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Function integration in 3D-Printed μ Fluidics using a "Print Pause Print" Strategy

Matthieu Sagot, Elise Bou, Timothée Derkenne, C. Tregouet, Vincent Raimbault, Laurent Malaquin, Bastien Venzac

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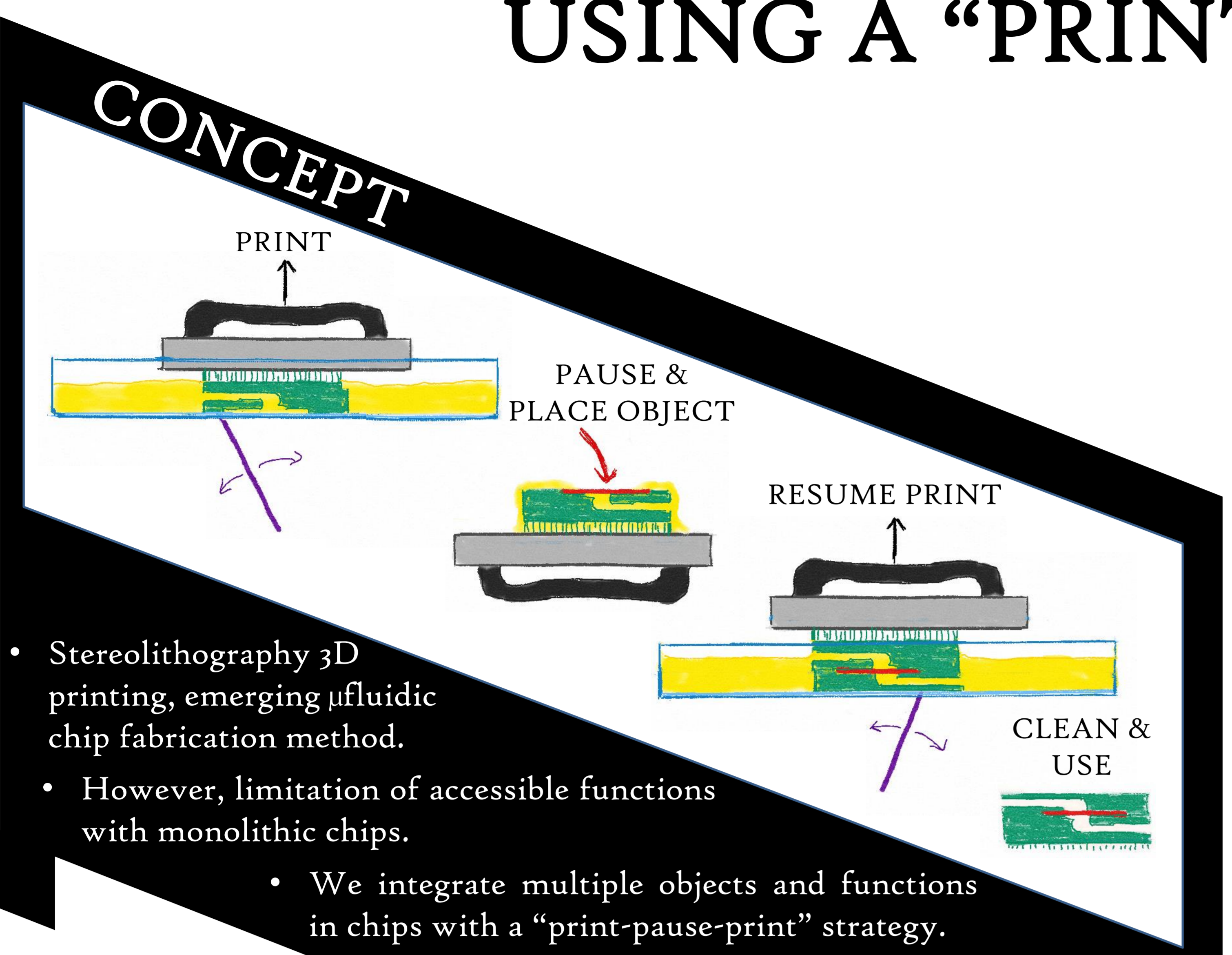
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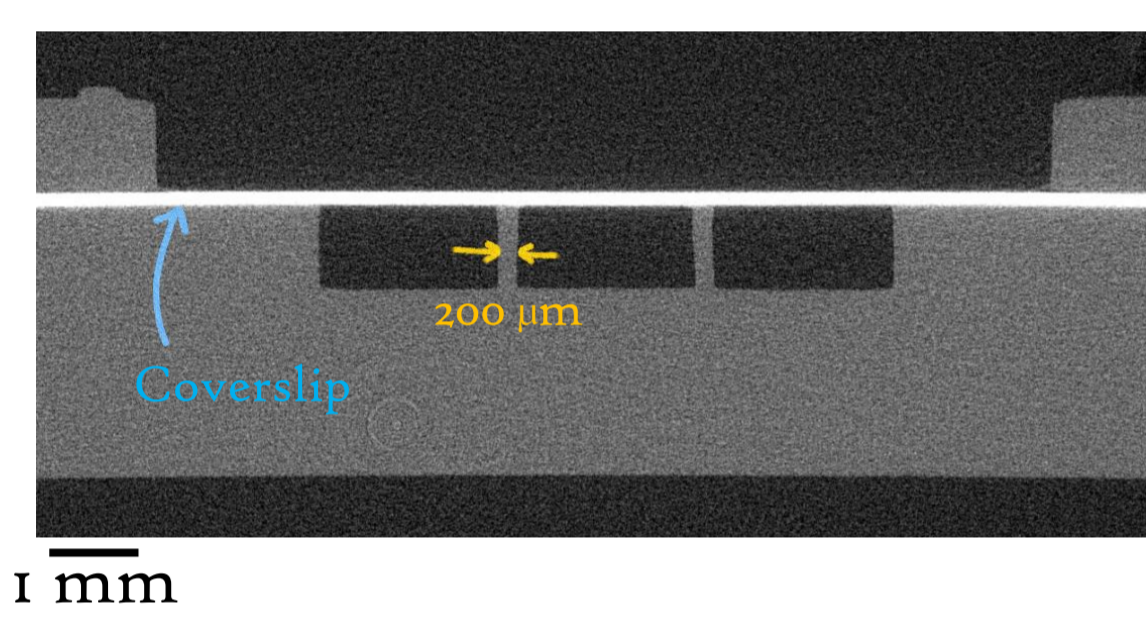
FUNCTION INTEGRATION IN 3D-PRINTED μ FLUIDICS USING A "PRINT-PAUSE-PRINT" STRATEGY



