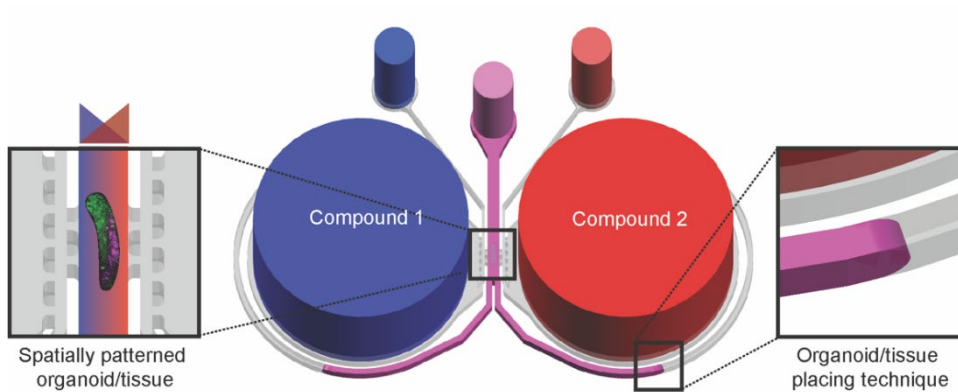


# High precision organoid positioning and patterning using hydraulic resistance at microscale



Microfluidic device for organoid patterning with high precision organoid positioning technique

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6.2214

## Keywords

organoid, microfluidics, gradient, patterning, hydrogel, placing, spatial cue

## Intellectual Property

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## Description

Organoid and Organoid-on-a-chip are becoming an invaluable tool for drug discovery and drug screening in the pharmaceuticals industry with the perspective to play a significant role in future personalised medicine applications. To date, precisely delivering compounds (e.g. drugs/morphogens/chemicals) to 3D *in vitro* tissues within microfluidic systems in a spatiotemporally controllable way remains one of the largest challenge of this emerging field.

Here, the present technology is a hybrid hydrogel-microfluidic device offering (1) a stable gradient of the compound(s) of interest to the positioned organoids of interest without cumbersome flow generating systems and (2) a precise and simple organoid positioning module. This approach finally enables a tight control over symmetry breaking events that orchestrate organoid patterning. In addition, the present work significantly reduces the gap to bring more accurate *in vitro* models to be routinely used in pre-clinical and in the clinical phases.

## Advantages

- Ability to spatially pattern an organoid
- Simple organoid/tissue placing technique
- No additional flow generating system needed
- Spatial characterization of the effect of multiple compounds on the organoid/tissue is doable
- Adaptable to various designs according to the type of organoid/tissue

## Applications

- Complex and physiologically relevant organoid generation
- Drug testing and screening
- *In vitro* disease modeling
- Personalized medicine