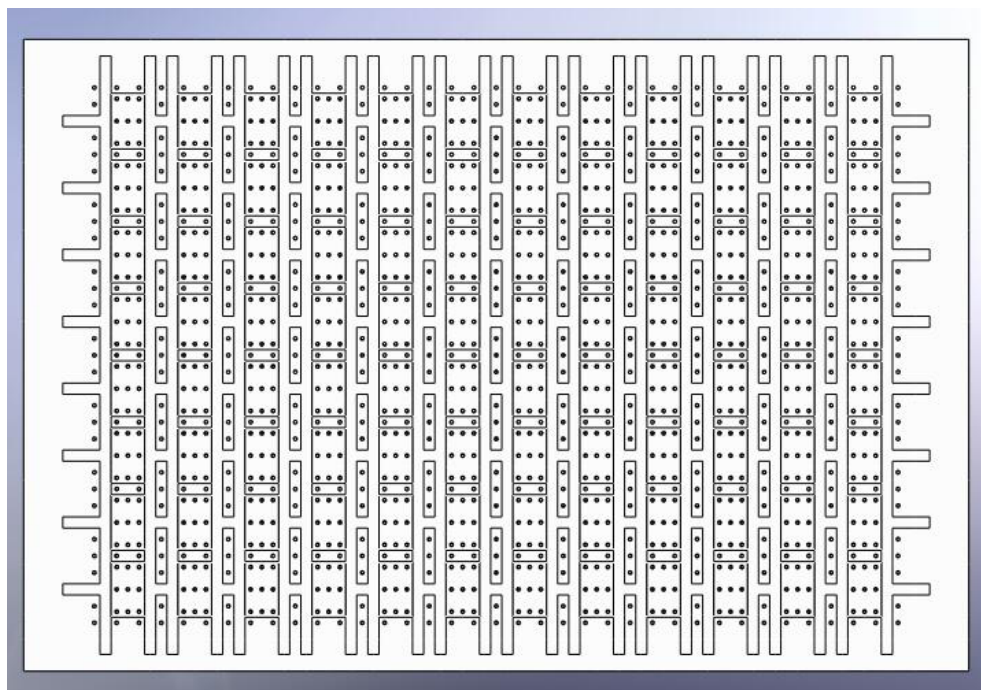


Figure S1a. Top view of the motherboard. The dimensions of the motherboard are 127mm (width) $\times$ 85mm (length) $\times$ 6mm (height).

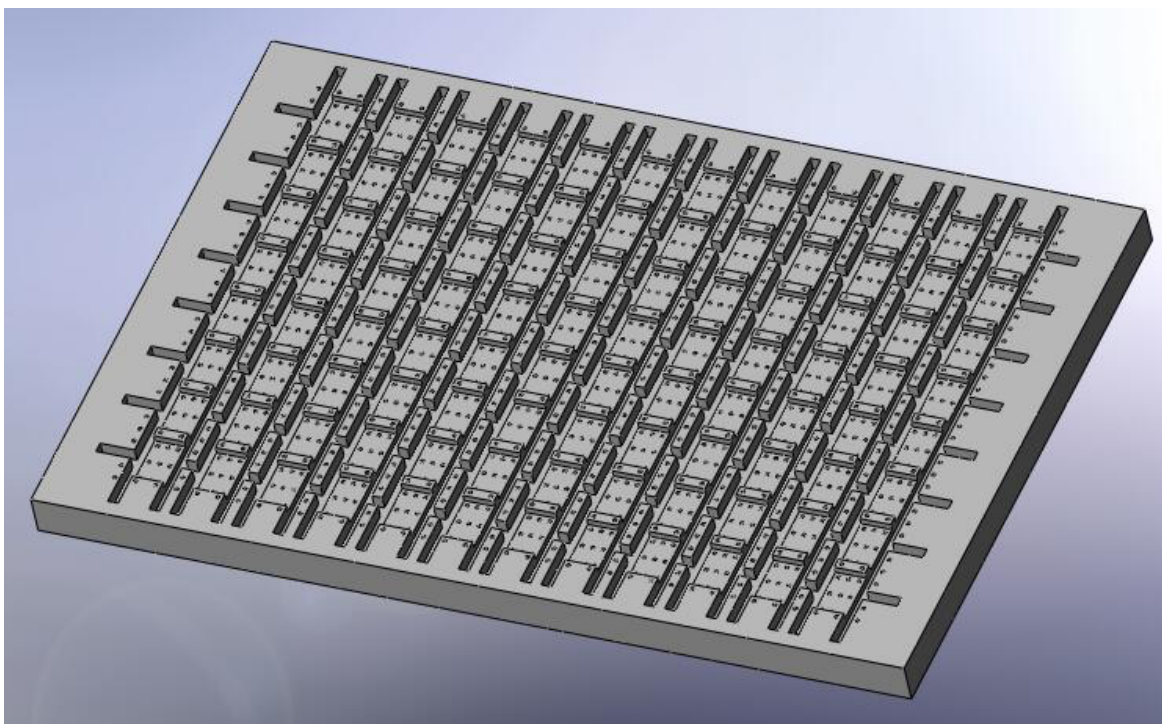


Figure S1b. 3D view of the motherboard.

