



## Corchea: paper-based microfluidic device

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### ABSTRACT

Corchea is a paper-based microfluidic system for culture and communicate bacteria on flow. Its has a hardware that you can make with a 3D printer and laser cut. The system allows the directed communications between biofilms and we aim to array biological logic gates on it to make complex information processing.

### PROTOCOL STATUS

#### In development

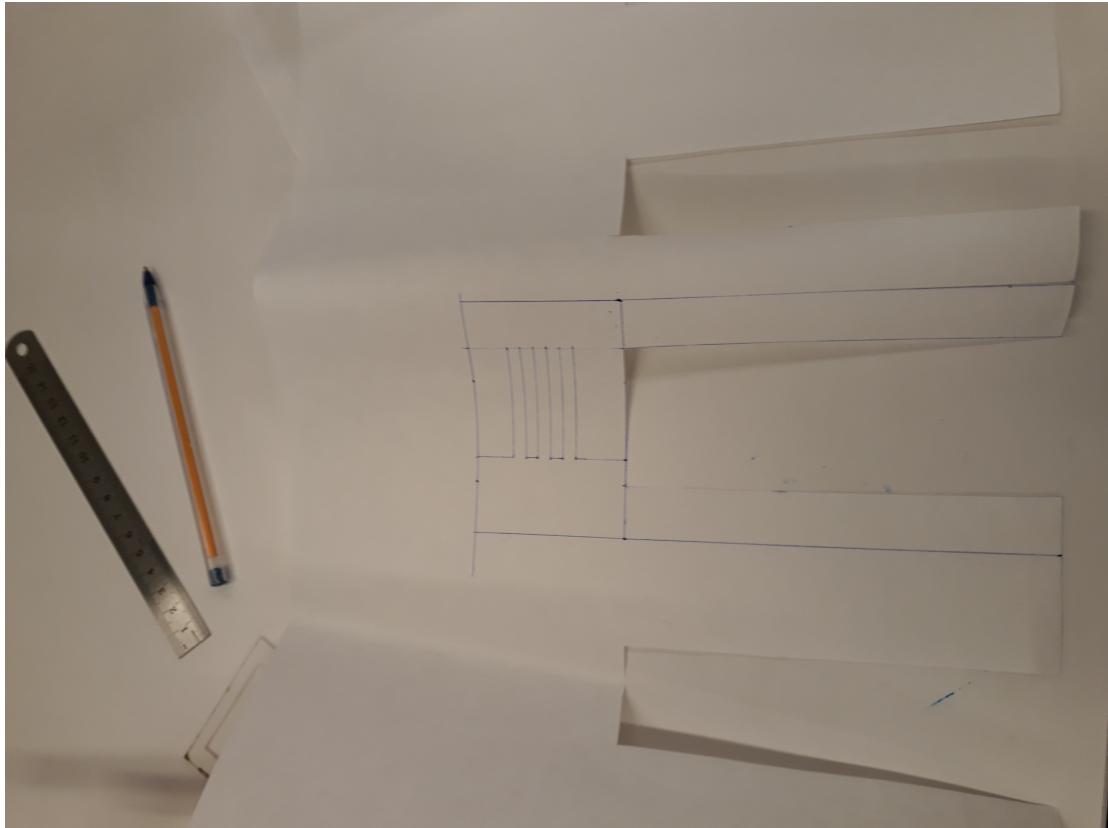
We are still developing and optimizing this protocol

