# Open Microfluidic Coculture Device

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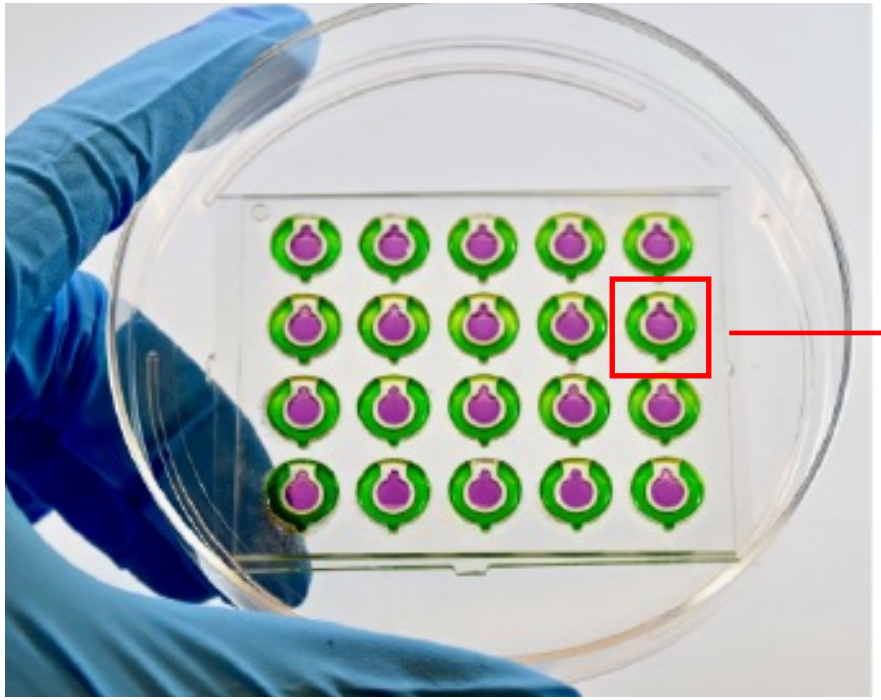
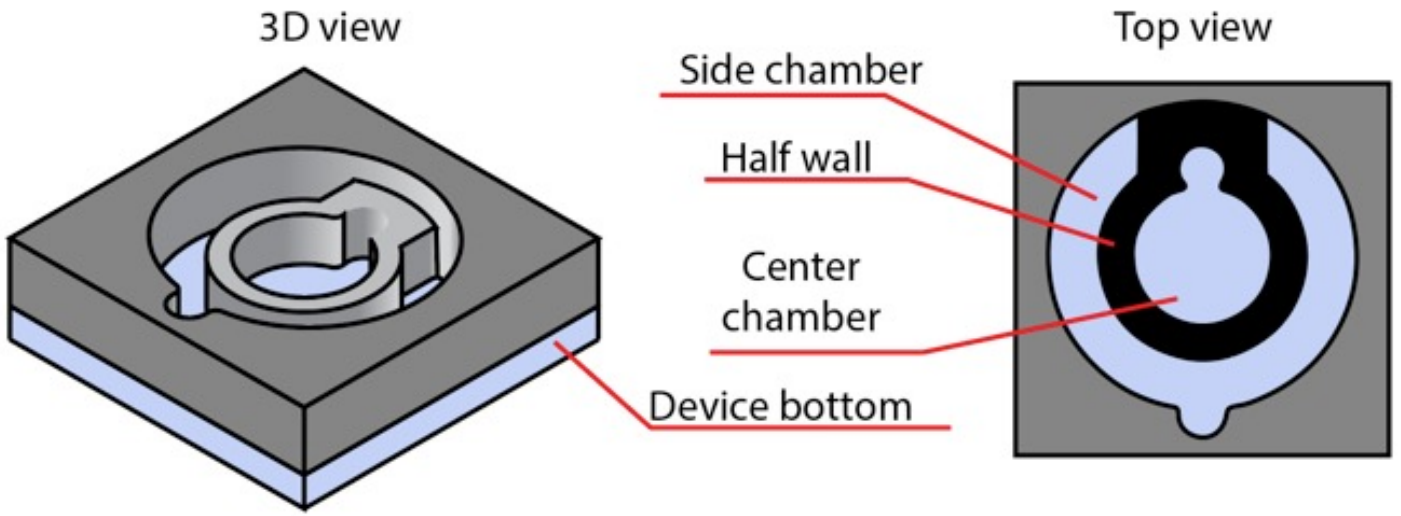
# A novel open microfluidic coculture device