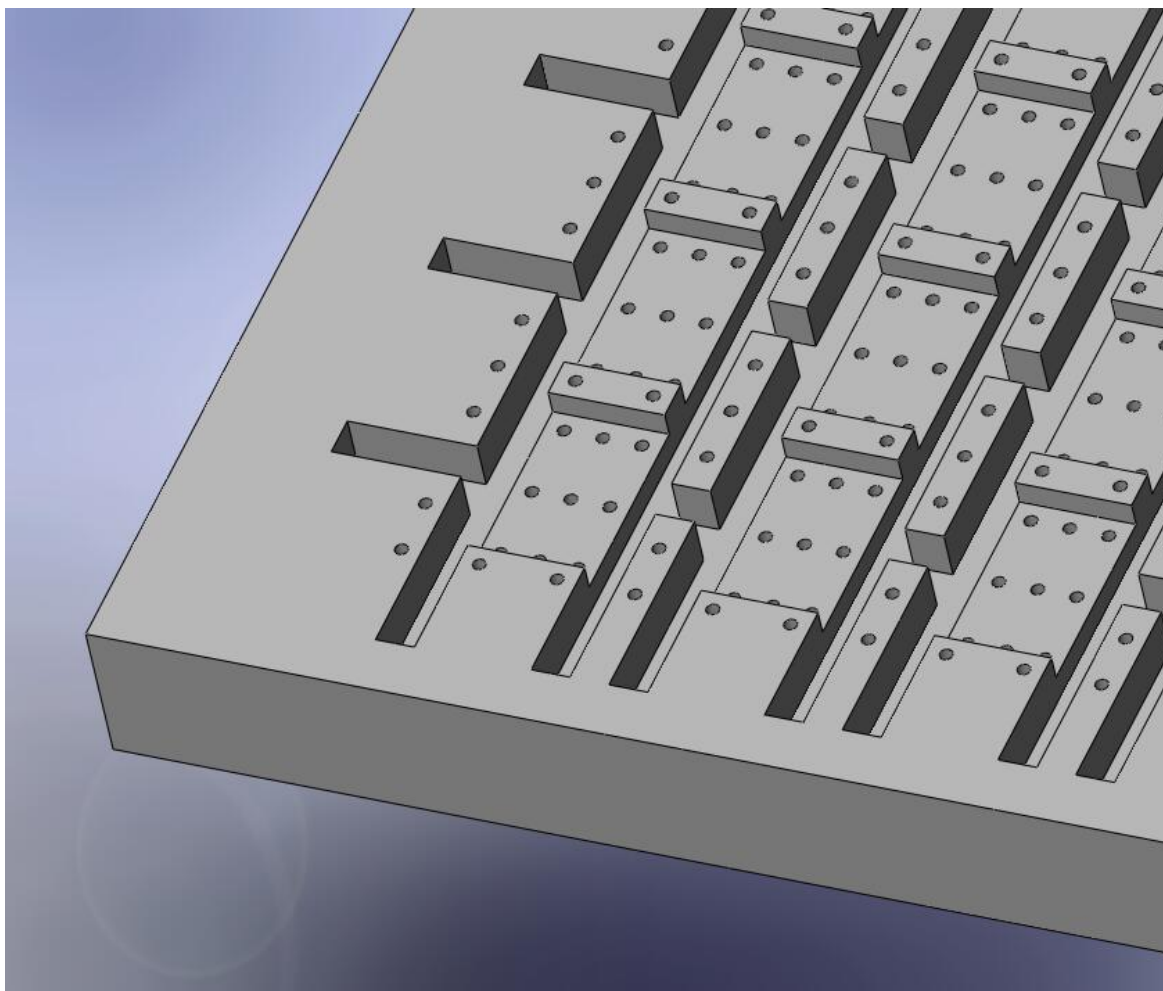


Figure S1c. Zoom in 3D view of the motherboard. Each groove is 2mm deep and 1.5mm wide. The dimensions of the rectangular depression are 4.5mm (width) $\times$ 7.5mm (length) $\times$ 1mm (depth) and 9mm apart center to center. The through holes are 1mm in diameter and have on function in this study.

