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## Function integration in 3D-Printed $\mu$ Fluidics using a "Print Pause Print" Strategy

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► **To cite this version:**

Matthieu Sagot, Elise Bou, Timothée Derkenne, C. Tregouet, Vincent Raimbault, et al.. Function integration in 3D-Printed  $\mu$ Fluidics using a "Print Pause Print" Strategy. MicroTAS, Oct 2023, Katowice, France. 2023. hal-04623218

**HAL Id: hal-04623218**

**<https://laas.hal.science/hal-04623218>**

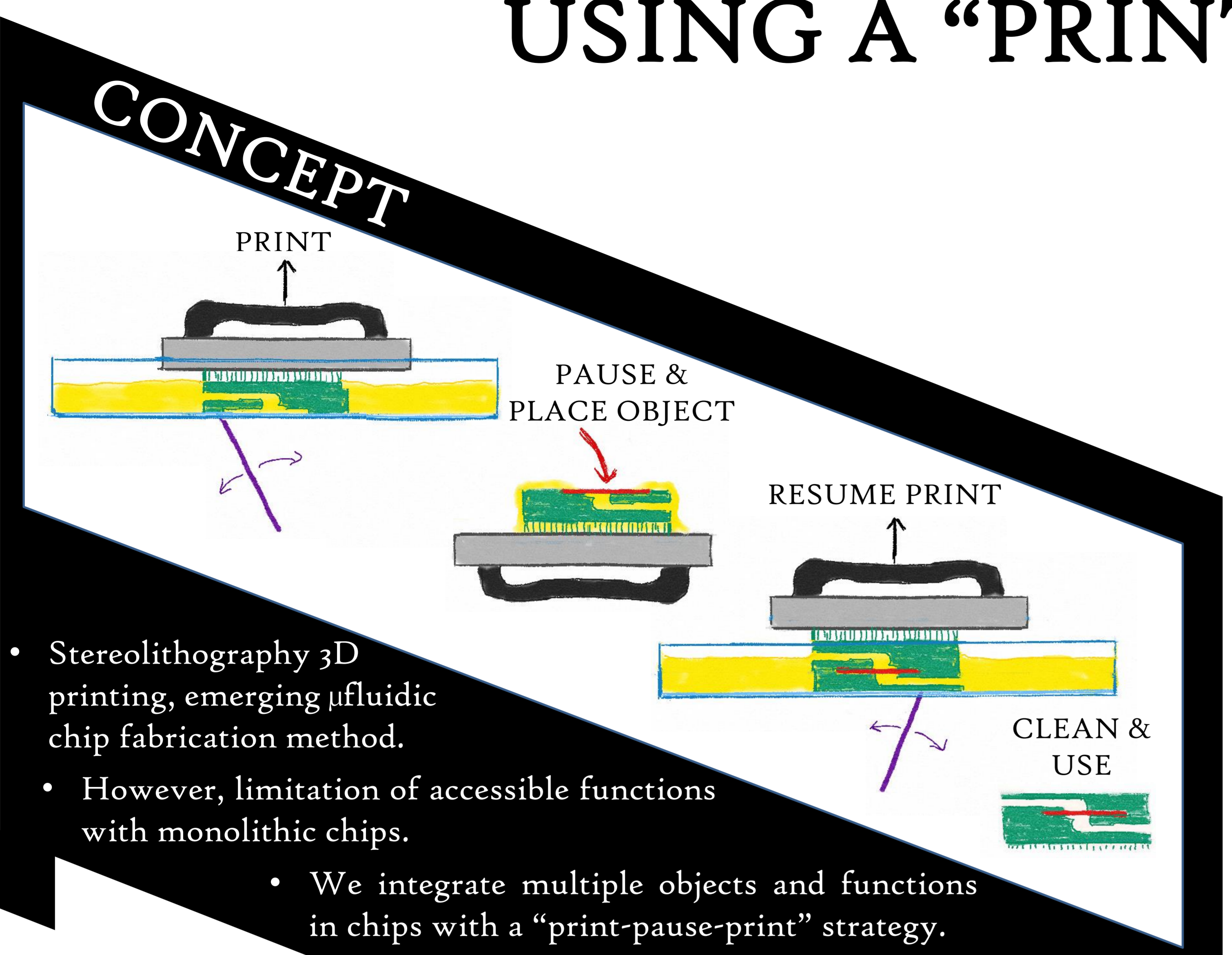
Submitted on 25 Jun 2024

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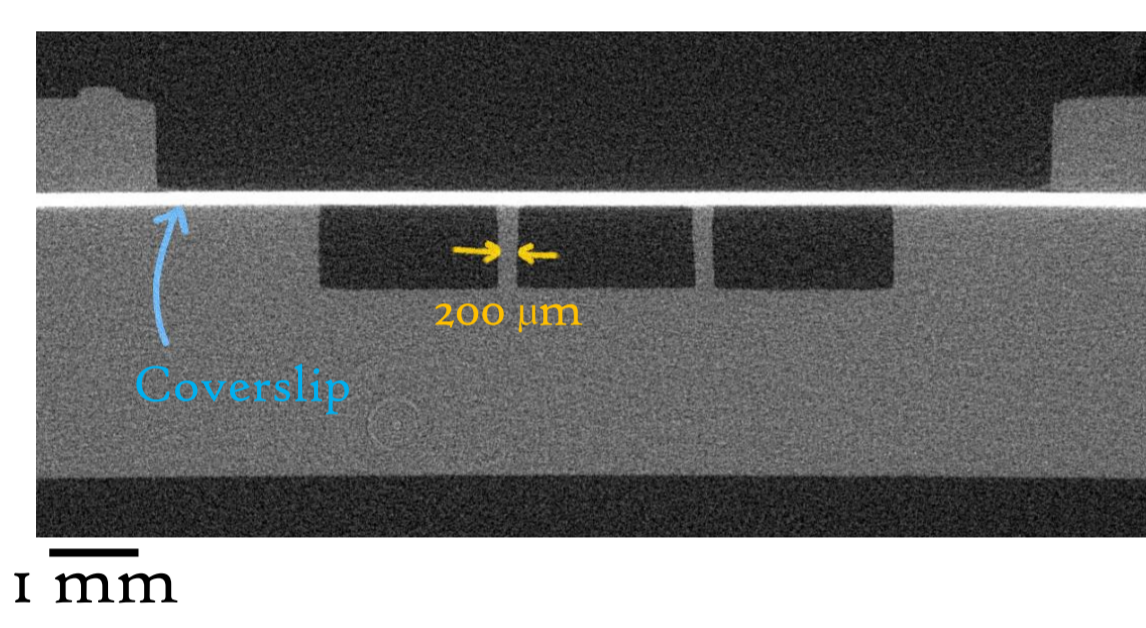
# FUNCTION INTEGRATION IN 3D-PRINTED $\mu$ FLUIDICS USING A "PRINT-PAUSE-PRINT" STRATEGY



