

Supplementary Information

A pumpless cell culture chip with the constant medium perfusion-rate maintained by balanced droplet dispensing

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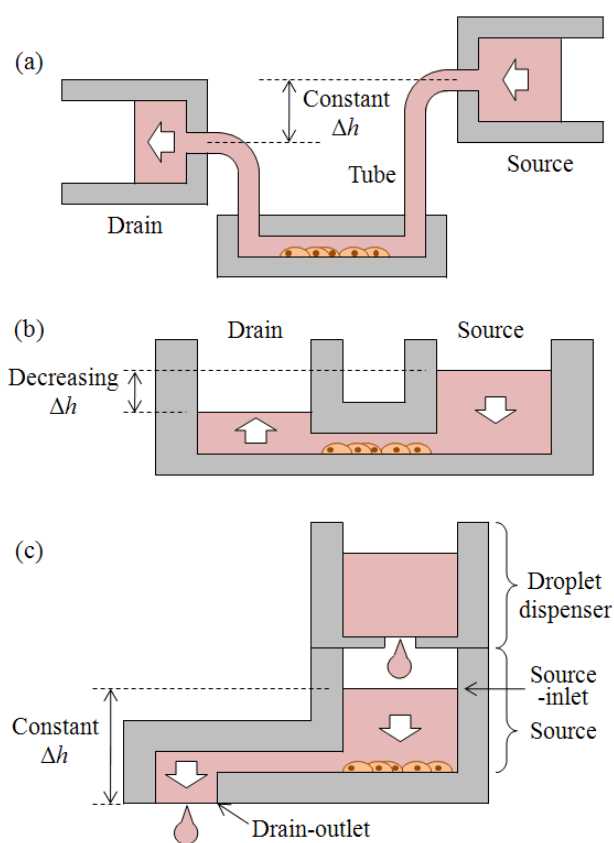


Fig. S1 Comparison of the pumpless perfusion methods: (a) the previous method with horizontally-oriented reservoirs, resulting in low-integrability and high dead-volume due to the external reservoirs interconnected by tubes; (b) the previous method with vertical reservoirs, resulting in the decreasing perfusion flow-rate due to the gradually decreasing Δh ; (c) the present method with droplet dispensers integrated on the vertical reservoirs, performing the constant flow-rate perfusion due to the constant Δh maintained by the balanced droplet dispensing between source-inlet and drain-outlet.

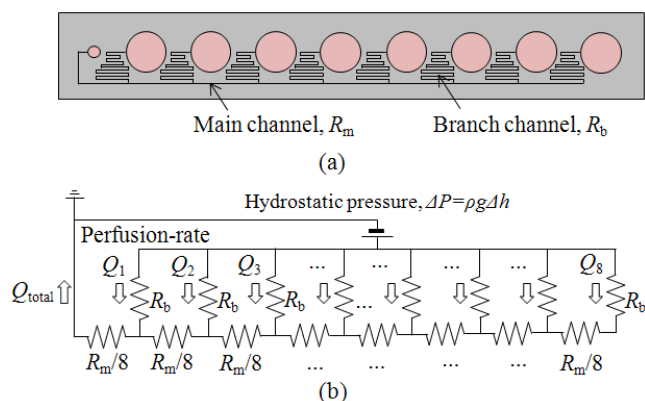


Fig. S2 Theoretical estimation of the flow-rates in the drain channel: (a) the enlarged view of the drain channel; (b) the equivalent electrical circuit model of the drain channels in (a).

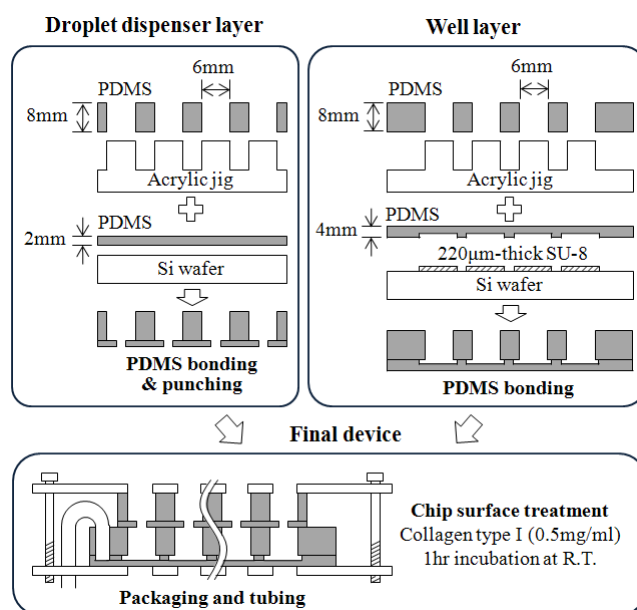


Fig. S3 Fabrication process for the pumpless perfusion cell culture chip.