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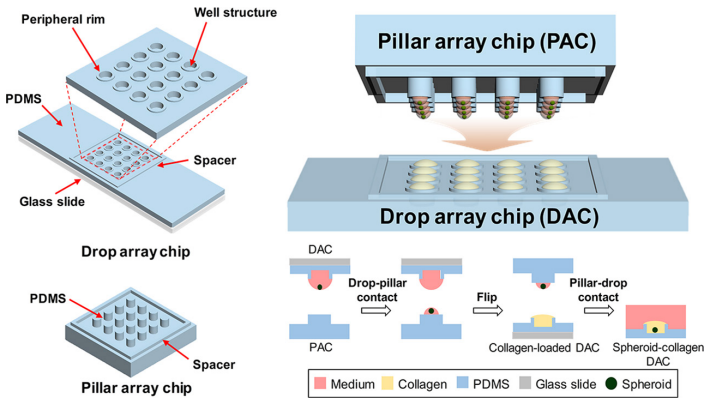
Chips with well and pillar structures allow for bypassing the bottlenecks of the hanging drop method when culturing and embedding spheroids.



Tumor cell migration is often studied through spheroid invasion assays to take advantage of 3-D culture models that better represent in vivo behavior compared to 2-D cultures. These assays typically use spherical cell clusters embedded in a hydrogel matrix. A common method for creating spheroids is called the hanging drop method, which uses gravity to form cell aggregates in drops that hang from a flat surface.

Hanging drop culture requires frequent changes between media, however, while having to avoid damaging the spheroid. Inserting spheroids into a hydrogel with this method also requires careful manual pipetting under magnifying equipment. Researchers report in *Biomicrofluidics* a high-throughput, droplet contact-based spheroid manipulation technique that avoids the time-consuming and labor-intensive requirements of the hanging drop methods. Their technique produces a similar invasion rate as that of the manual pipetting process and can be scaled up by increasing the number of arrays used.

The method utilizes two chips made of polydimethylsiloxane: a well structure with peripheral rims called the drop array chip, and a pillar structure called the pillar array chip. Each chip contains the wells or pillars arranged in an array. The authors demonstrate that this method allows them to use two drop array chips, with one inverted, to move spheroids from one drop to another. They also demonstrate that this method can transfer spheroids from an inverted drop chip array to a pillar array chip and then, after inverting the pillar array chip, into a hydrogel-loaded drop array chip.

Since each chip holds multiple wells or pillars, the number of spheroids that can be transferred simultaneously scales with the size of the chips used. The researchers expect this method to contribute to high-throughput spheroid assays, scaling up the reach of this important 3-D culturing.

Source: "High-throughput culture and embedment of spheroid array using droplet contact-based spheroid transfer," by Hwisoo Kim, Chang Hyun Cho, and Je-Kyun Park, *Biomicrofluidics* (2018). The article can be accessed at https://doi.org/10.1063/1.5039965.