- Stereolithography 3D printing, emerging  $\mu$ fluidic chip fabrication method.
- However, limitation of accessible functions with monolithic chips.
  - We integrate multiple objects and functions in chips with a "print-pause-print" strategy.
- Printer: DWS 29J+ and Forms 3 / Resin: DWS DS3000 and Formlabs Clear
- Images: X-ray tomography

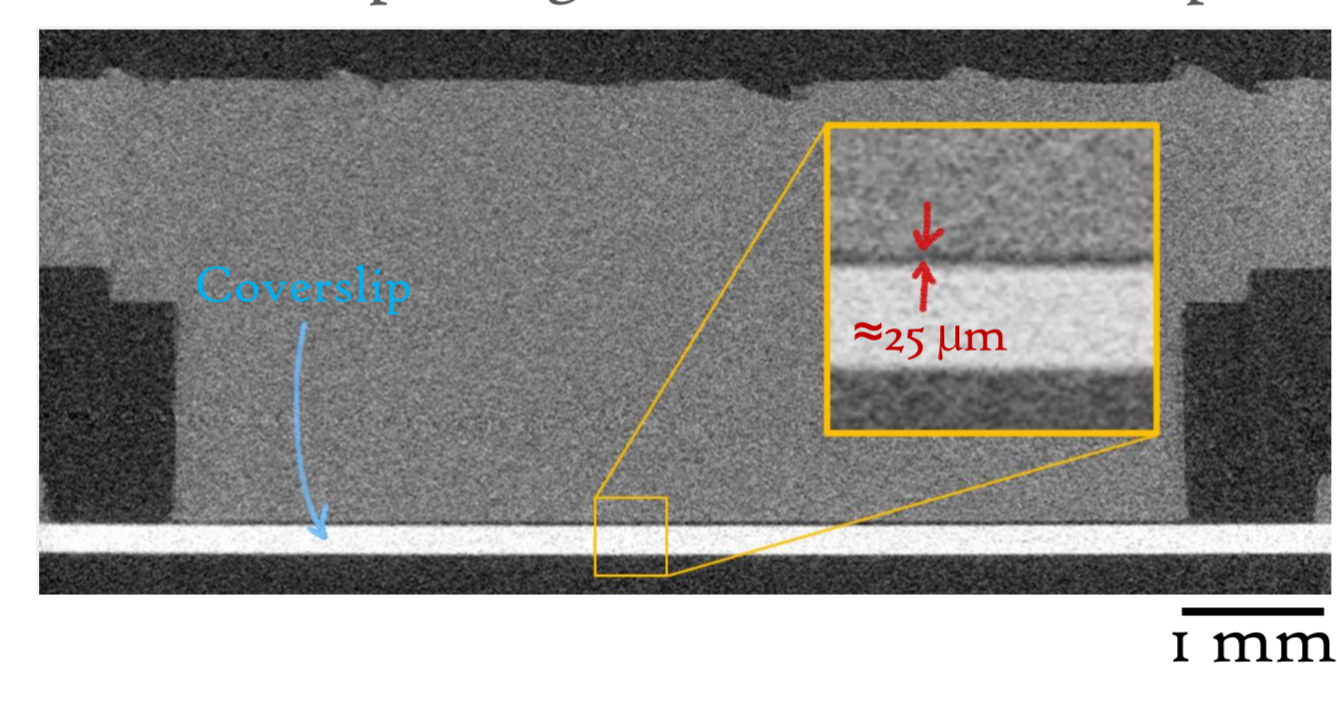
## GLASS SLIDE - IMAGING & THIN CHANNELS

Silanized coverslip integrated before channel printing.