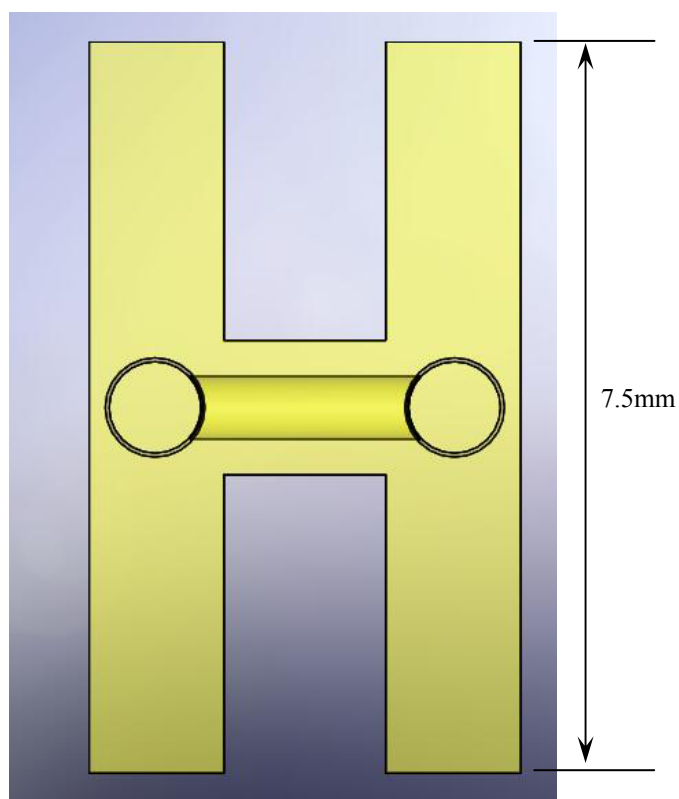


Figure S2a. Top view of the H-shaped microchannel insert.

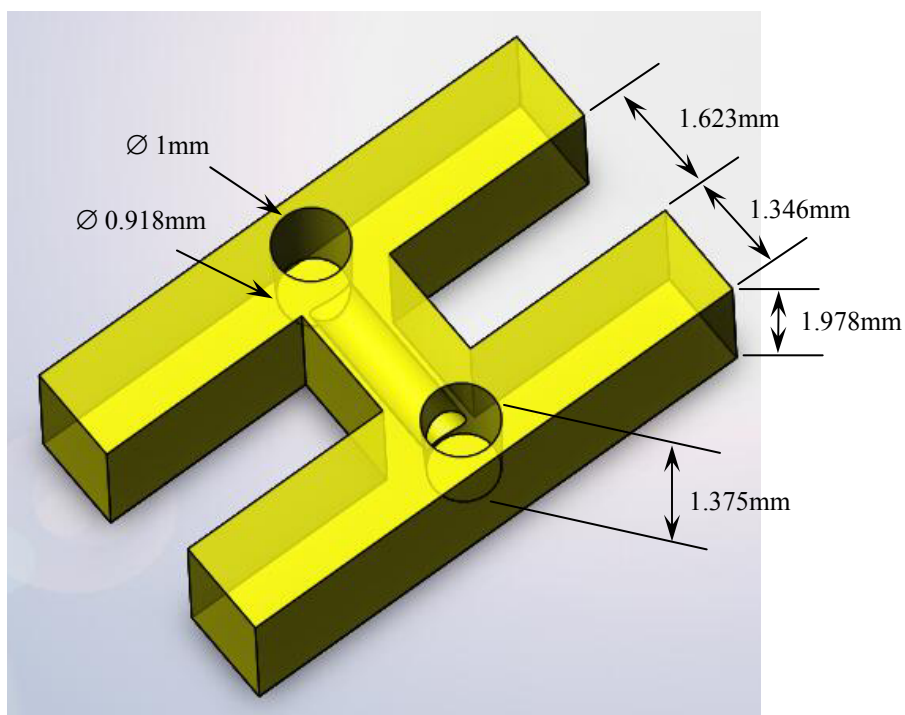


Figure S2b. 3D view of the H-shaped microchannel insert. The center microchannel is 0.635mm in diameter.