- Stereolithography 3D printing, emerging μ 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

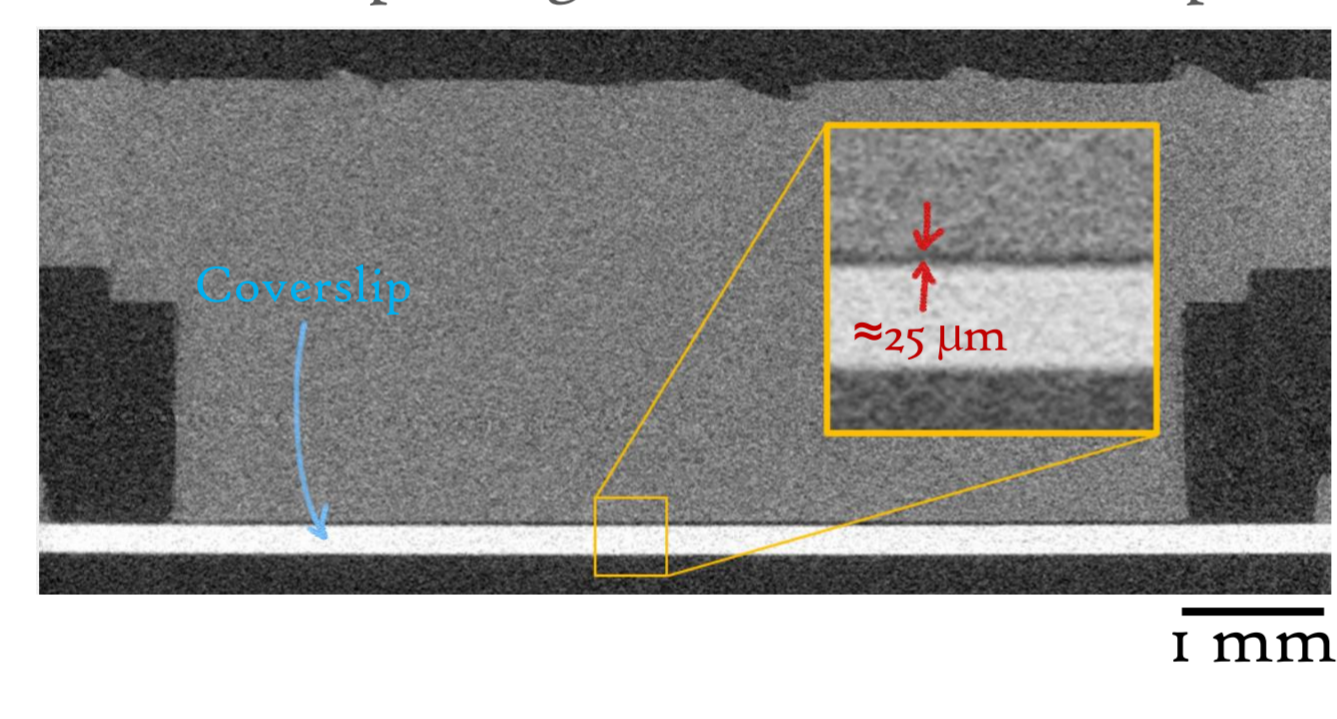
GLASS SLIDE - IMAGING & THIN CHANNELS

Silanized coverslip integrated before channel printing.

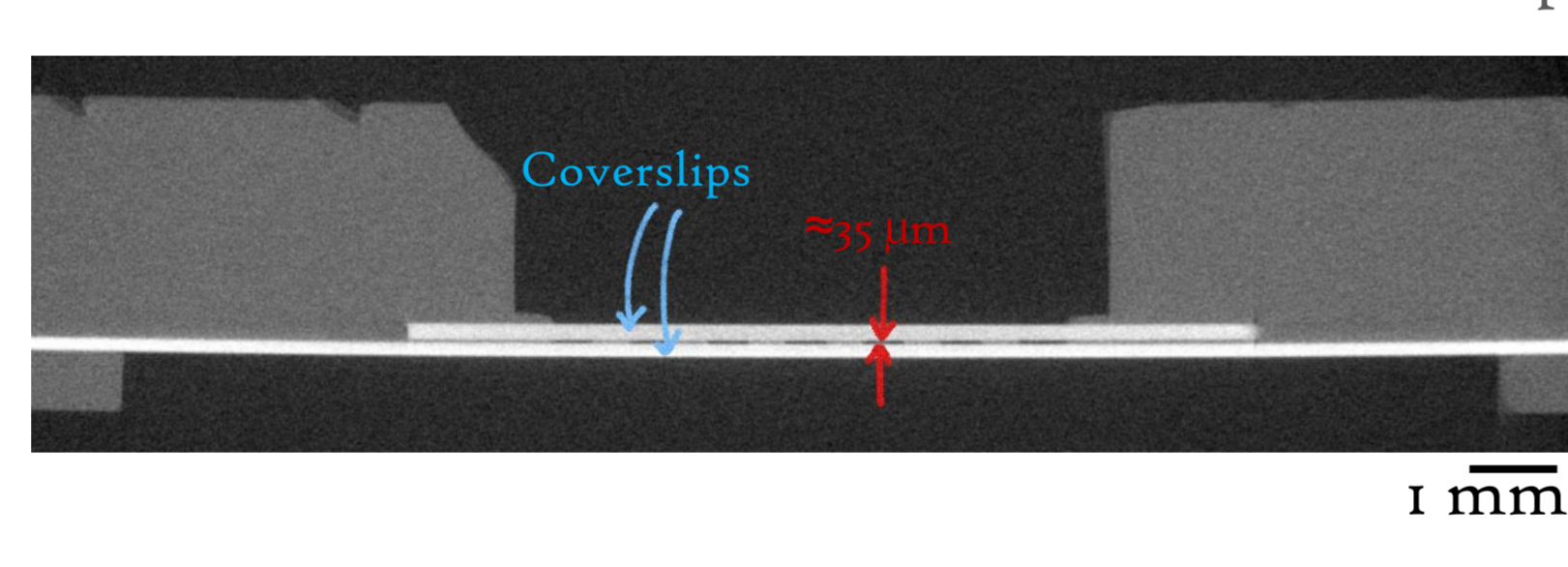


Max pressure	Chip 1	Chip 2	Chip 3
1 mm wall	2 bars	3.6 bars	2.5 bars
500 μ m wall	>4 bars	>4 bars	>3.5 bars
200 μ m wall	>3.5 bars	>3.5 bars	3.2 bars