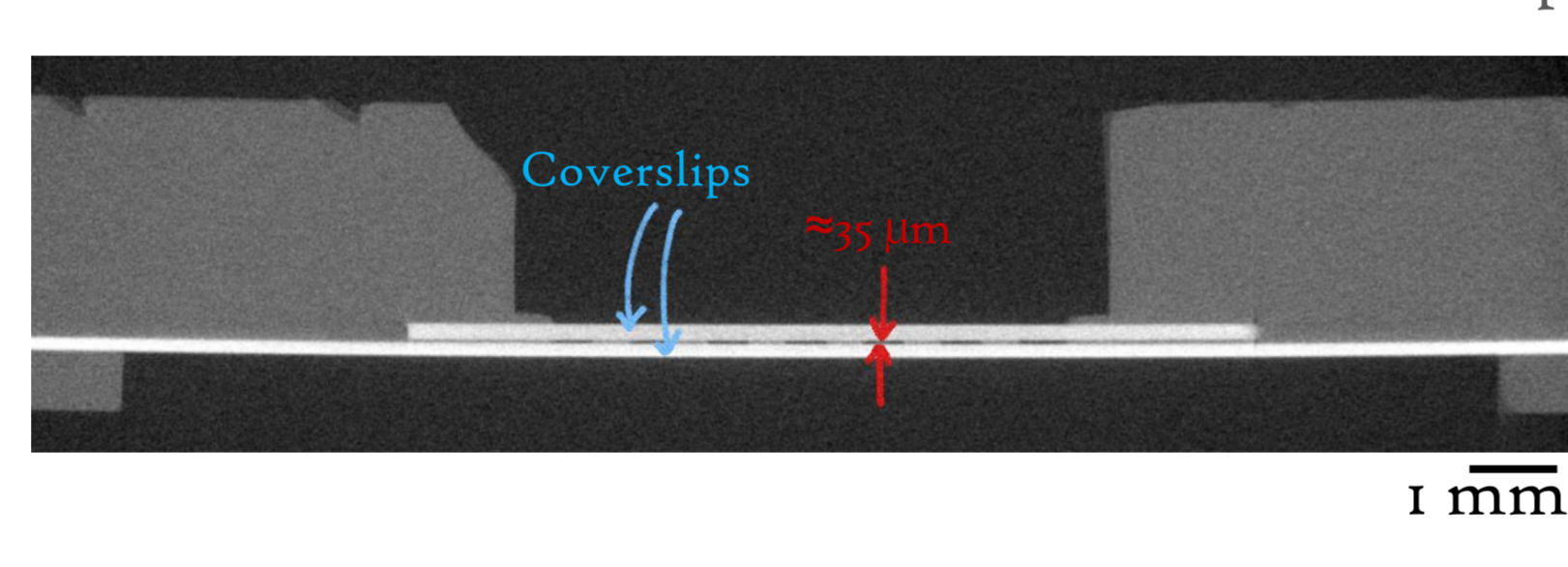


Max pressure	Chip 1	Chip 2	Chip 3
1 mm wall	2 bars	3,6 bars	2,5 bars
500 $\mu$ m wall	>4 bars	>4 bars	>3,5 bars