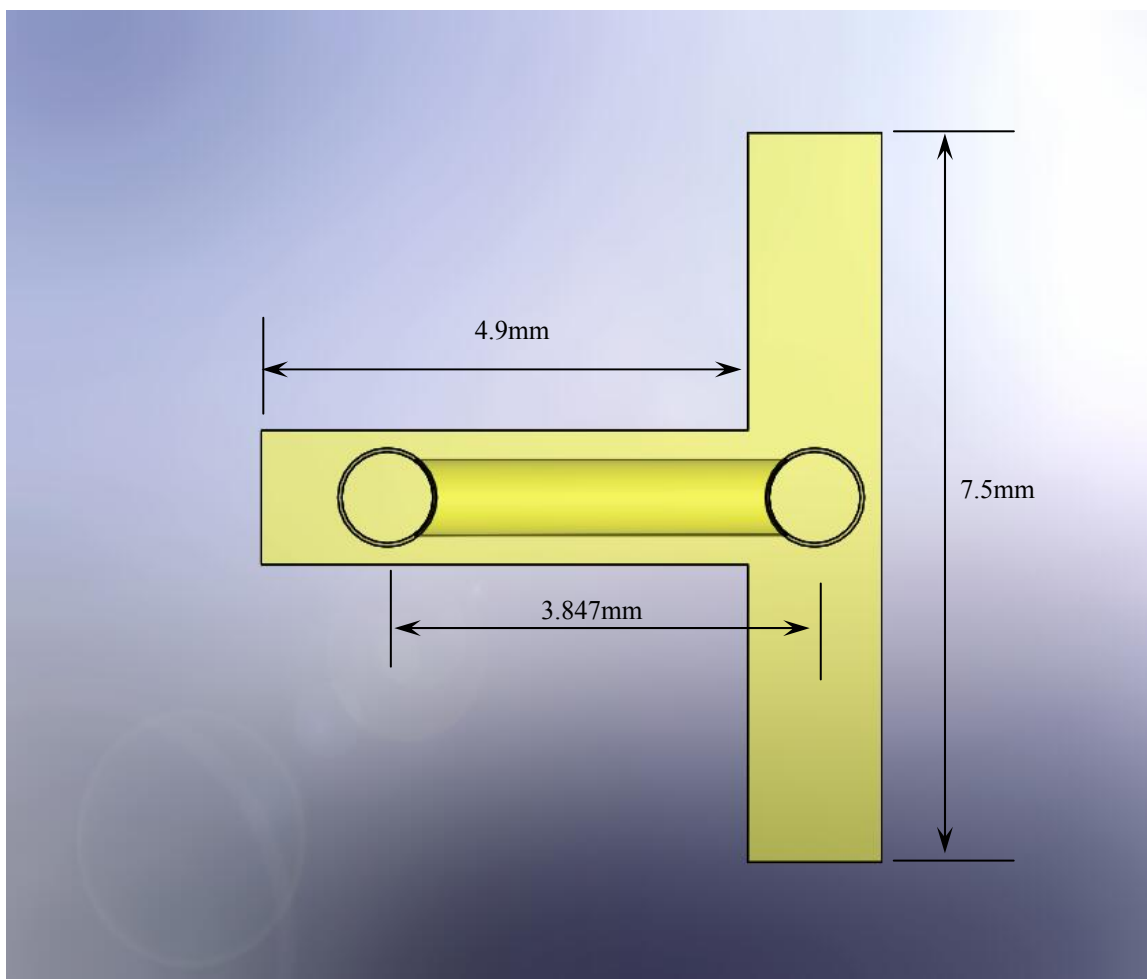


Figure S3a. Top view of the T-shaped microchannel insert.