### MATERIALS

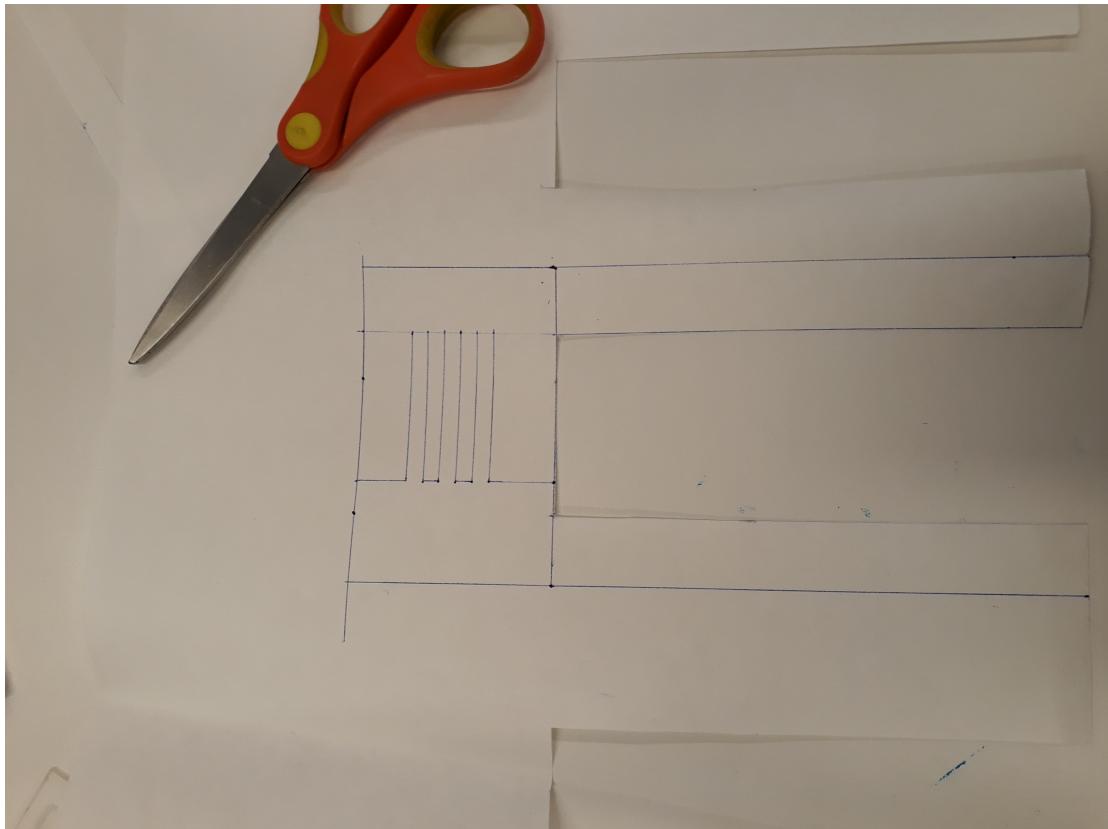
NAME	CATALOG #	VENDOR
#1 Whatman paper	1001-150	Coorstek
Acrylic Sheet	<a href="#">View</a>	McMaster-Carr
Scissors	HCT7.1	Carl Roth
Z-ABS	<a href="#">View</a>	
Crayon	<a href="#">View</a>	

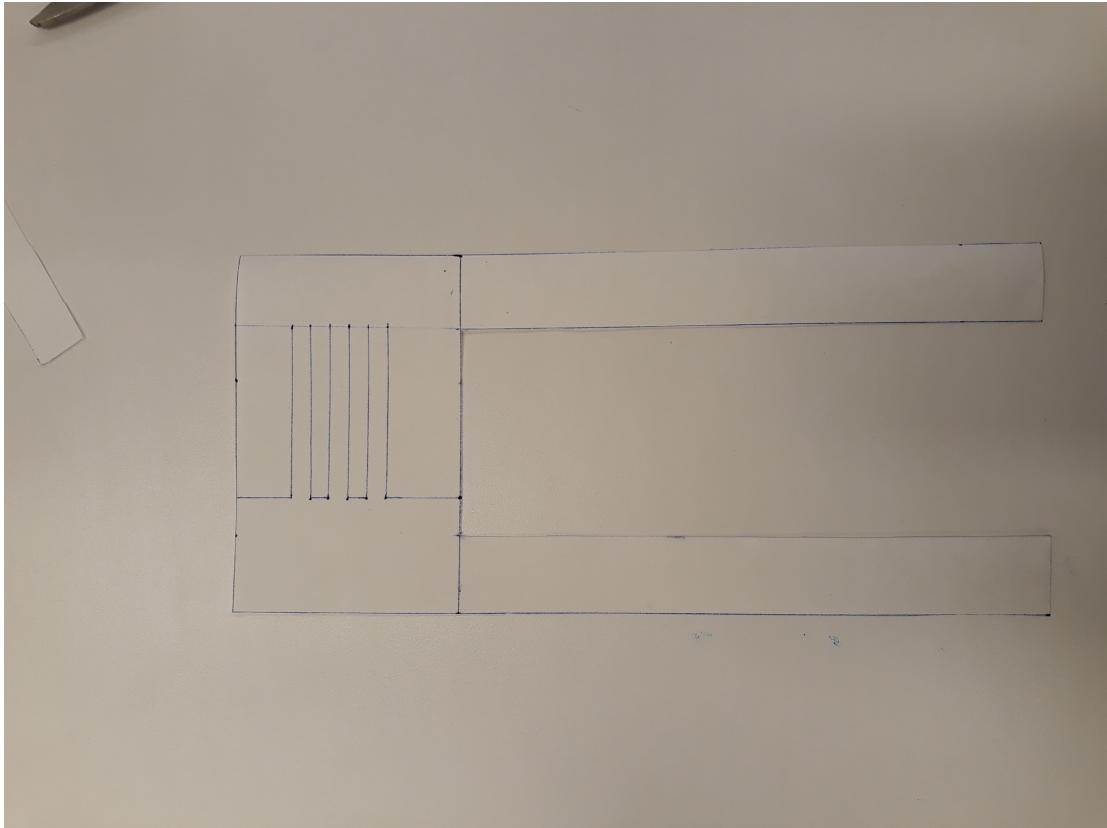
### Paper design

- 1 Draw the borders of your device and the future channels in your paper (#1 Whatman)