200 $\mu$ m wall	>3,5 bars	>3,5 bars	3,2 bars

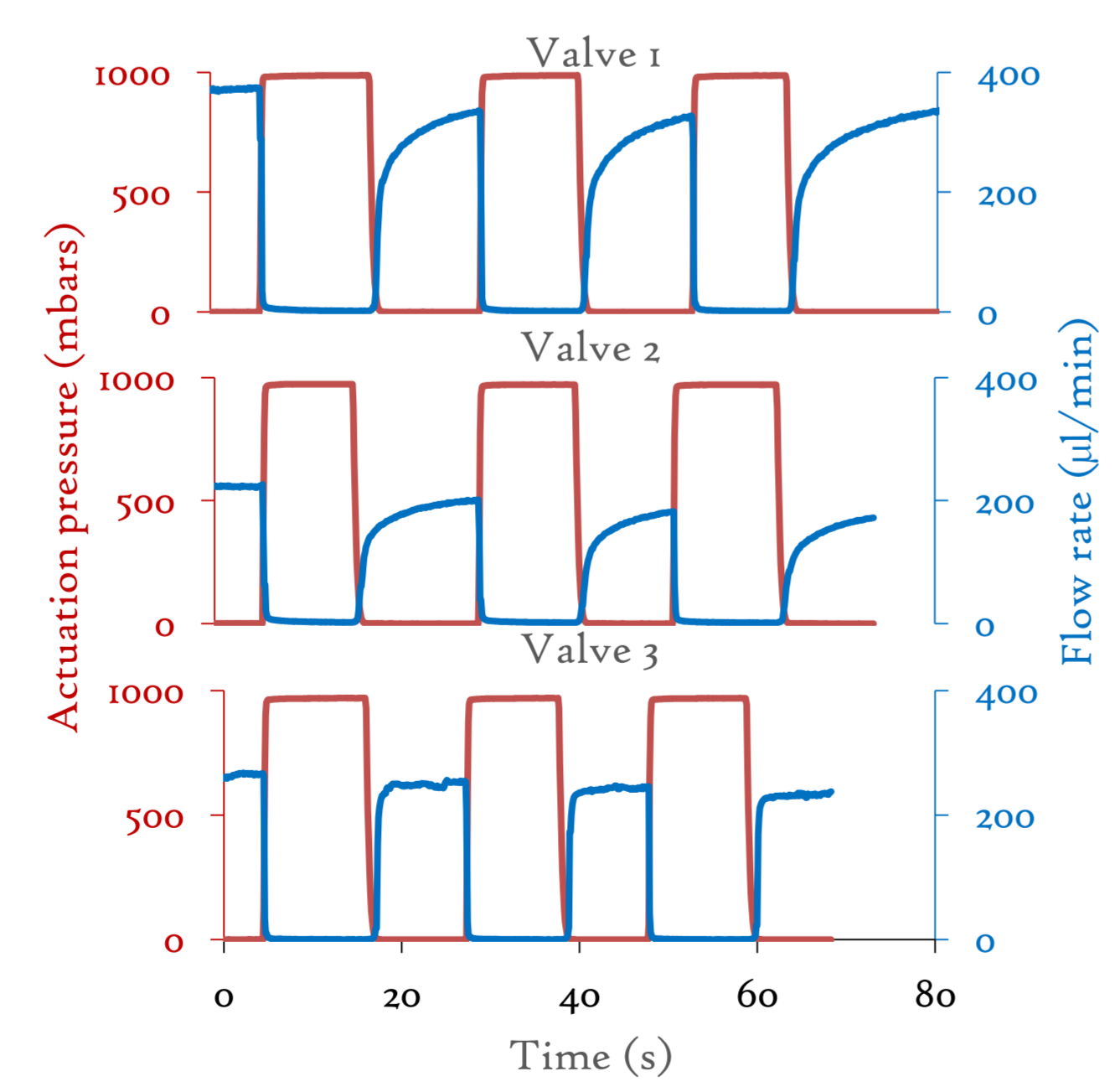
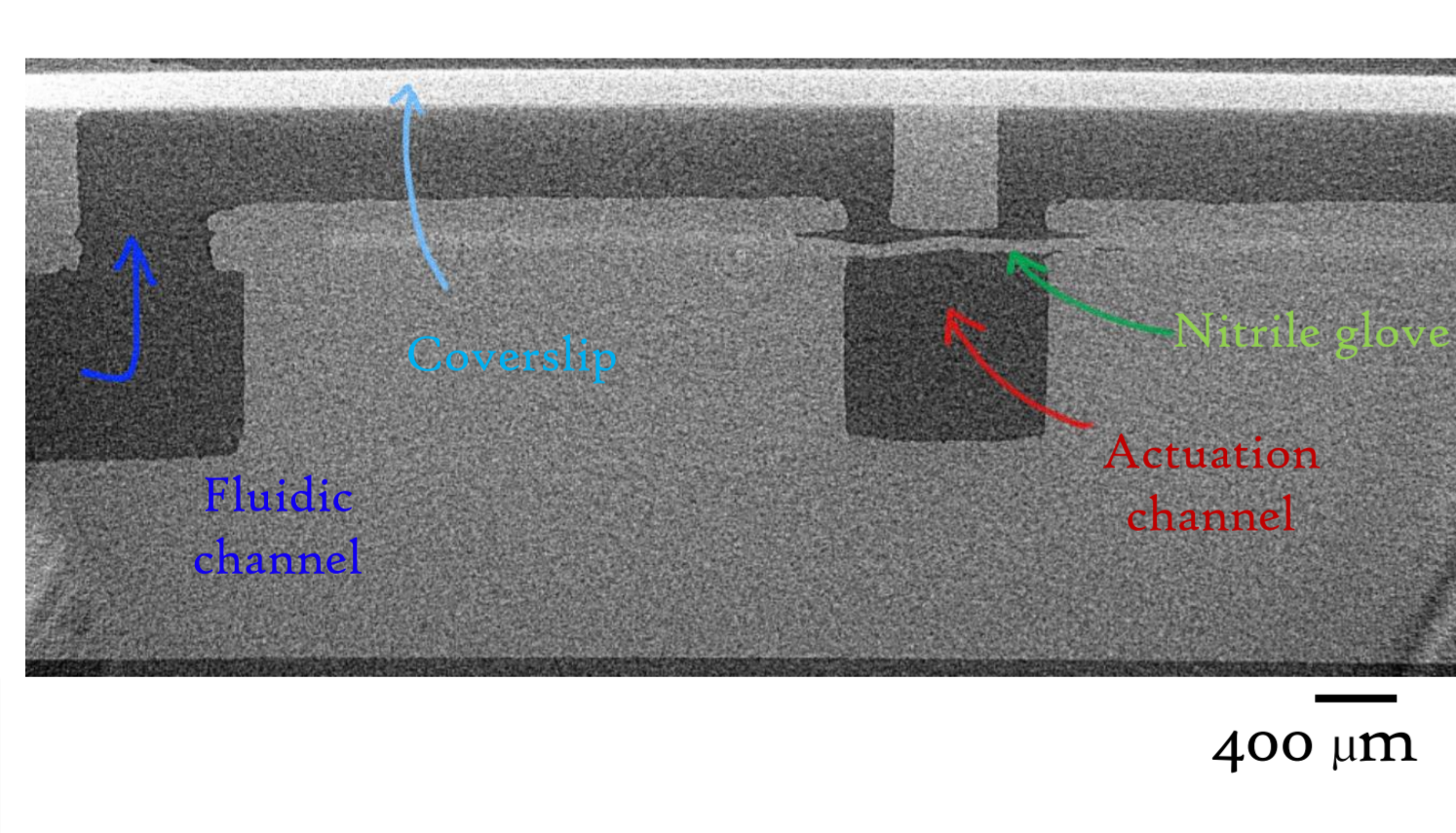
Silanized coverslip integrated after channel printing.