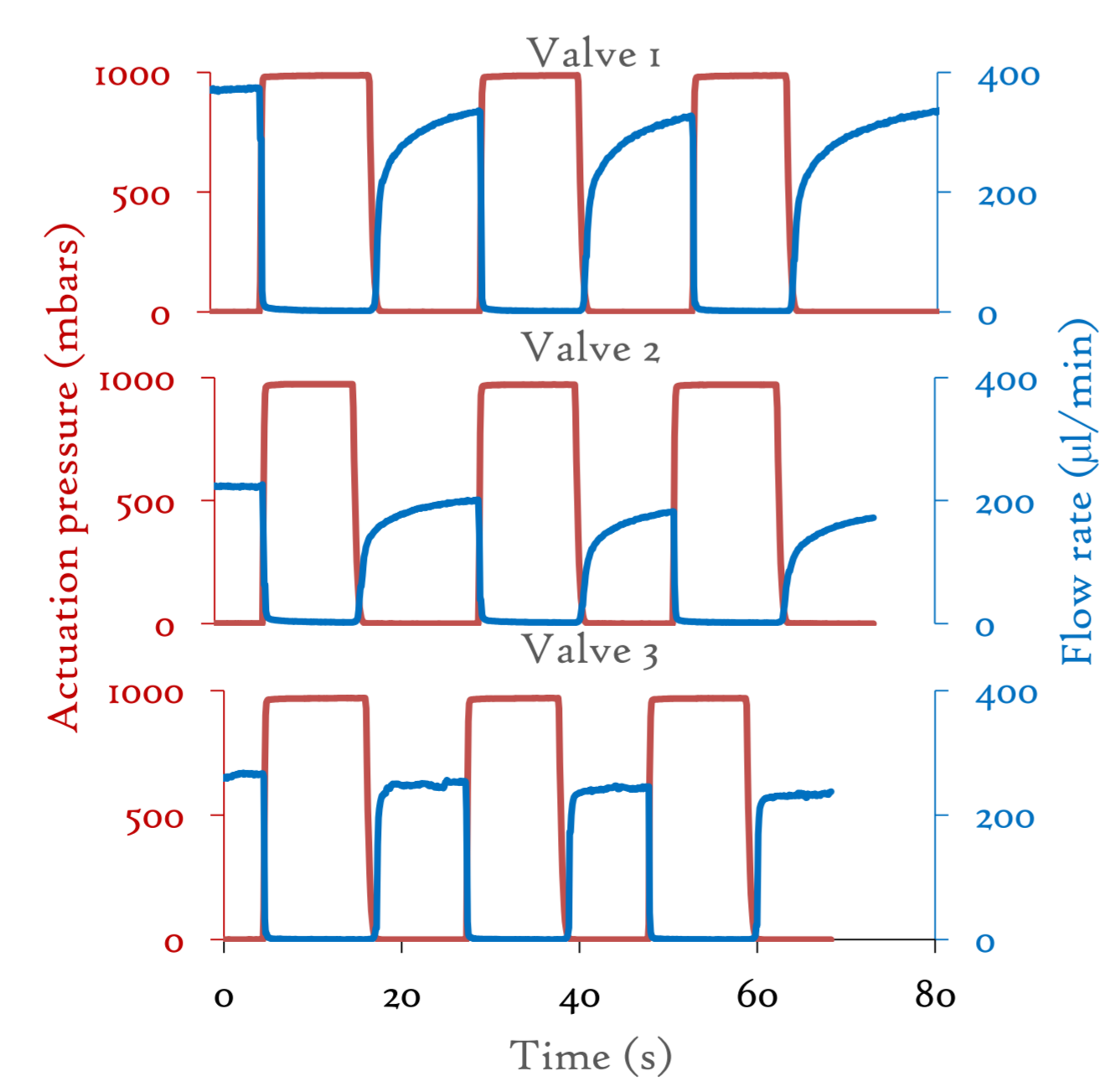
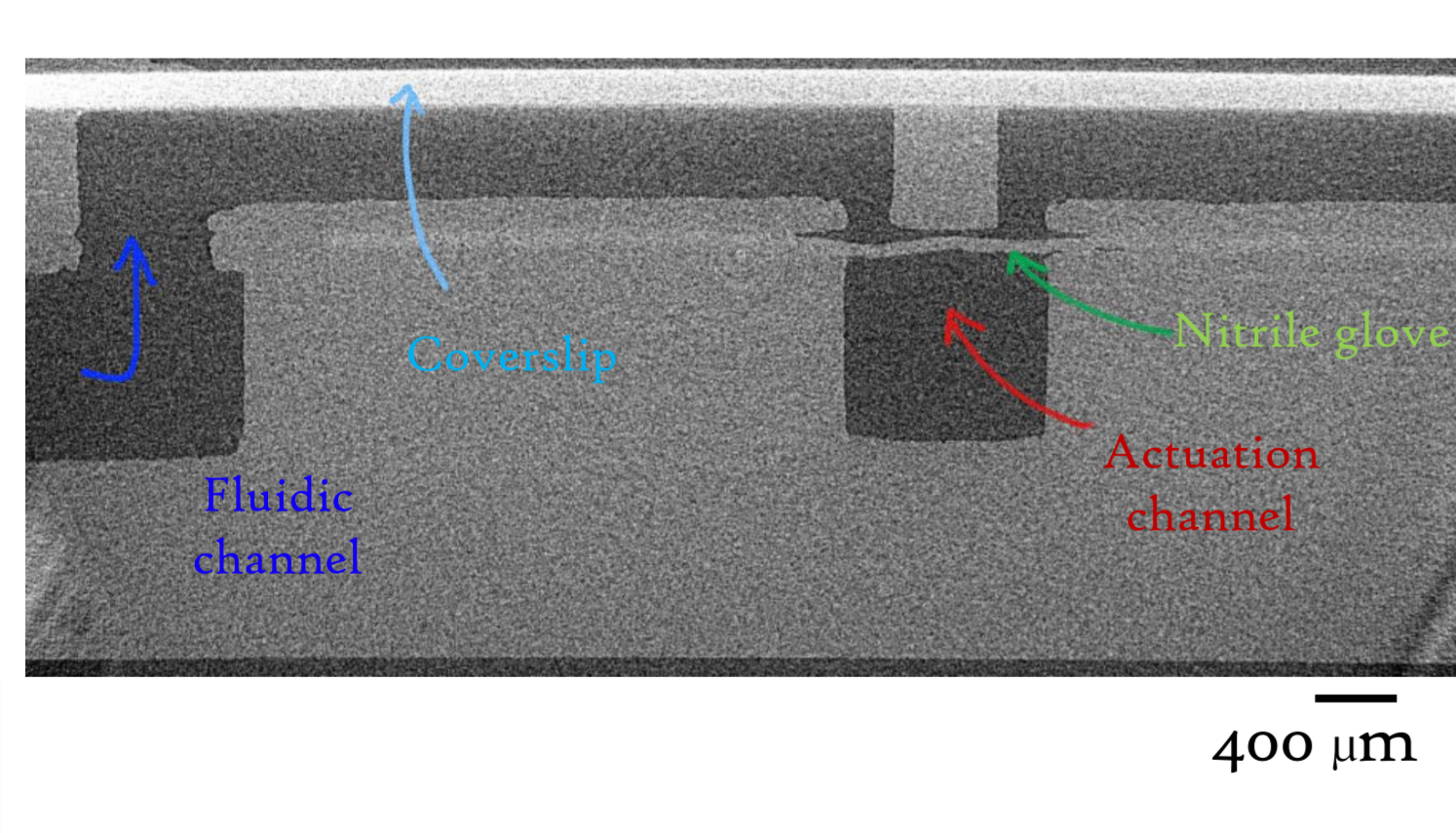
Silanized coverslip integrated after channel printing.