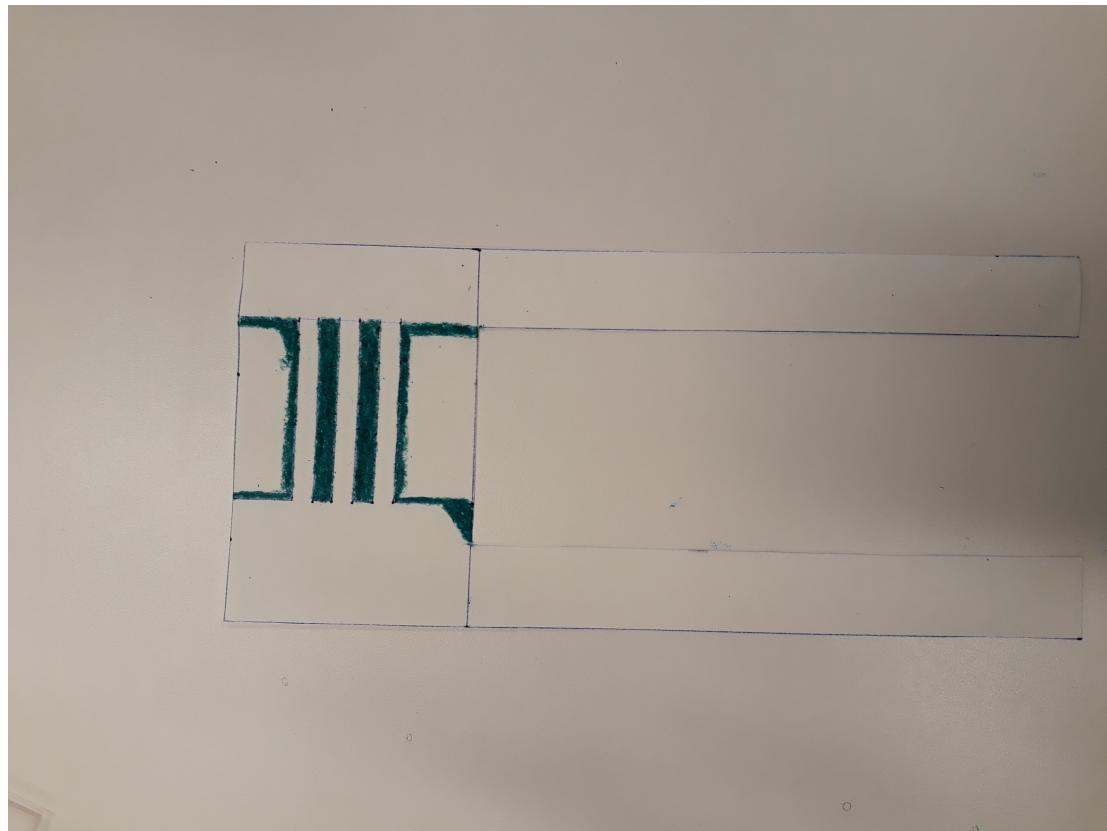


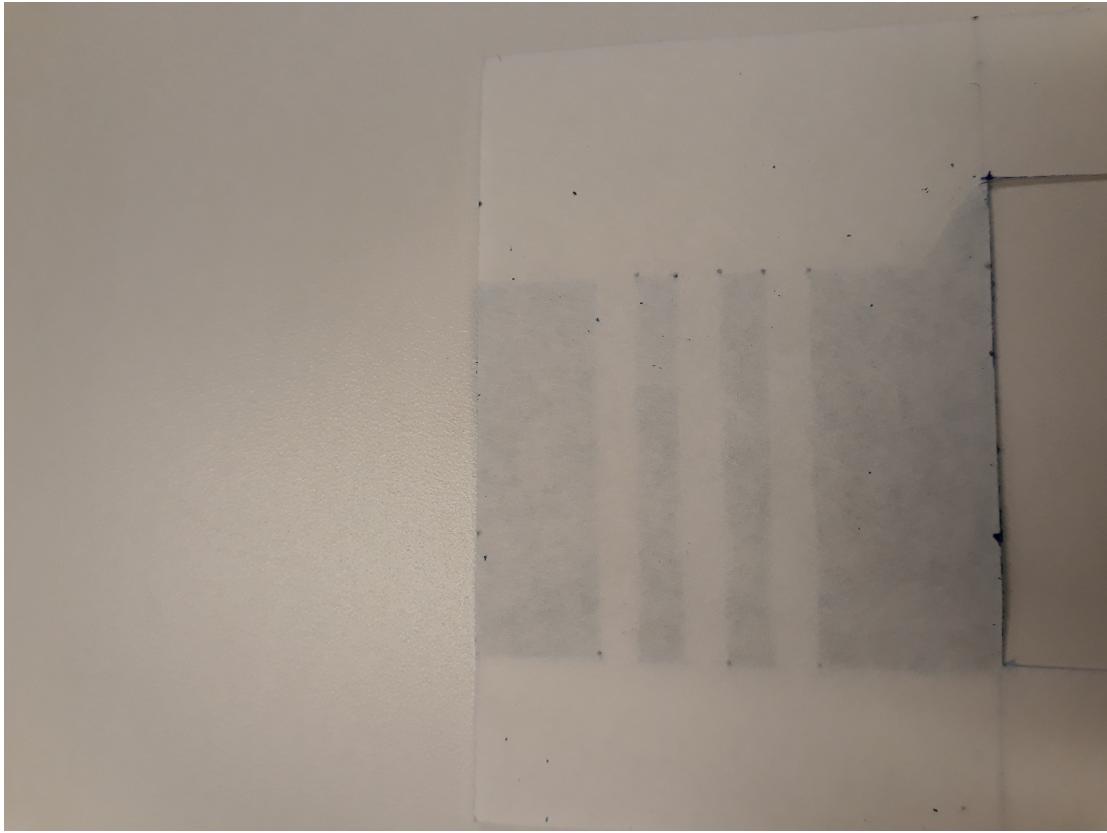
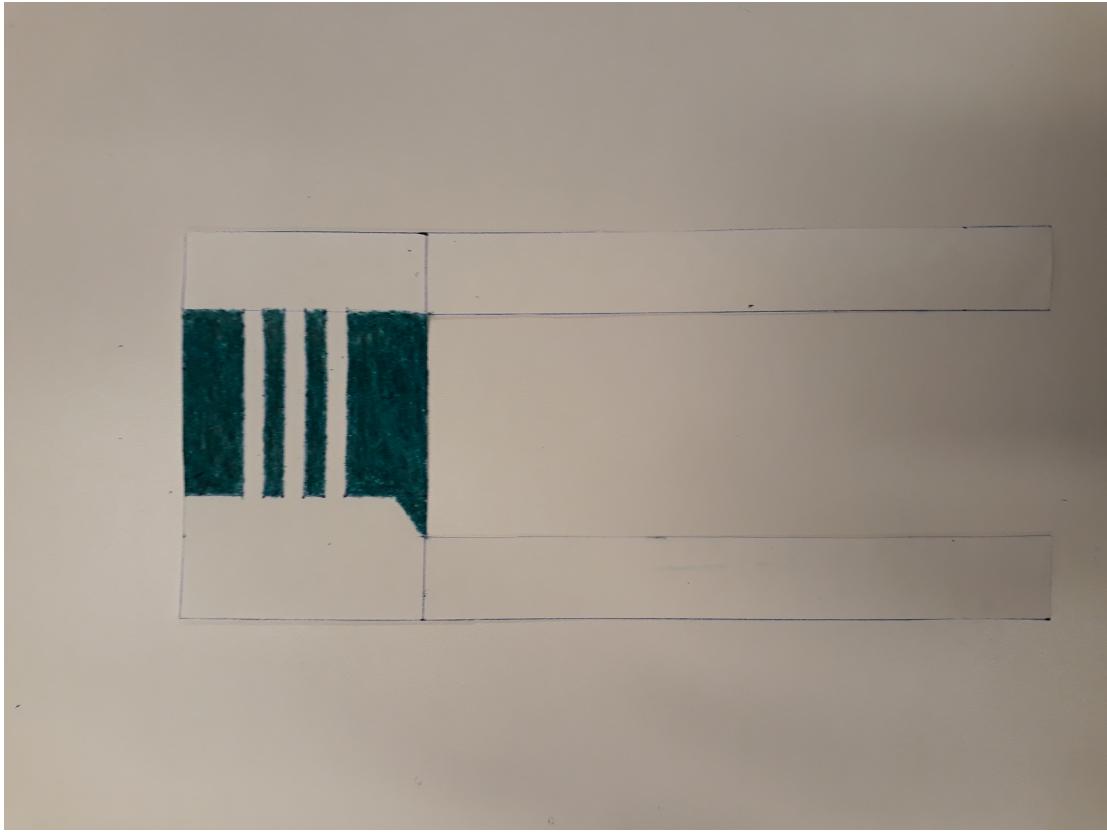
2 Cut the borders