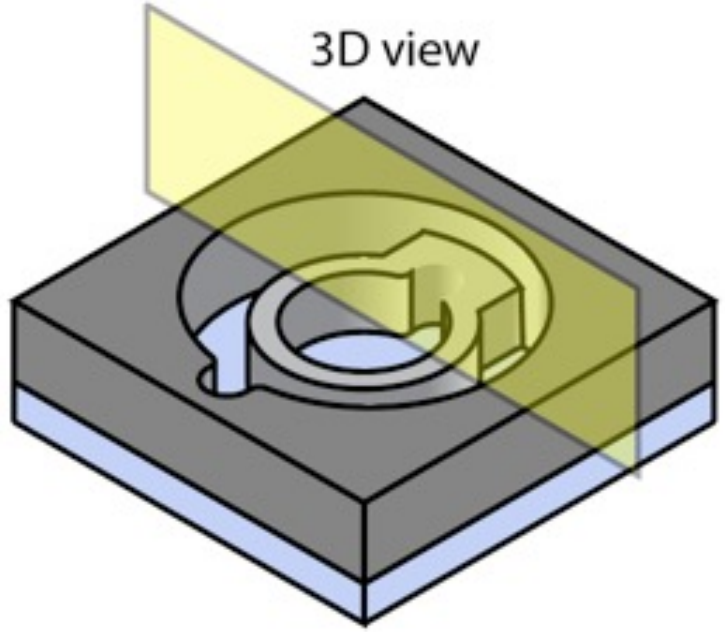
A plate of microfluidic wells in 5x4 array fitted inside a Petri dish



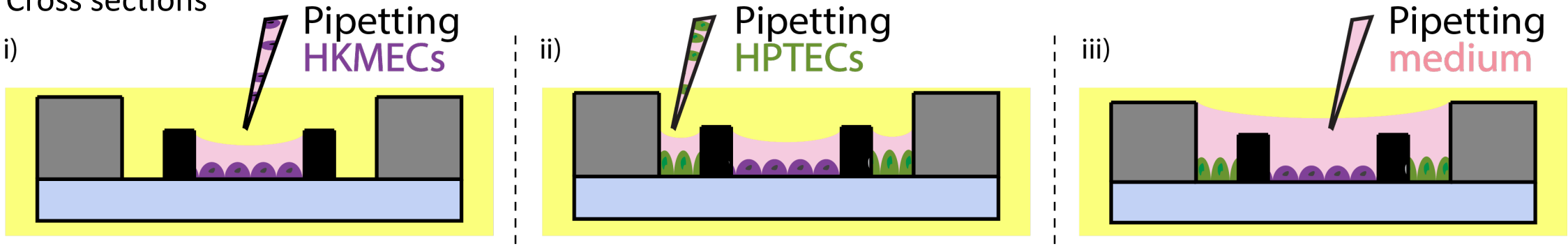

- Two cell populations are separated by the half wall
- Paracrine signaling occurs through shared media