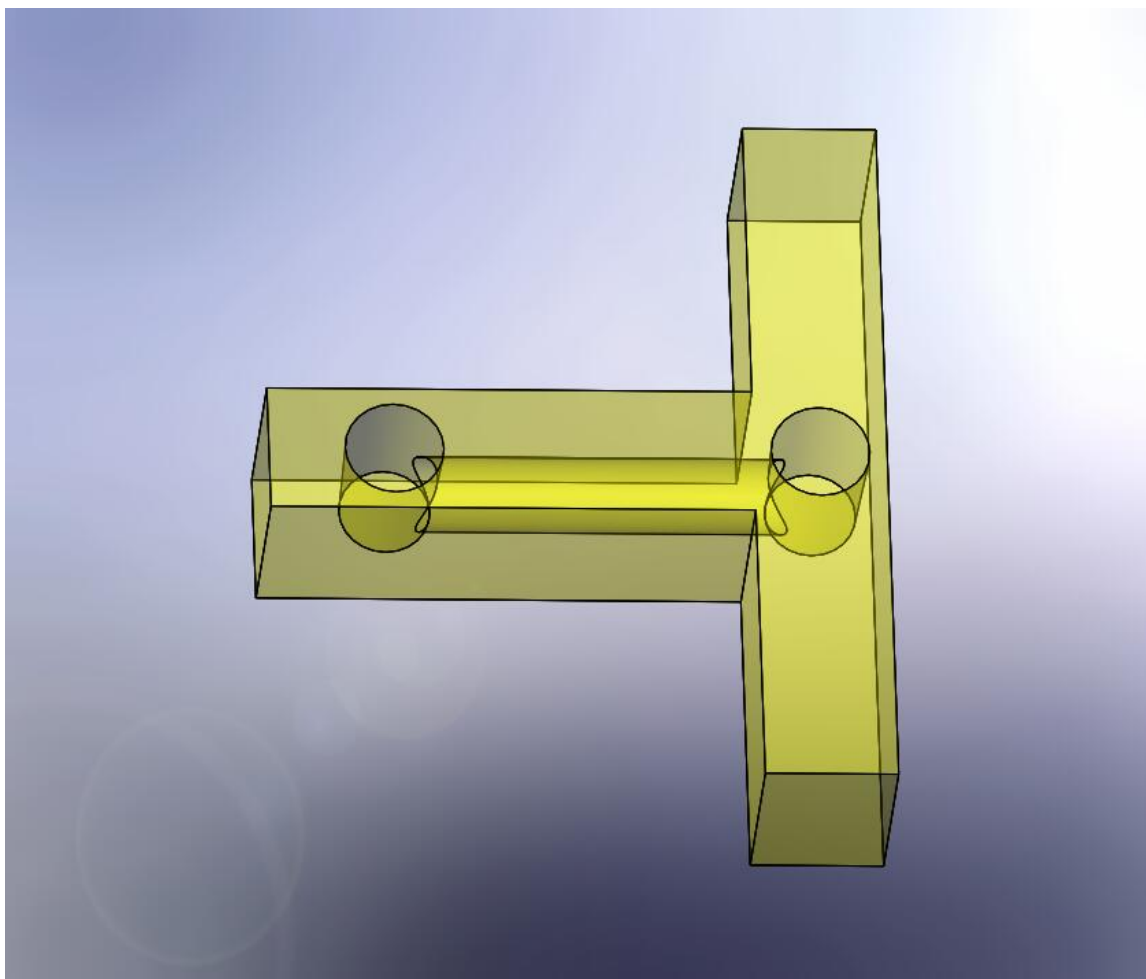


Figure S2b. 3D view of the T-shaped microchannel insert. The dimensions of the miniaturized female luer fitting, center microchannel, the width and depth of each beam are the same as the H-shaped microchannel insert.

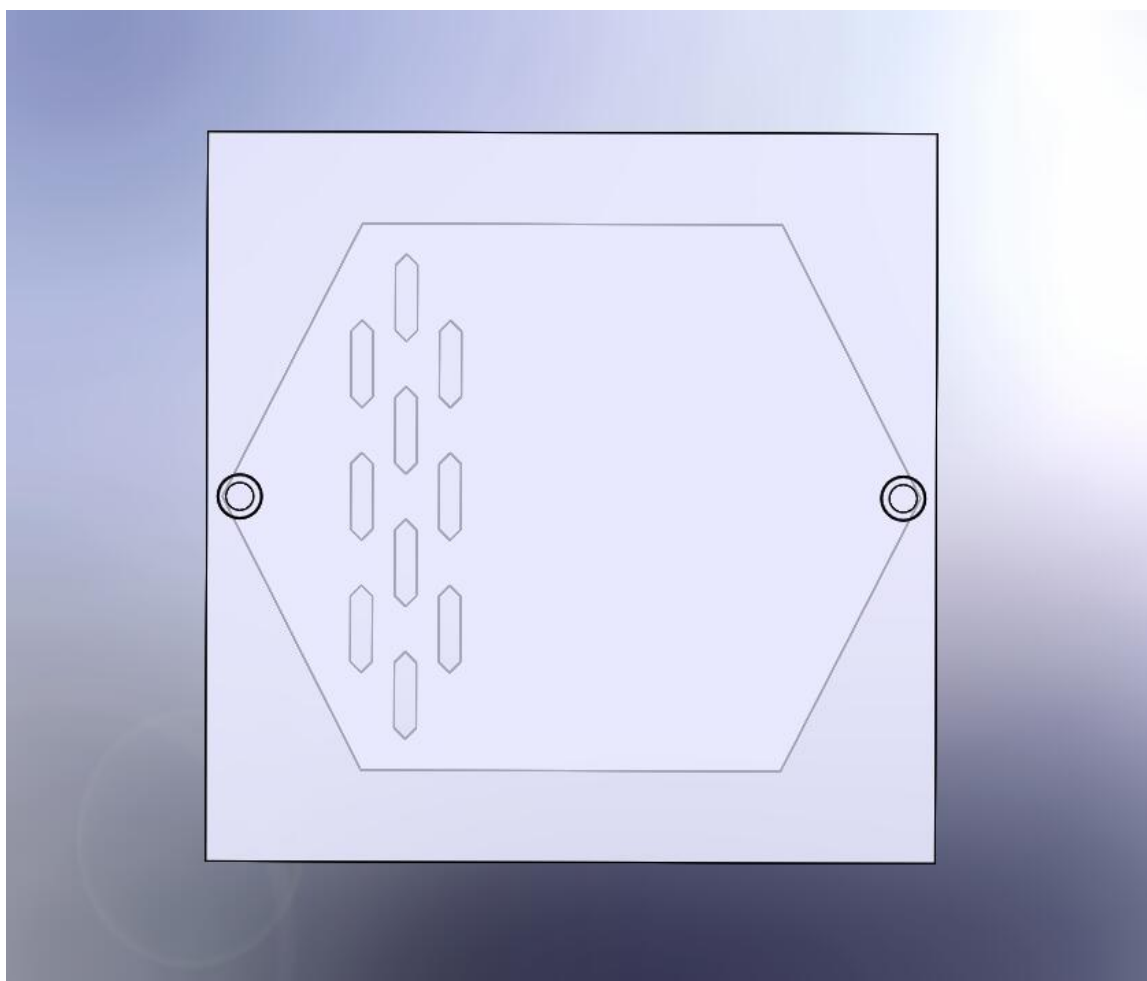


Figure S3a. Bottom view of the reaction chamber with flow deflector microchip.¹² The dimensions of the microchip are 16.5mm × 16.5mm × 2mm.