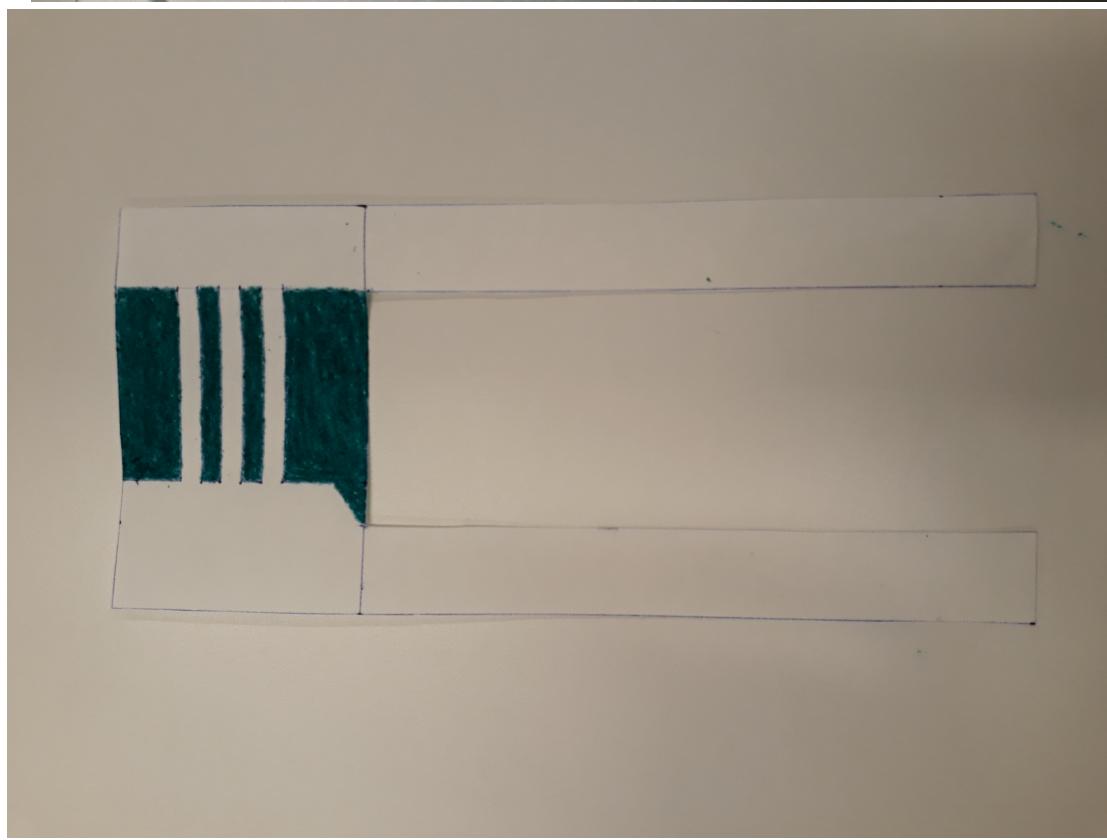
3 Fill with wax crayons all the parts that you dont want the fluid pass