# Coculture experiment workflow

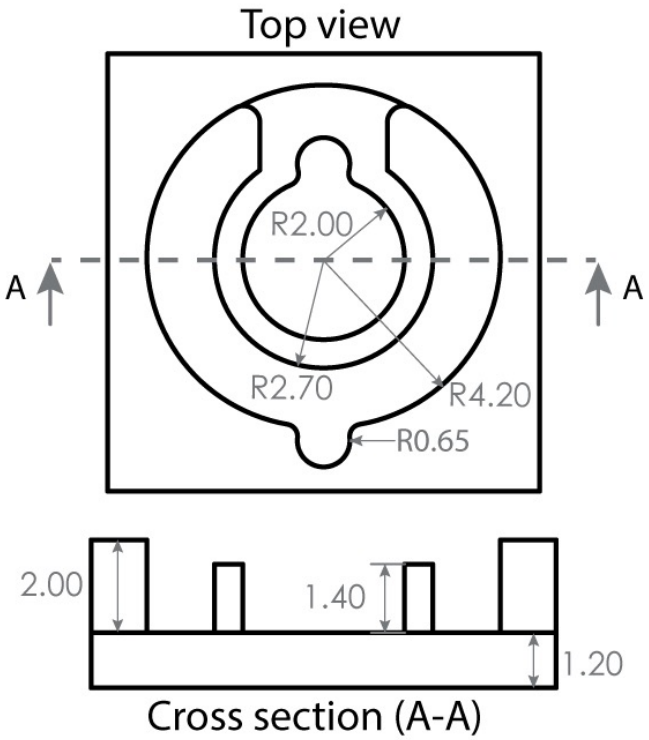
- Isolate kidney endos and epis from human fetal donor tissues
- Selectively plate kidney endos and epis into the coculture device (Day 0)
- Add cell culture media to connect the two chambers (Day 1)
- **Analyze kidney endos with immunocytochemistry and RT-qPCR (Day 4)**




Cross sections



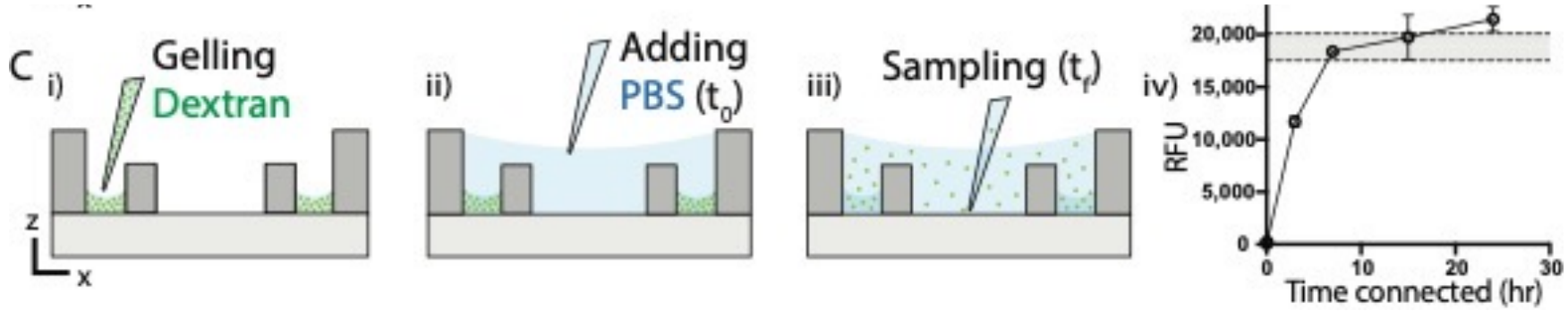
# Device parameters




Large device dimensions (1uL = 1 $mm^3$)

- Inner chamber seeding area: 13.69 $mm^2$ (radius: 2.0 mm)
- Inner chamber loading volume: 16 uL
- Outer chamber seeding area: 31.14 $mm^2$ (width: 1.6 mm)
- Outer chamber loading volume: 40 uL
- Ridge thickness: 0.7 mm
- Ridge height: 1.4 mm
- To connect both chambers: remove old media and re-add 100uL

# Diffusion




Dissolved solid dextran-fluorescein (40 kDa) in collagen I (3 mg/mL)