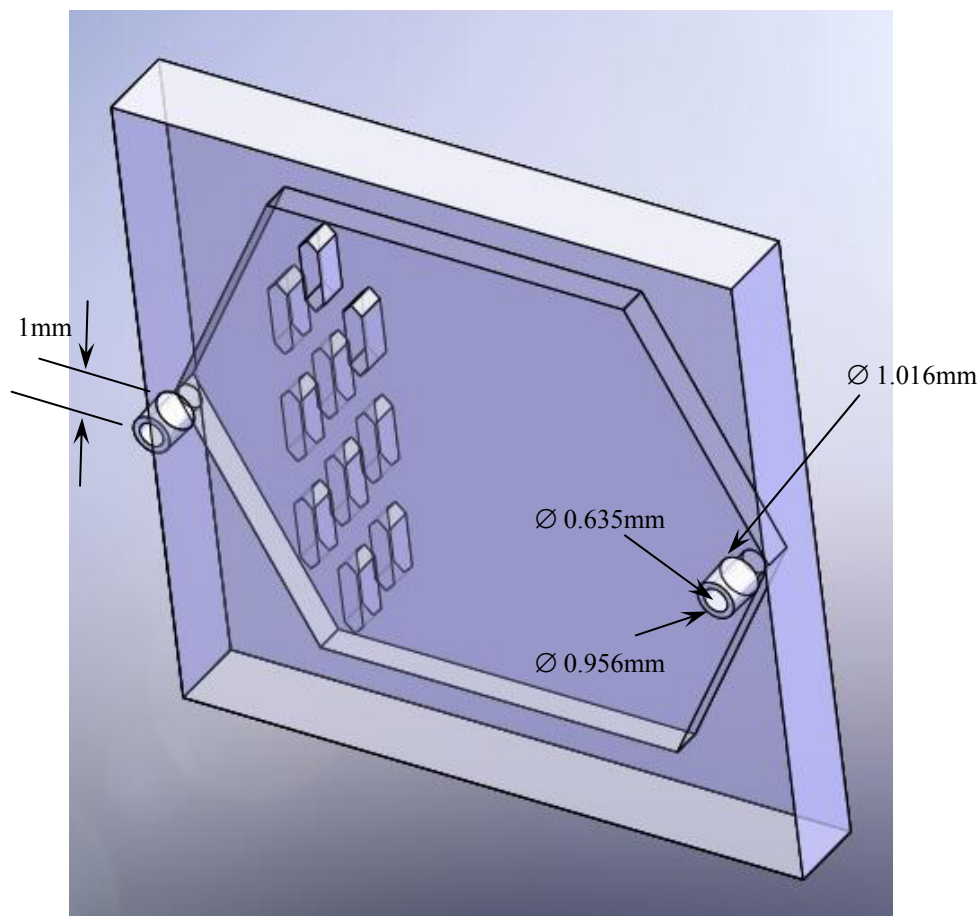


Figure S3b. 3D view of the reaction chamber with flow deflector microchip. The reaction chamber depth is 0.762mm. The dimensions of the miniaturized male luer fitting are depicted and are the same for every microchip used in this study.