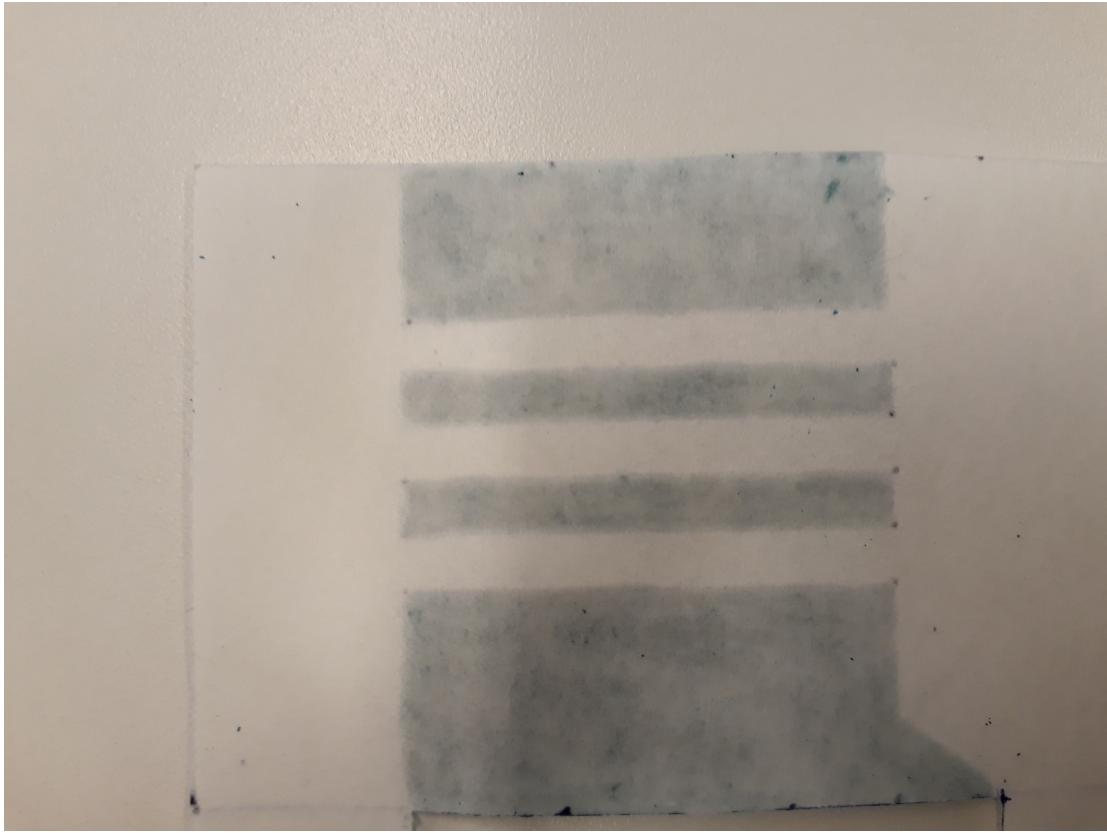
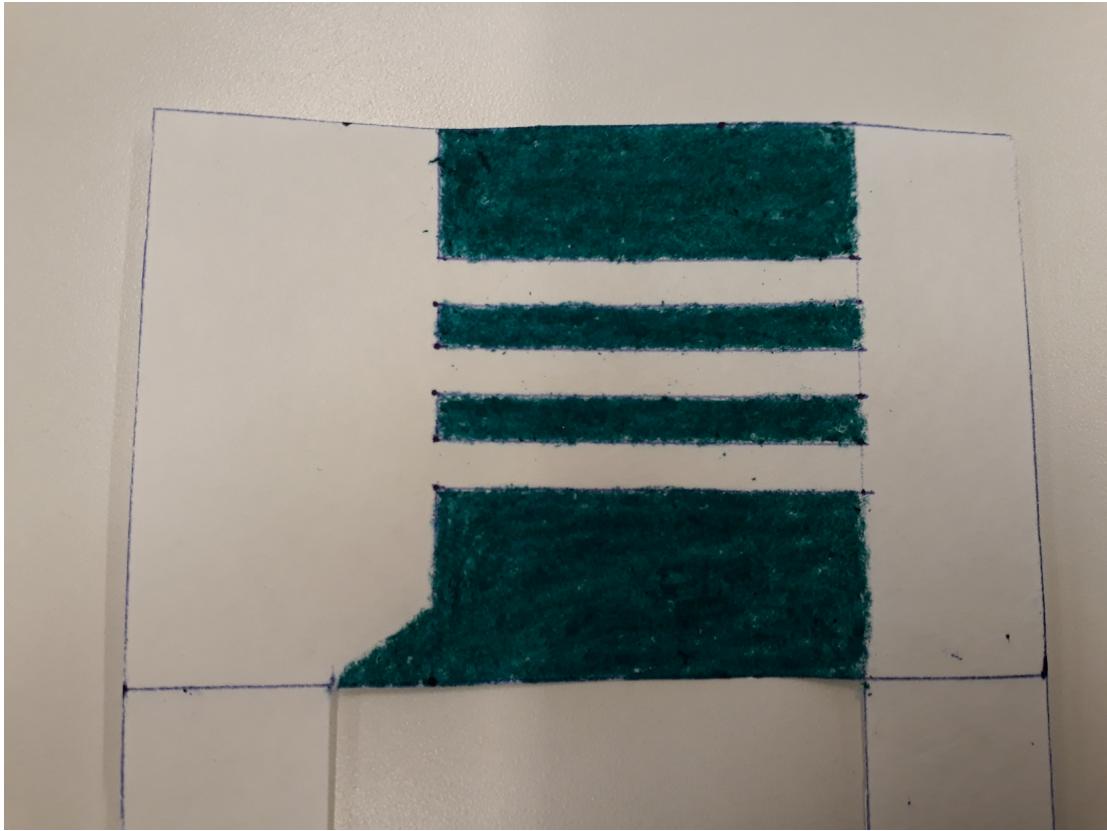