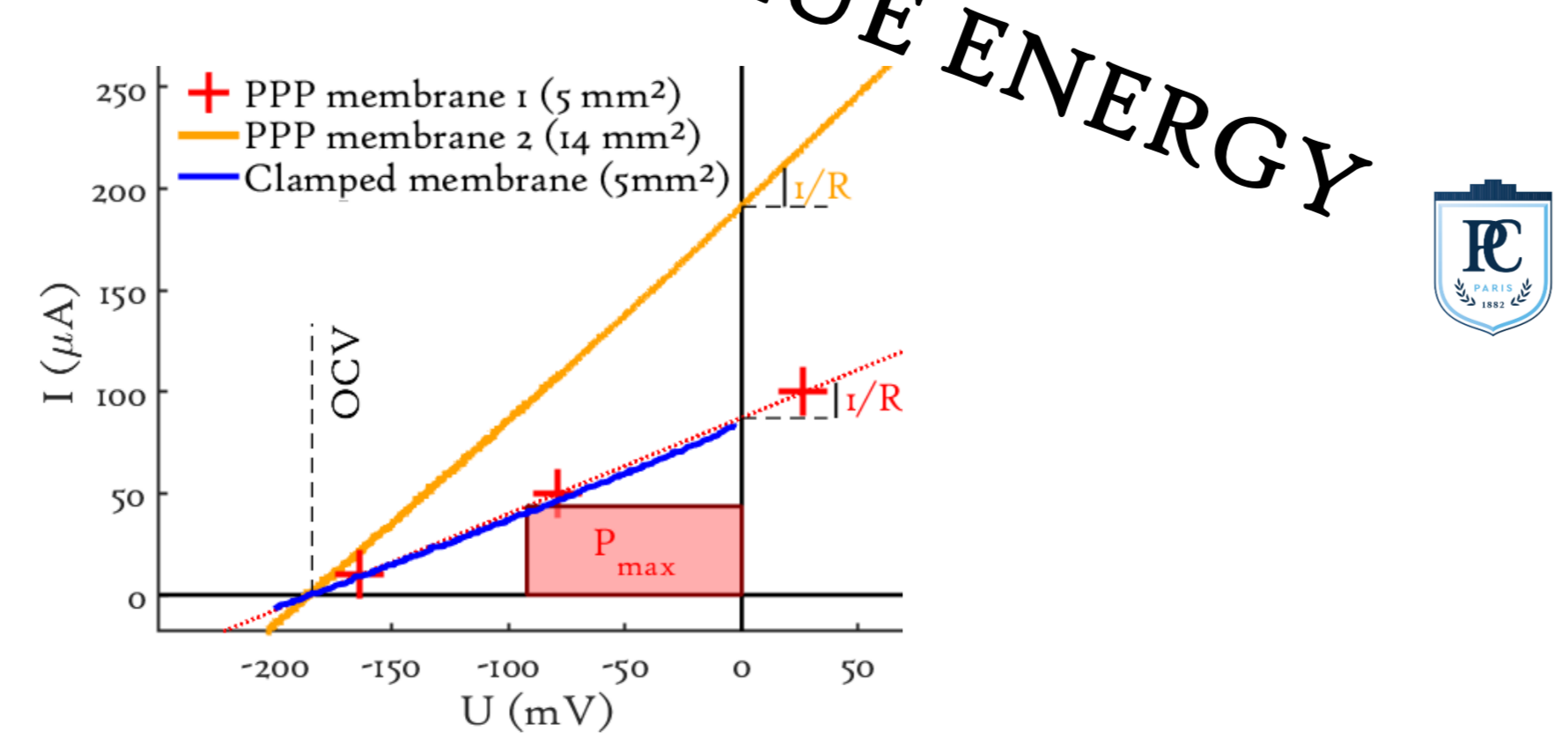
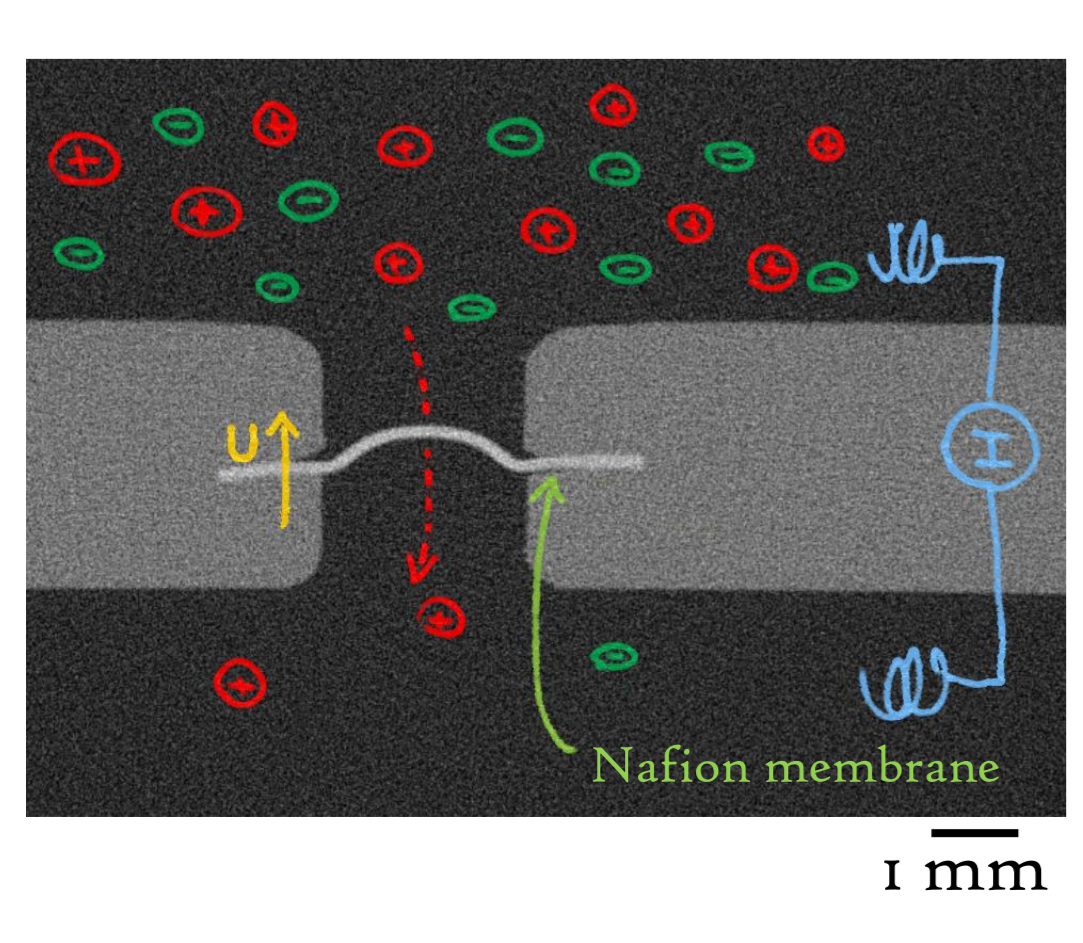
Channel sandwiched between two silanized coverslips.



