

Electronic Supplementary Information (ESI)

## **Microfluidic channel-integrated hanging drop array chip for spheroid culture and analysis operated by pushbuttons**

Juhwan Park<sup>a</sup>, Hwisoo Kim<sup>a</sup>, and Je-Kyun Park<sup>\*,a,b</sup>

<sup>a</sup> Department of Bio and Brain Engineering, Korea Advanced Institute of Science and Technology (KAIST), 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea.

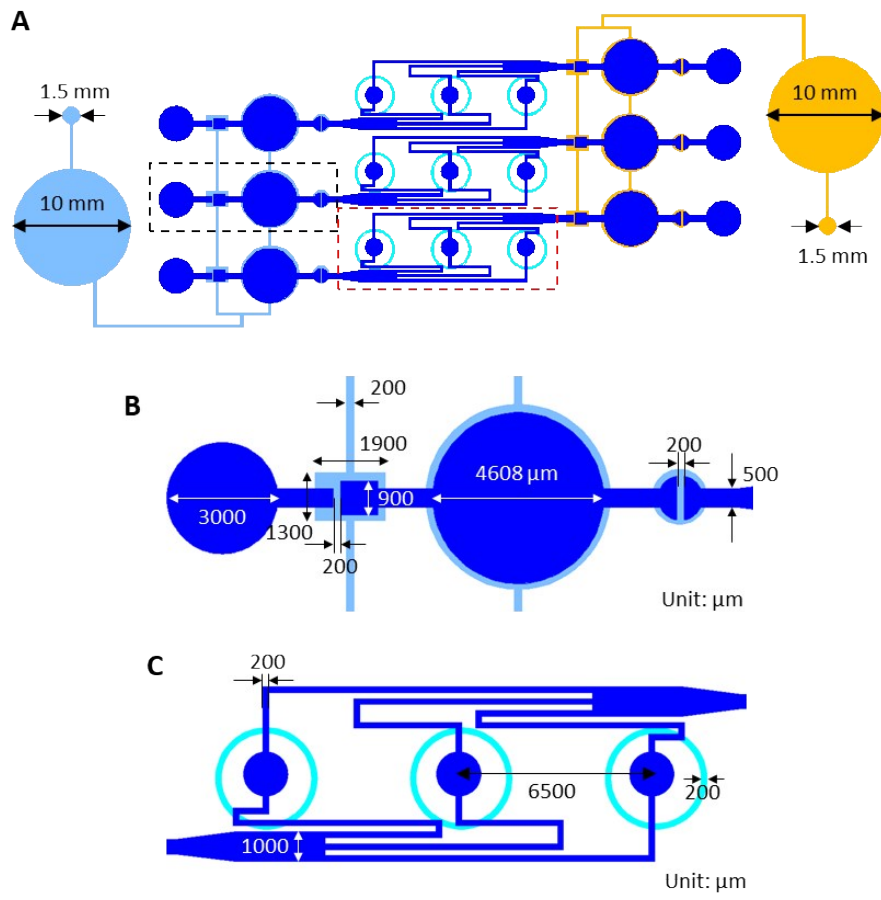
<sup>b</sup> KAIST Institute for Health Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea.

**Table S1.** Operation procedures to load cell suspensions in HDA chip.

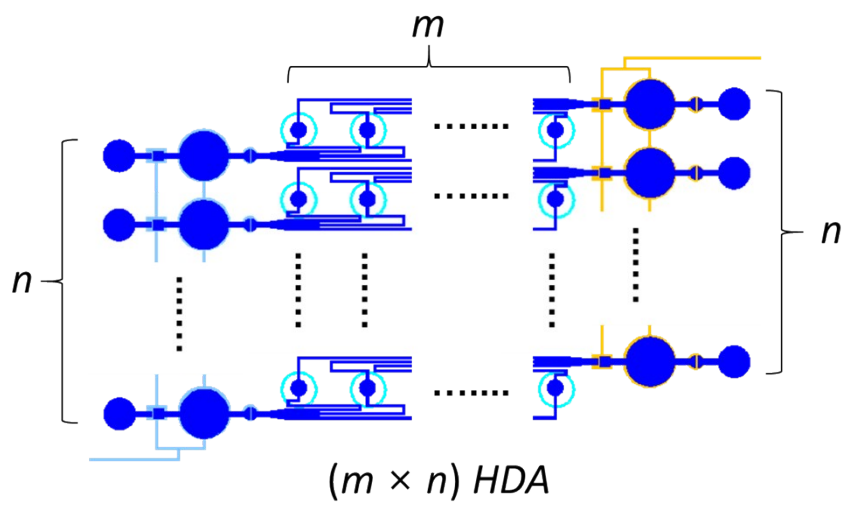
<b>Step</b>	<b>Operation</b>
1	Removal of a pre-loaded medium at inlets, outlets, and HDA using an aspirator
2	Loading the desired concentration of cell suspension into inlets
3	One time push of Button 1
4	One time push of Button 2
5	Two times push of Button 1
6	Removal of remaining cell suspension in inlets
7	Loading the fresh medium into inlets
8	Three times push of Button 1
9	Two times push of Button 2
10	Two times push of Button 1
11	Two times push of Button 2
12	Filling of inlets and outlets with a fresh medium

**Table S2.** Operation procedures for medium exchange.

<b>Step</b>	<b>Operation</b>
1	Removal of an old medium at inlets and outlets
2	Loading the fresh medium at inlets
3	One time push of Button 1
4	Three times push of Button 2
5	Three times push of Button 1
6	One time push of Button 2
7	Filling of inlets and outlets with a fresh medium



**Fig. S1** Design parameters of the device. (A) Schematic of the device. (B) Enlarged schematic view of (B) the black dotted box and (C) the red dotted box in panel A.



**Fig. S2** Schematic showing the scalability of the proposed device into  $(m \times n)$  HDA.