### Channel Formation

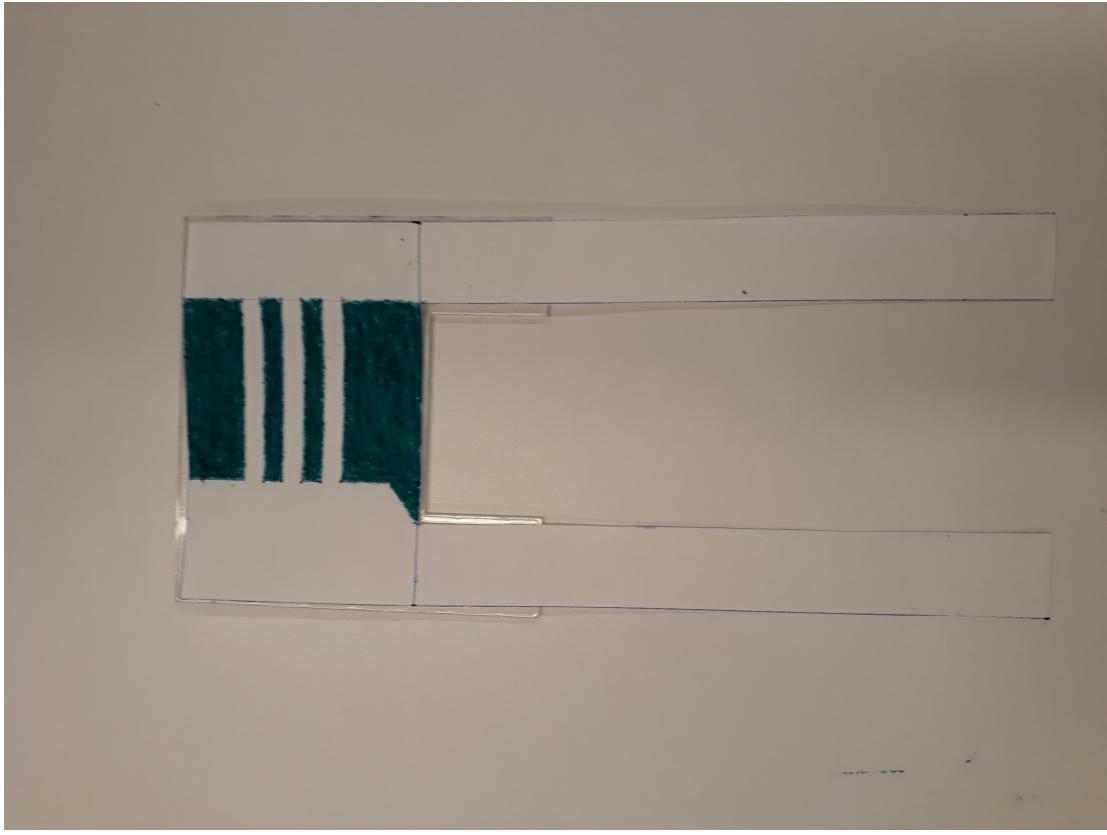
- 4 Melt the wax, we use a regular oven at 100 °C for 140s. Remove it from the heat and let the wax solidify. It must cross the paper.