ELASTIC MEMBRANE - VALVES



SEMIPERMEABLE MEMBRANE - BLUE ENERGY

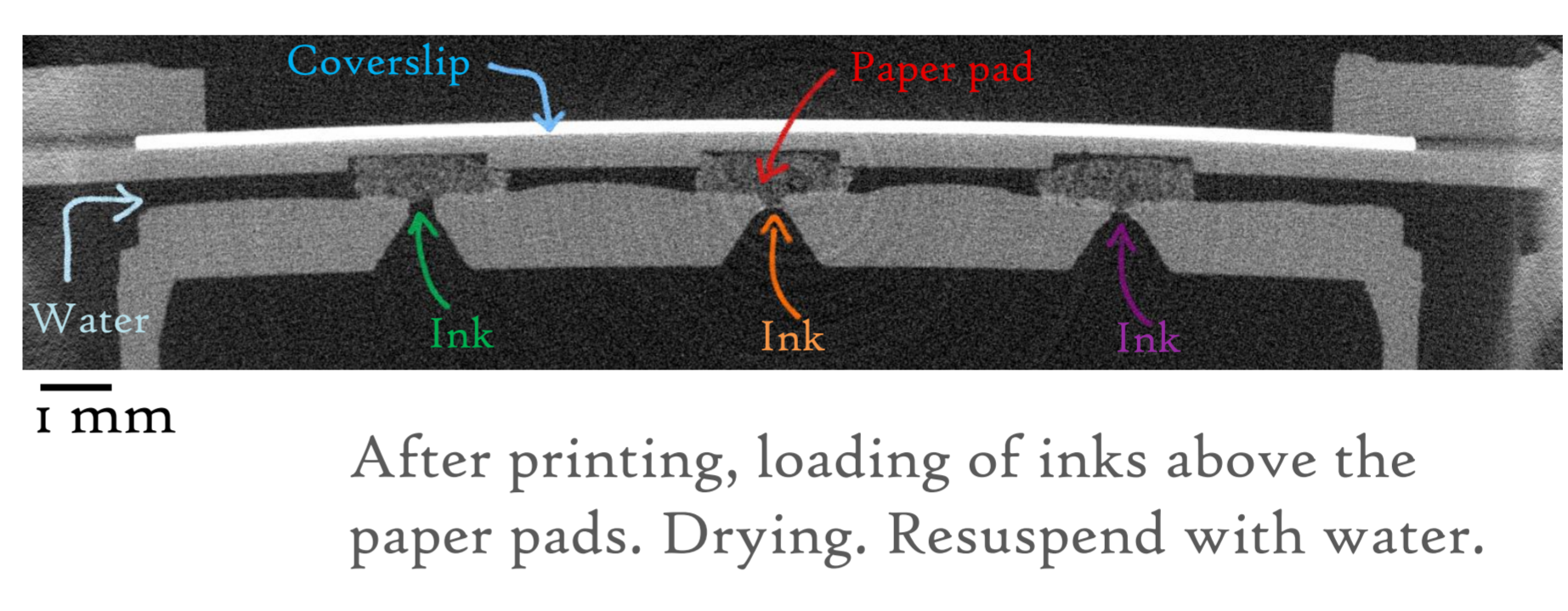


1 **SMART CATCH**
Toulouse, France
Matthieu Sagot^{1,3}
Elise Bou^{1,3}

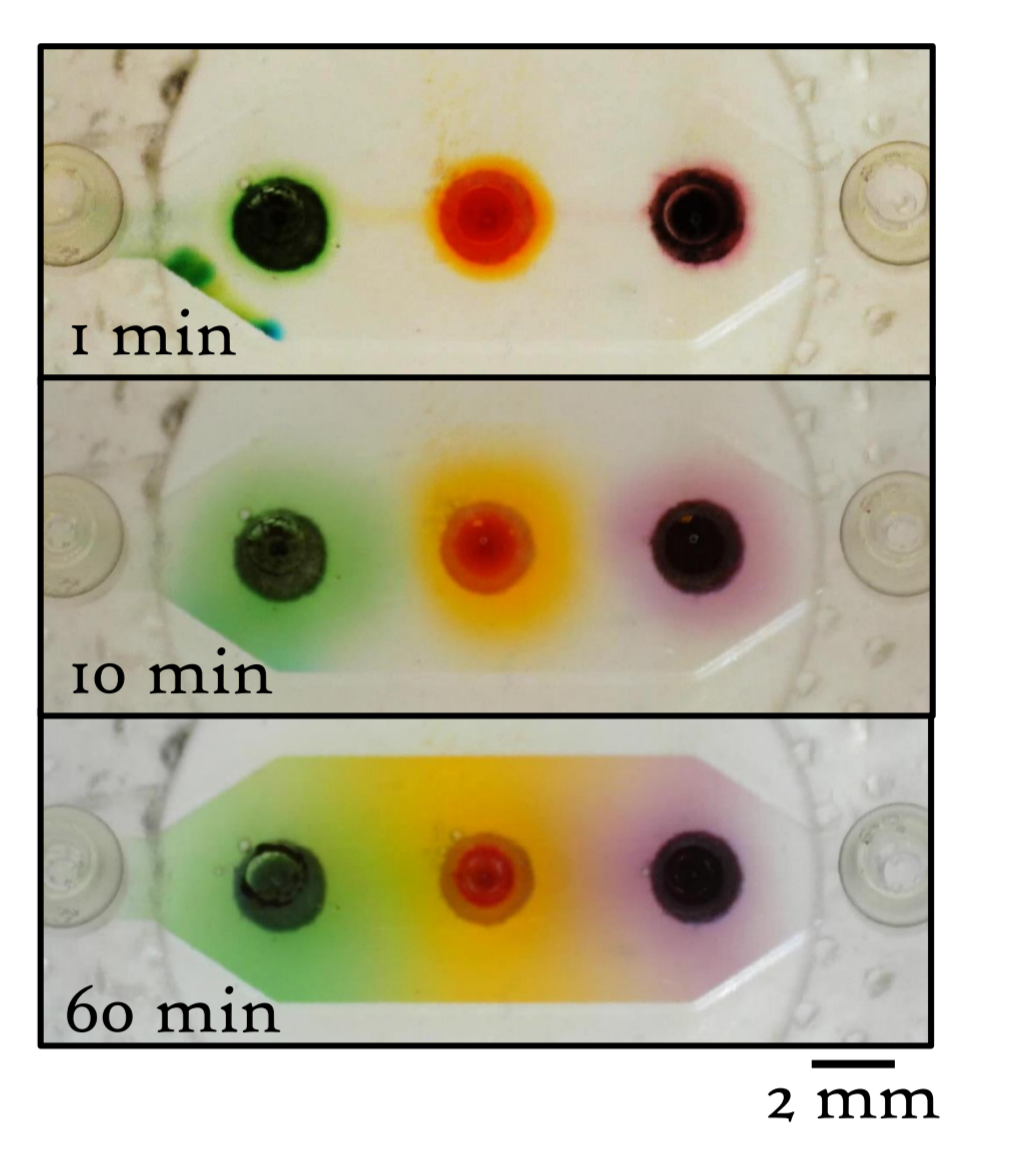
2 **PC**
Paris, France
Timothée Derkenne²
Corentin Tregouet²

3 **LAAS CNRS**
Toulouse, France
Vincent Raimbault³
Laurent Malaquin³
Bastien Venzac³
bastien.venzac@laas.fr