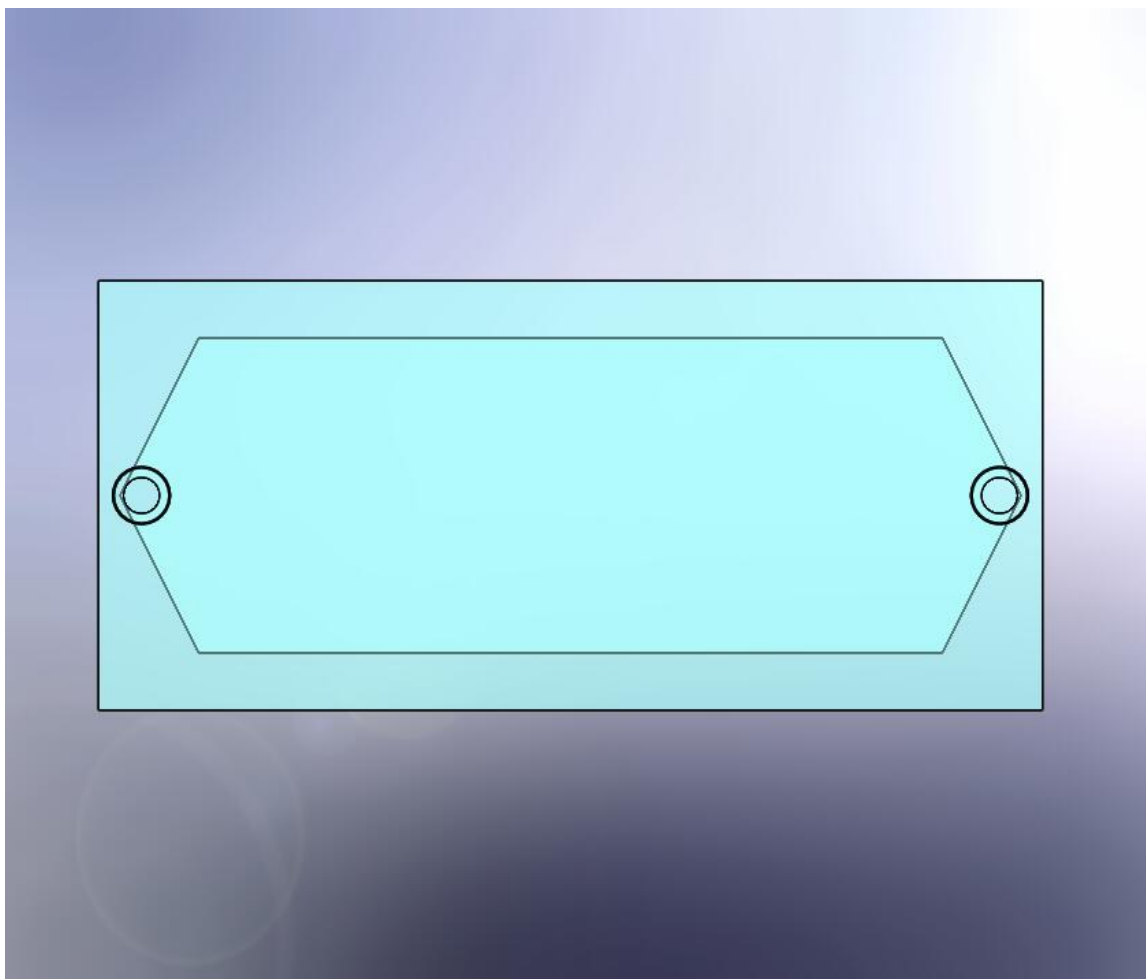


Figure S4. Bottom view of the long reaction chamber microchip. The dimensions of the microchip are $7.5\text{mm} \times 16.5\text{mm} \times 2\text{mm}$. The reaction chamber depth is 0.762mm . The dimensions of the miniaturized male luer fitting are the same as the one depicted in Figure S3b.