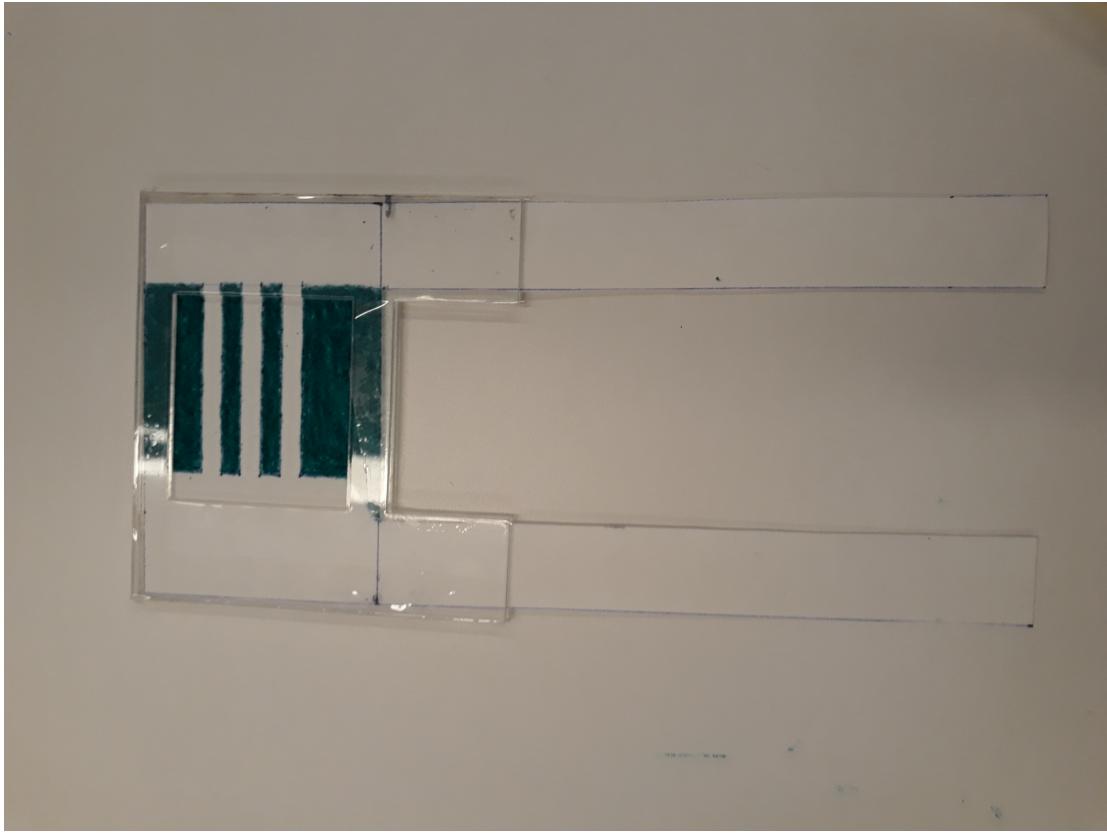
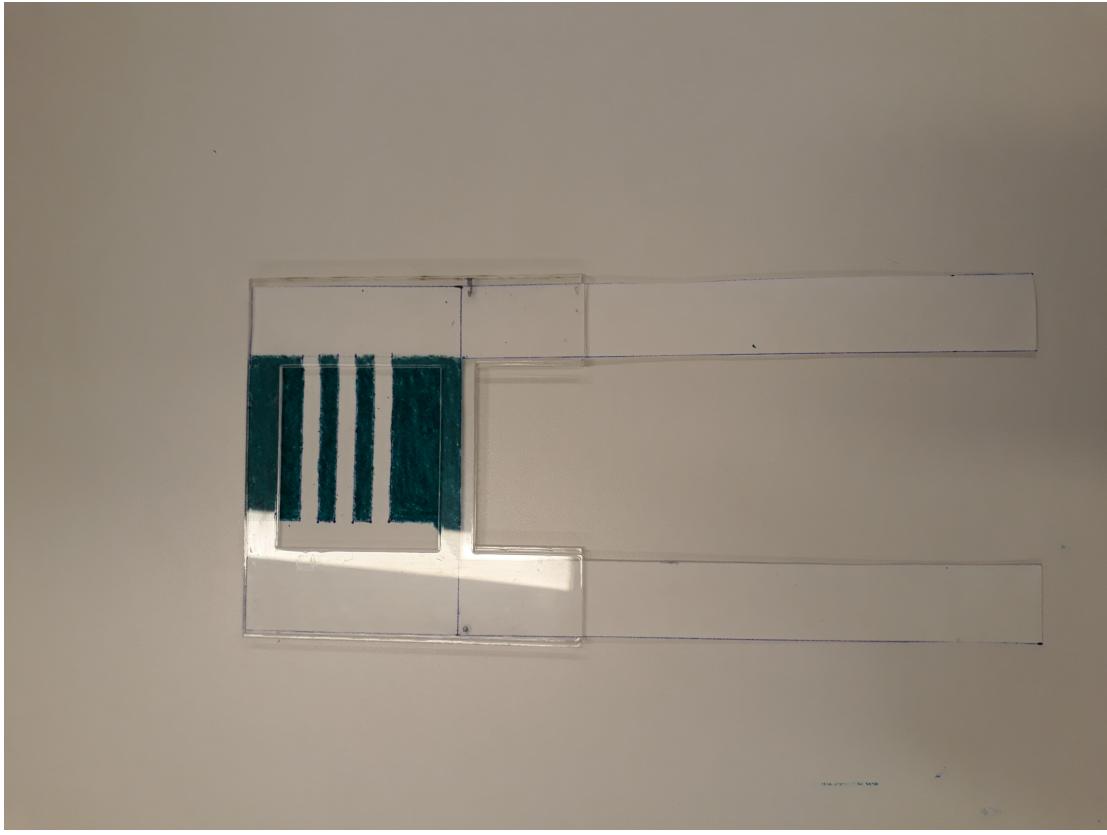