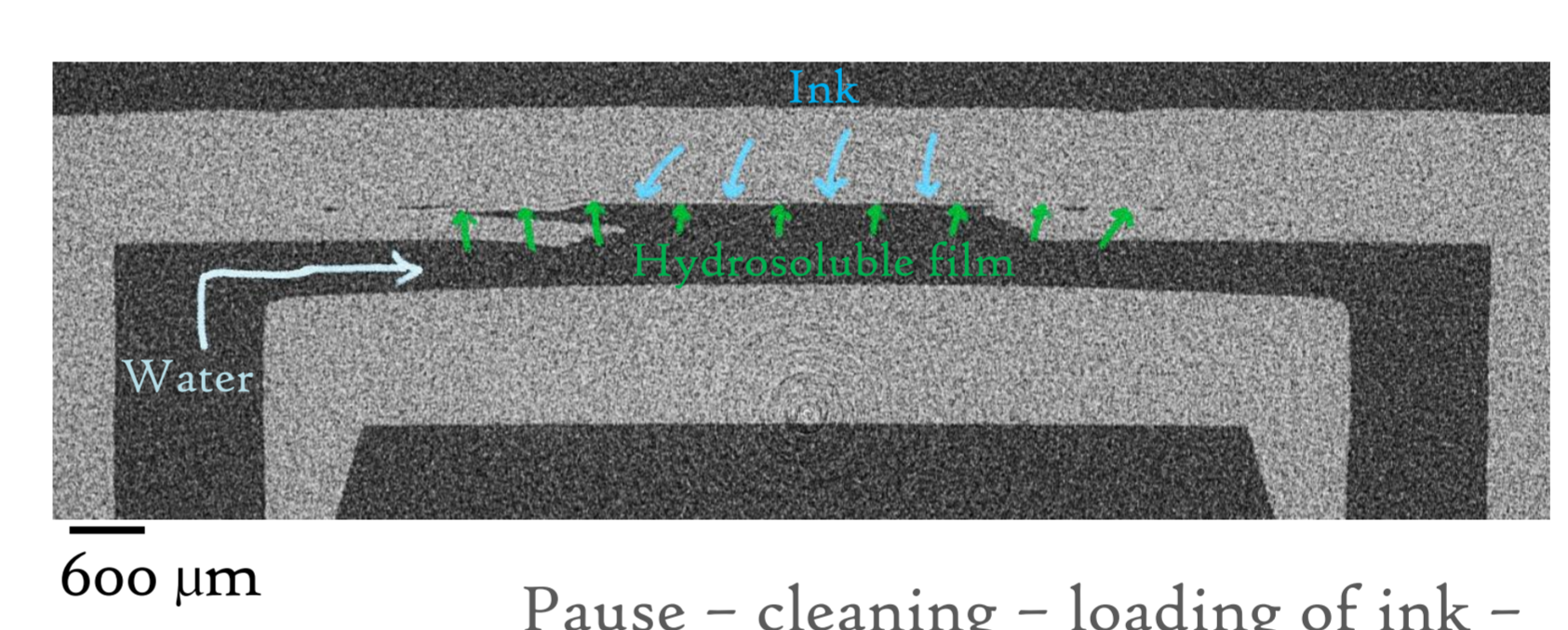
PAPER PAD - REAGENT STORAGE



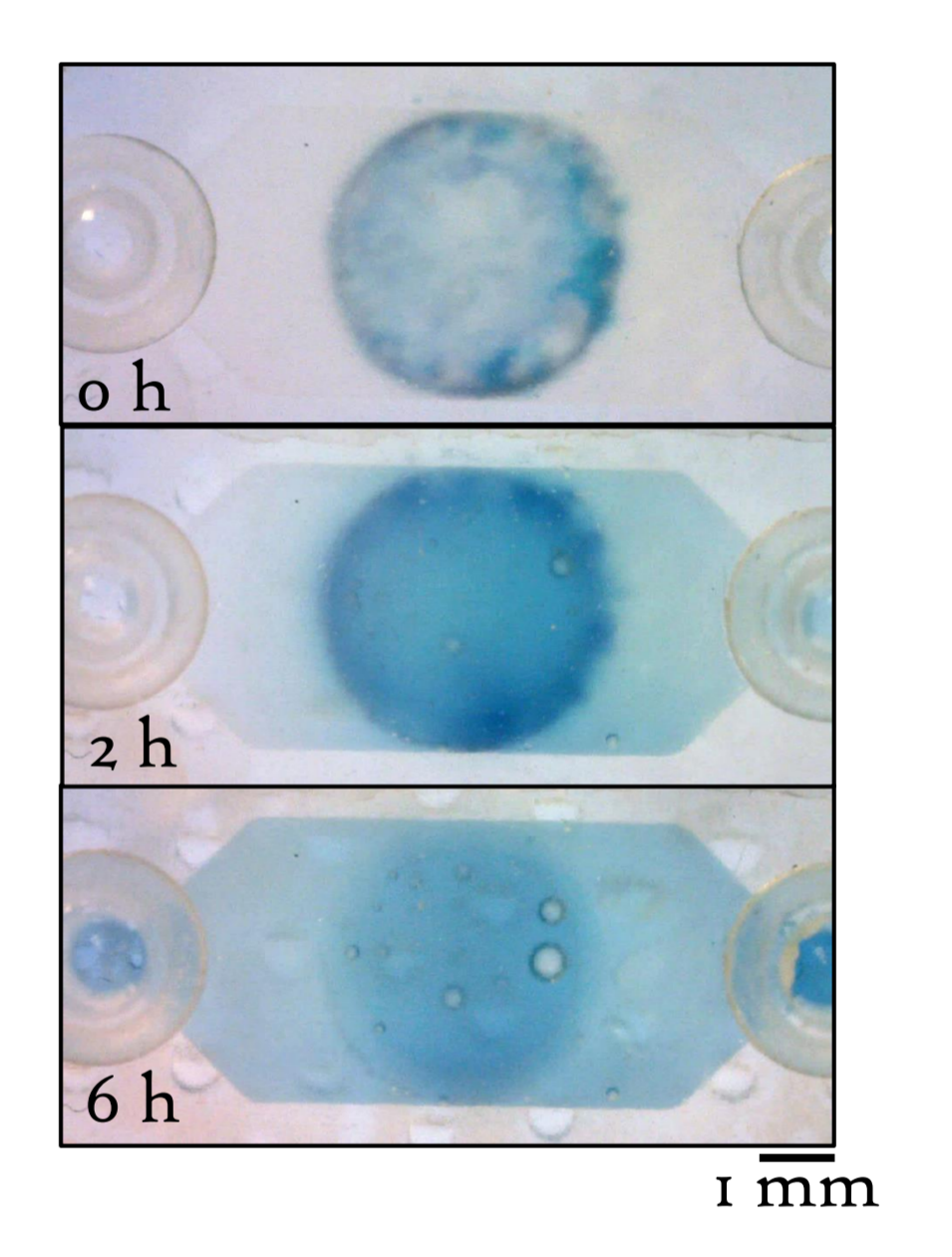
After printing, loading of inks above the paper pads. Drying. Resuspend with water.