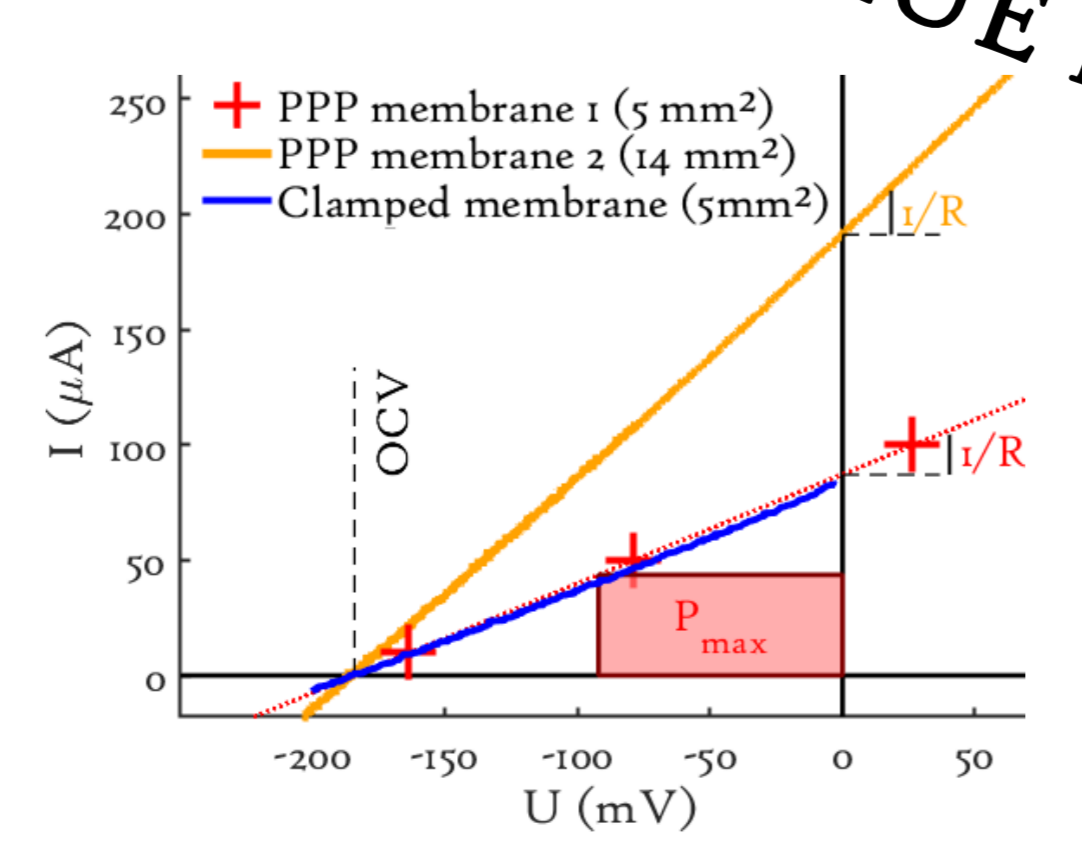
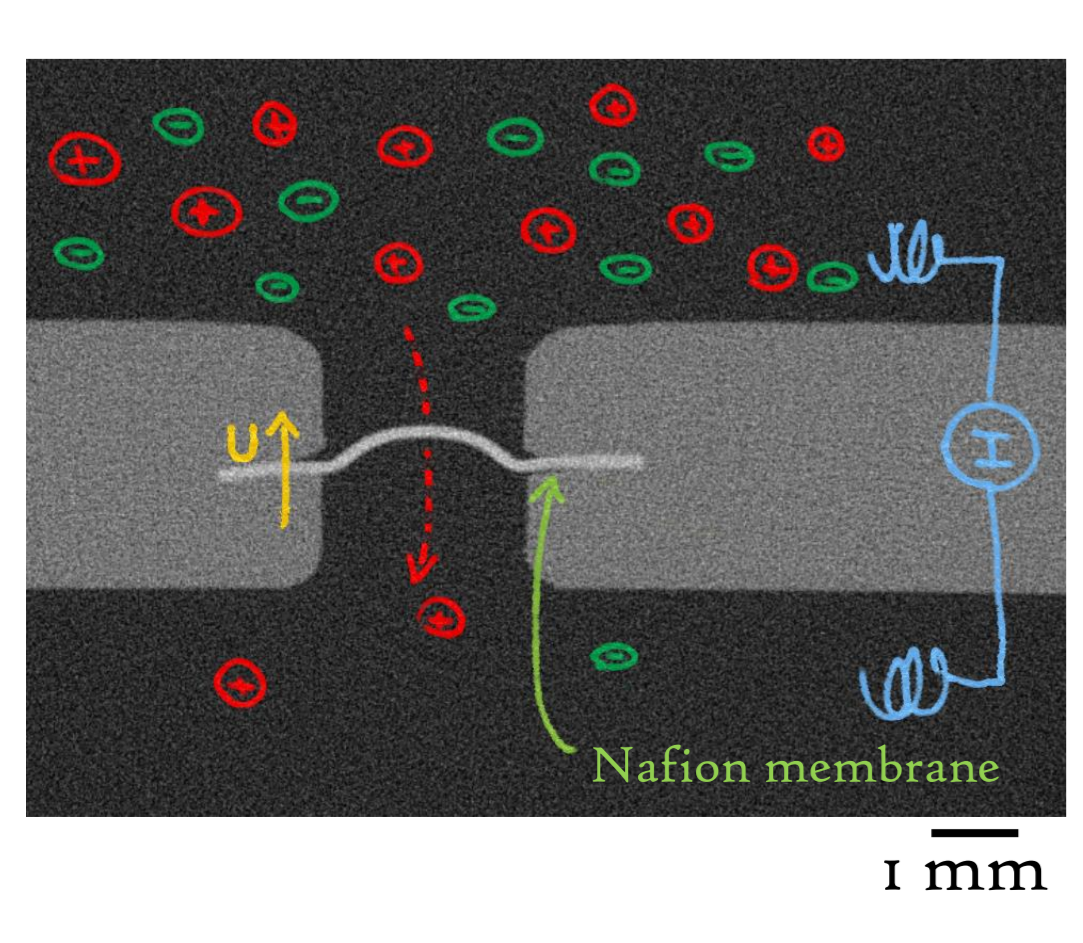
Channel sandwiched between two silanized coverslips.