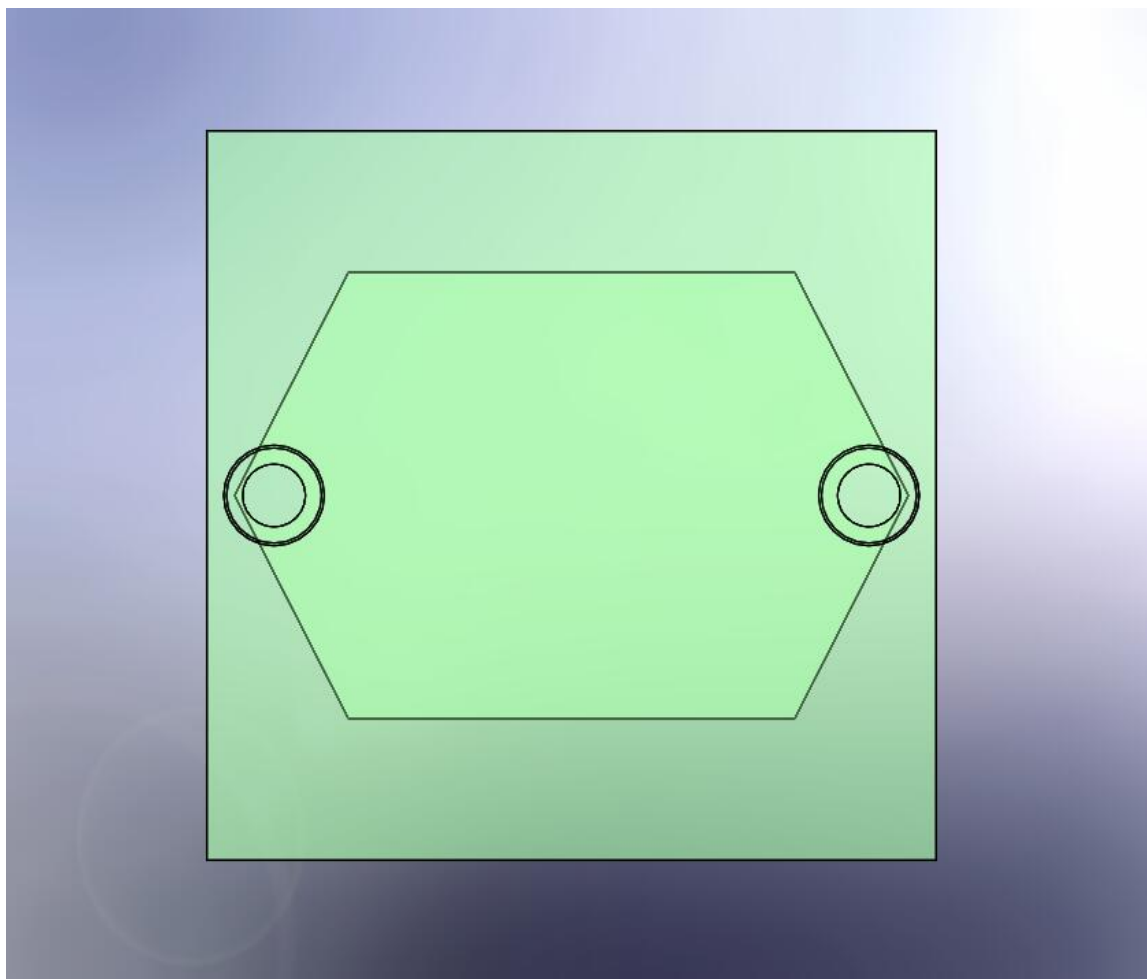


Figure S5. Bottom view of the small reaction chamber microchip. The dimensions of the microchip are $7.5\text{mm} \times 7.5\text{mm} \times 2\text{mm}$. The reaction chamber depth is 0.762mm . The dimensions of the miniaturized male luer fitting are the same as the one depicted in Figure S3b.

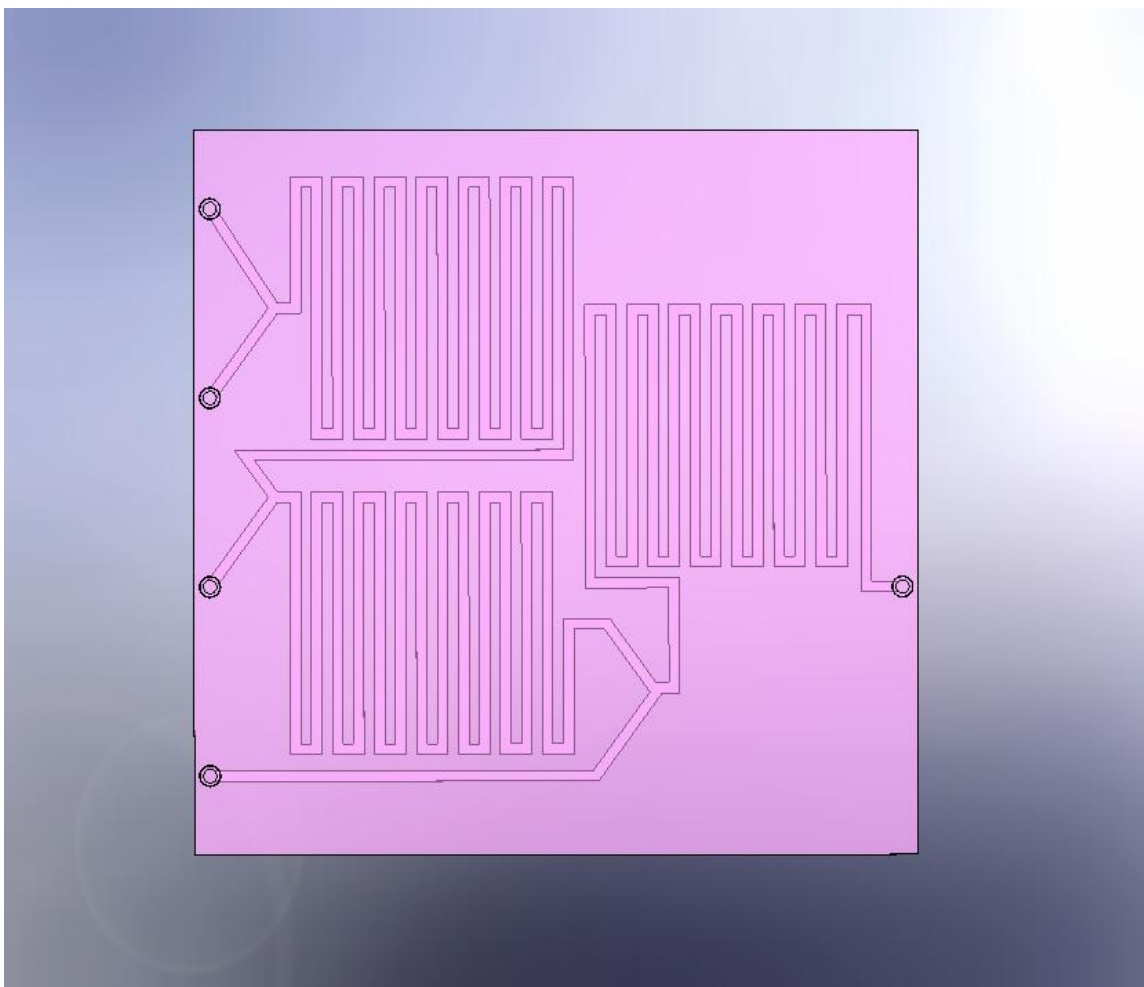


Figure S6. Bottom view of the large mixer microchip with four inlets and one outlet.
The dimensions of the microchip are $34.5\text{mm} \times 34.5\text{mm} \times 2\text{mm}$. The rectangular microchannels are $0.762\text{mm} \times 0.762\text{mm}$. The dimensions of the miniaturized male luer fitting are the same as the one depicted in Figure S3b.