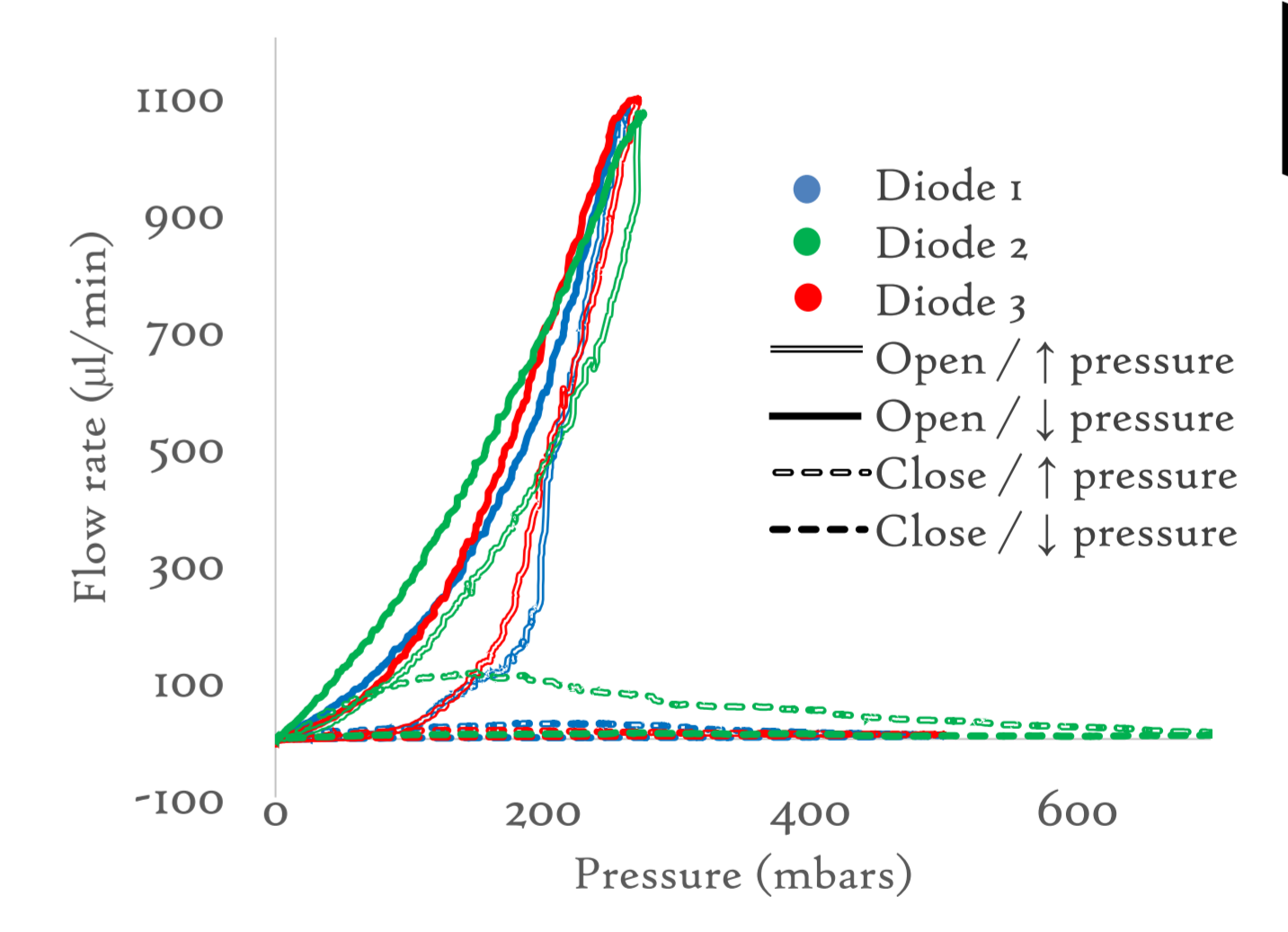
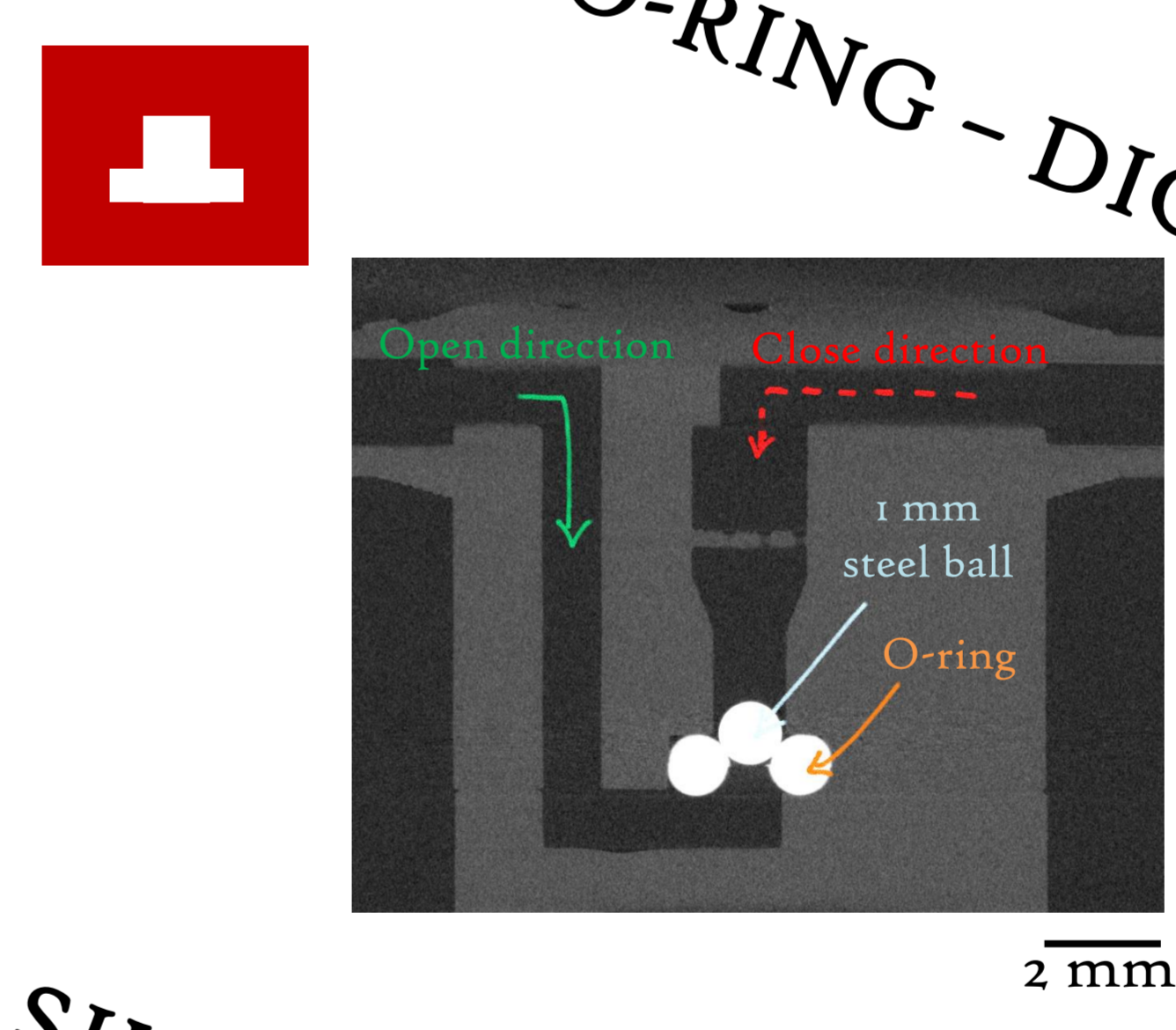
HYDROSOLUBLE FILM - PROTECTION



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