## ELASTIC MEMBRANE - VALVES



## SEMIPERMEABLE MEMBRANE - BLUE ENERGY

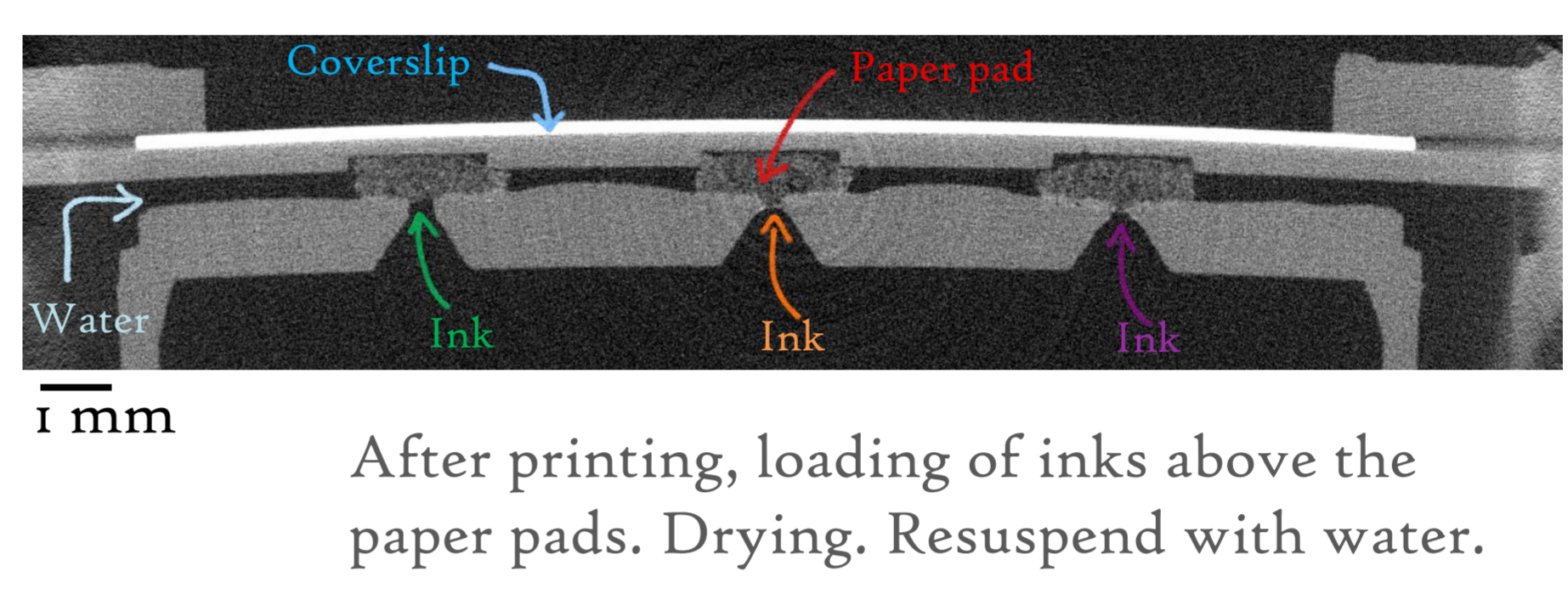


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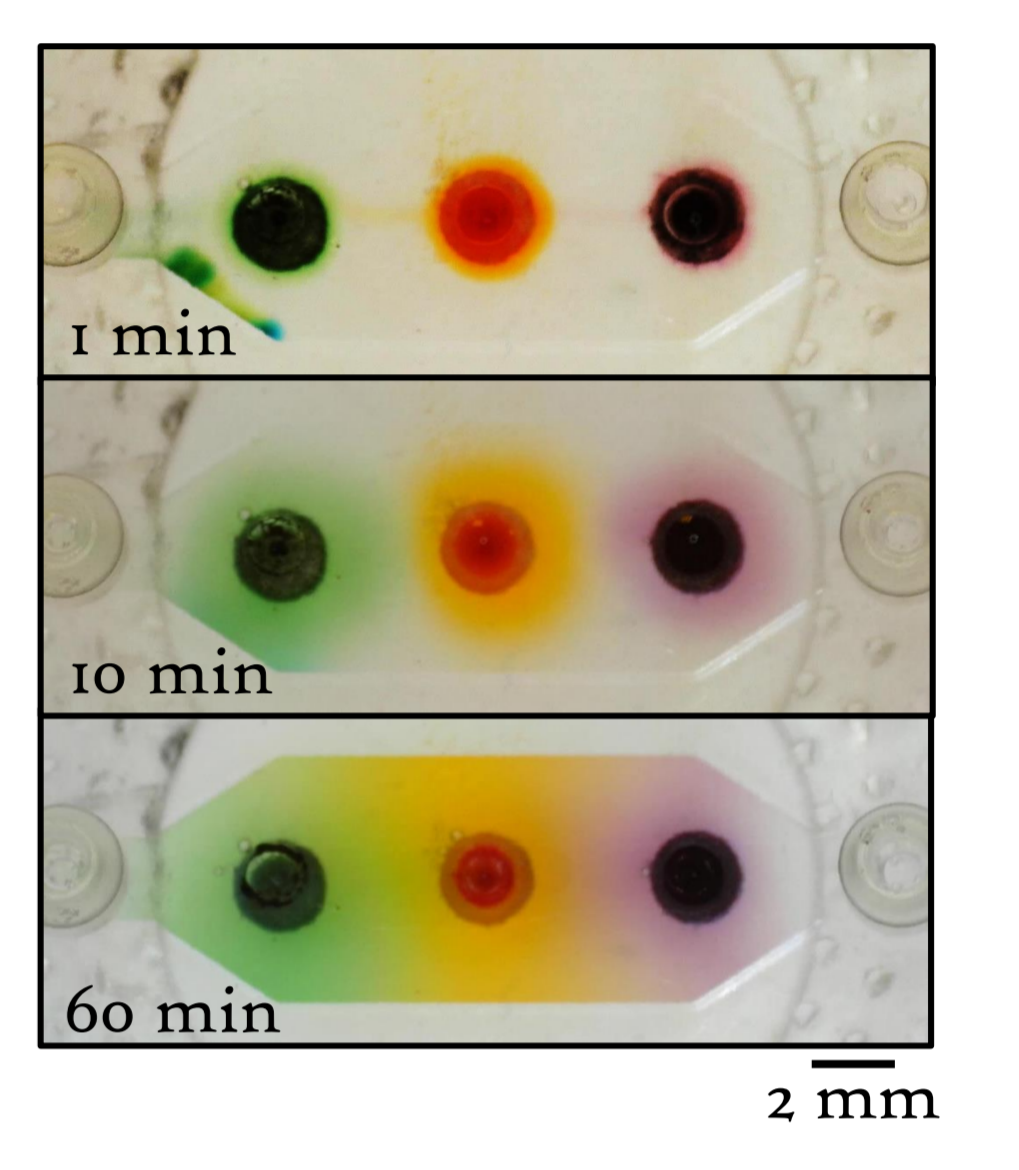
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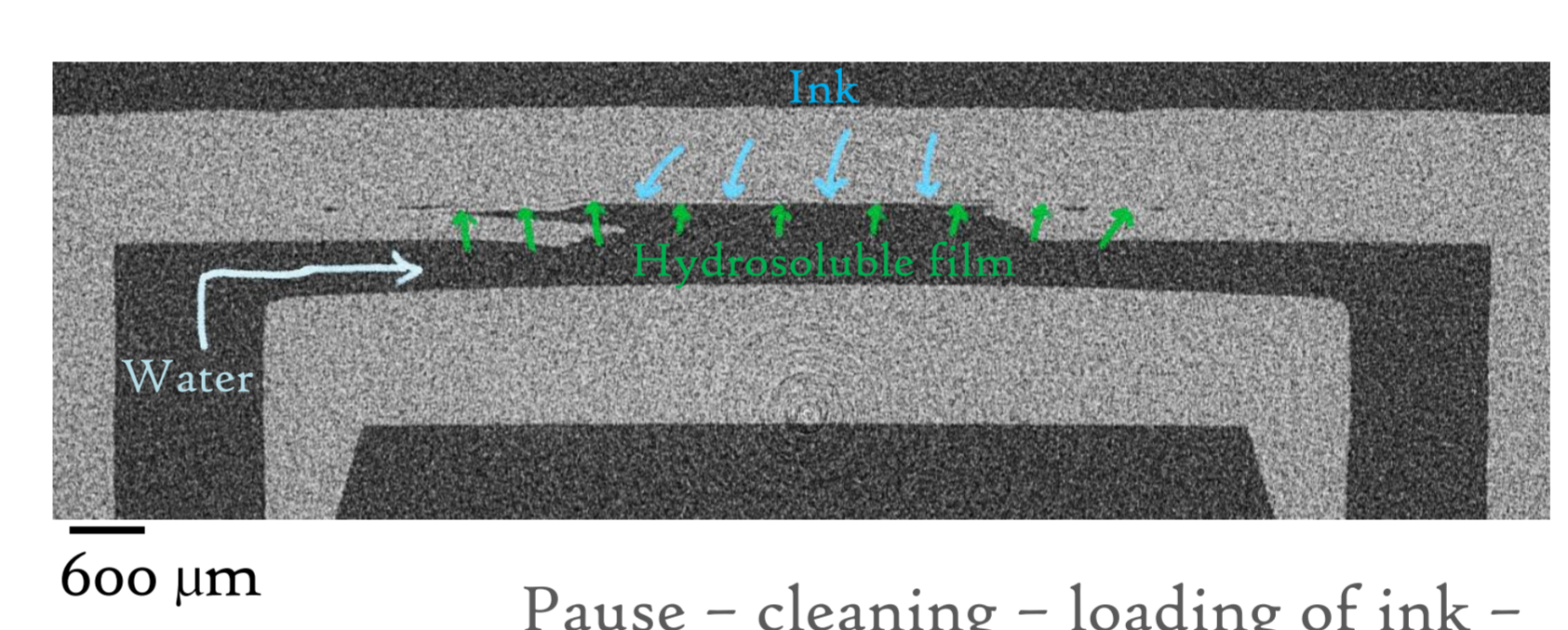
## PAPER PAD - REAGENT STORAGE



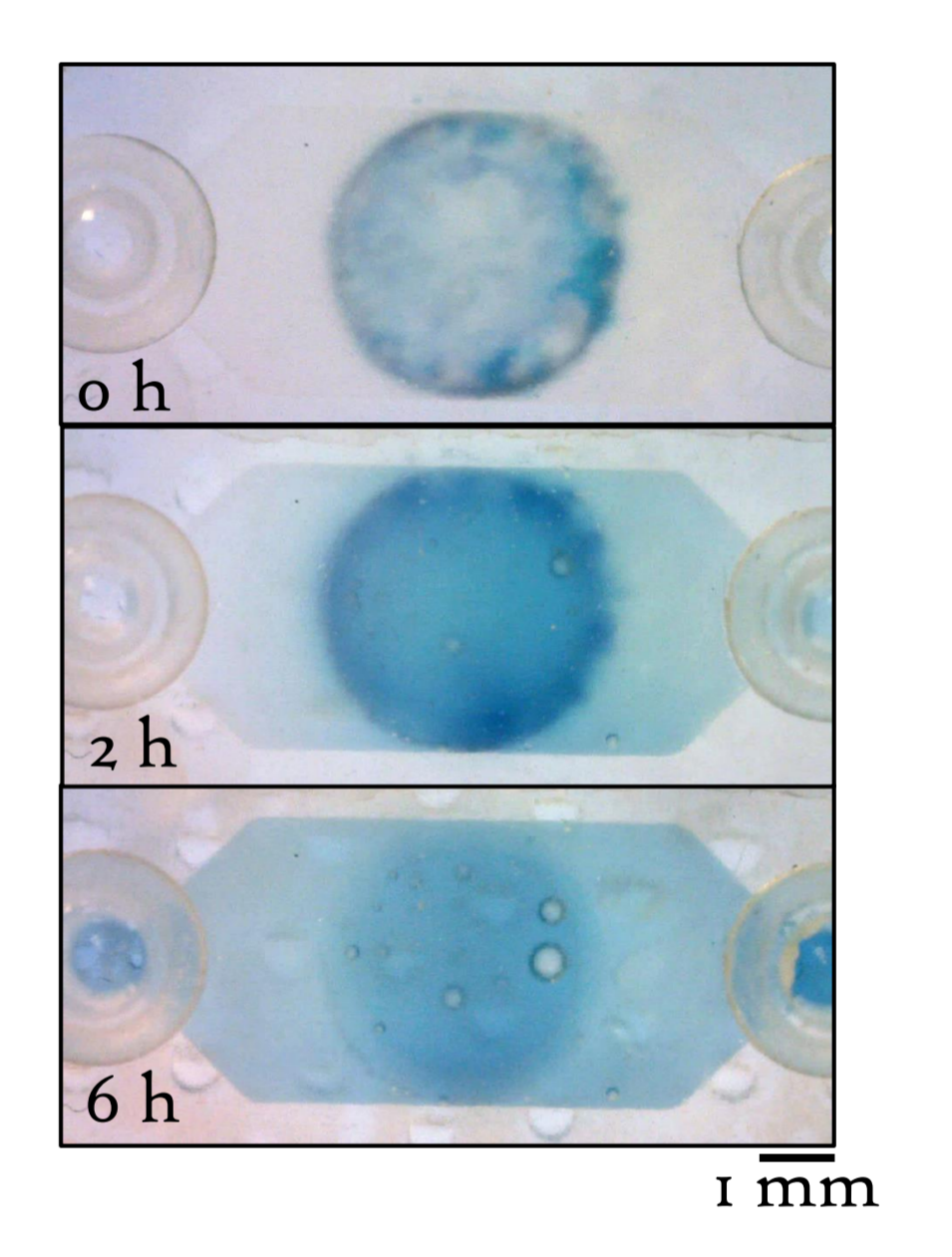
After printing, loading of inks above the paper pads. Drying. Resuspend with water.



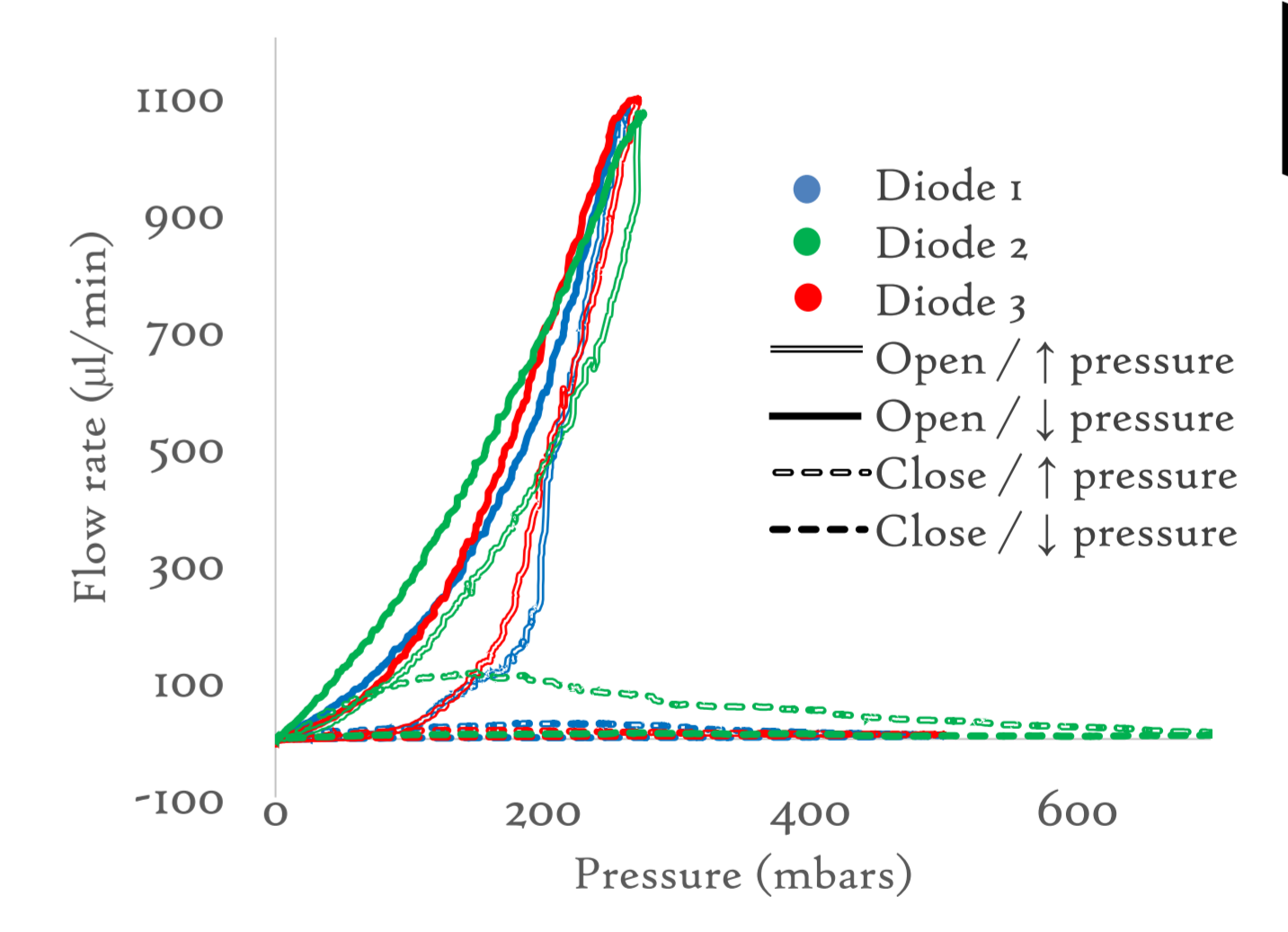
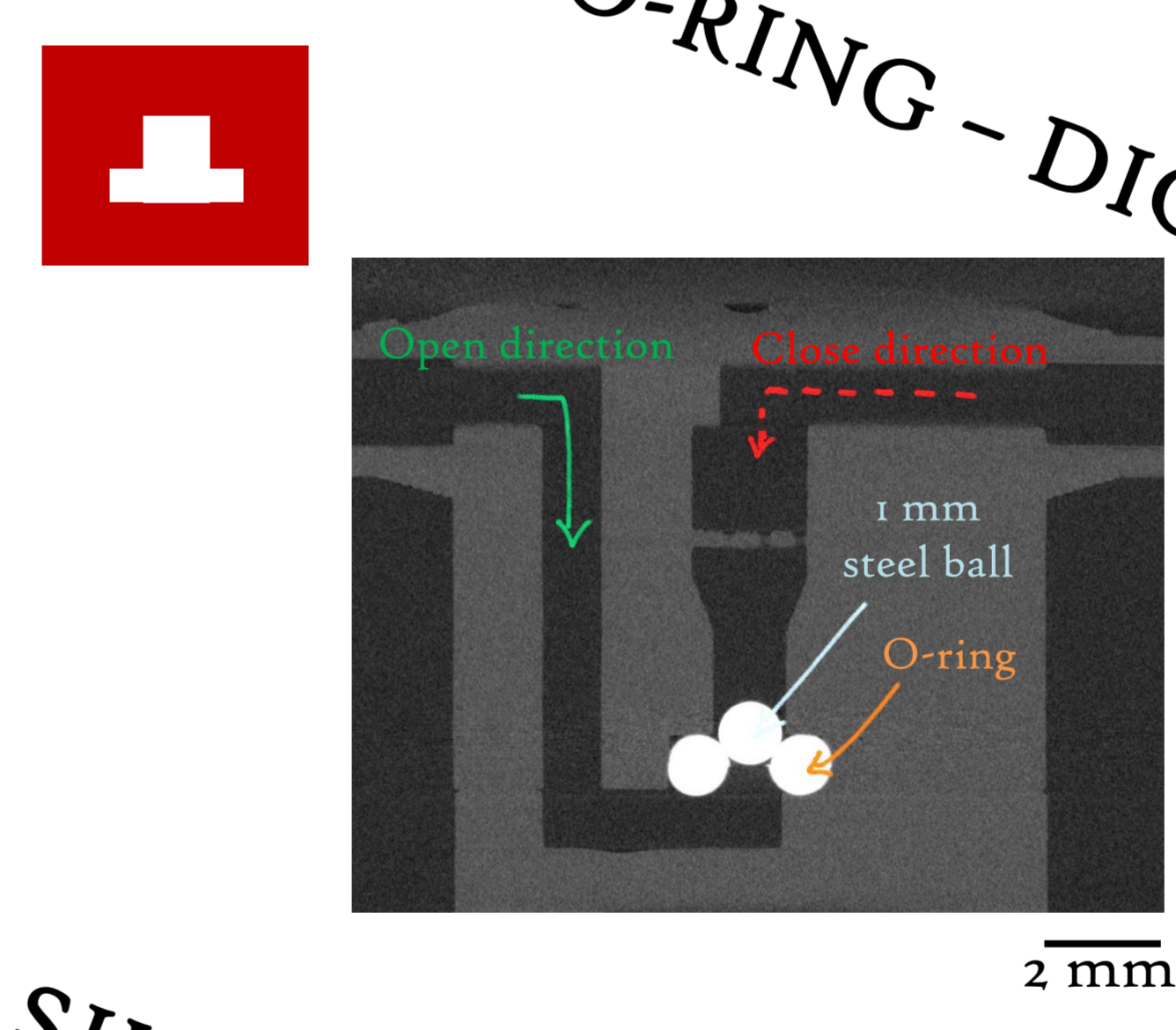
## HYDROSOLUBLE FILM - PROTECTION



Pause - cleaning - loading of ink - drying - add hydro-soluble film - print - develop - resuspend with water.



## BALL AND O-RING - DIODE VALVE



## SILICON FILTER - CELL CAPTURE