### Acrylic paper sandwich

- 5 Put the paper in between the acrylic sheets. You can put some tape to make it more impermeable.



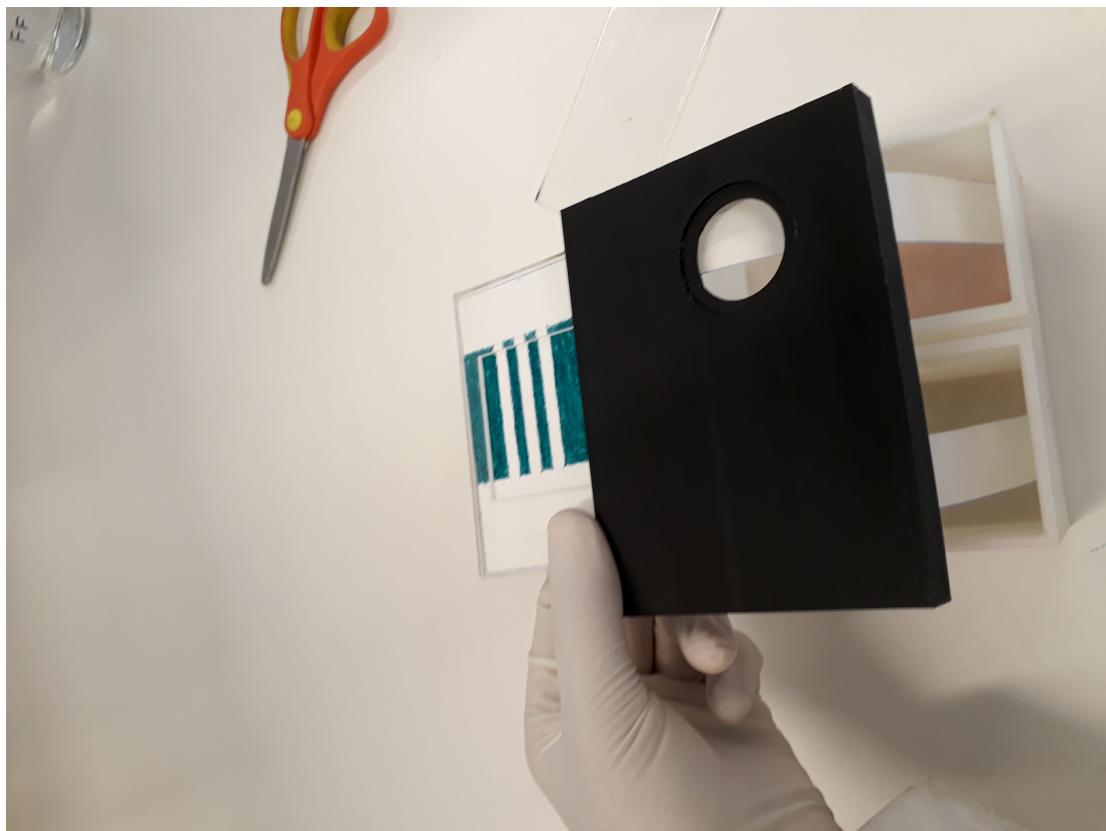


### Device Assemble

Put the acrylic paper sandwich in the lid of the hardware.



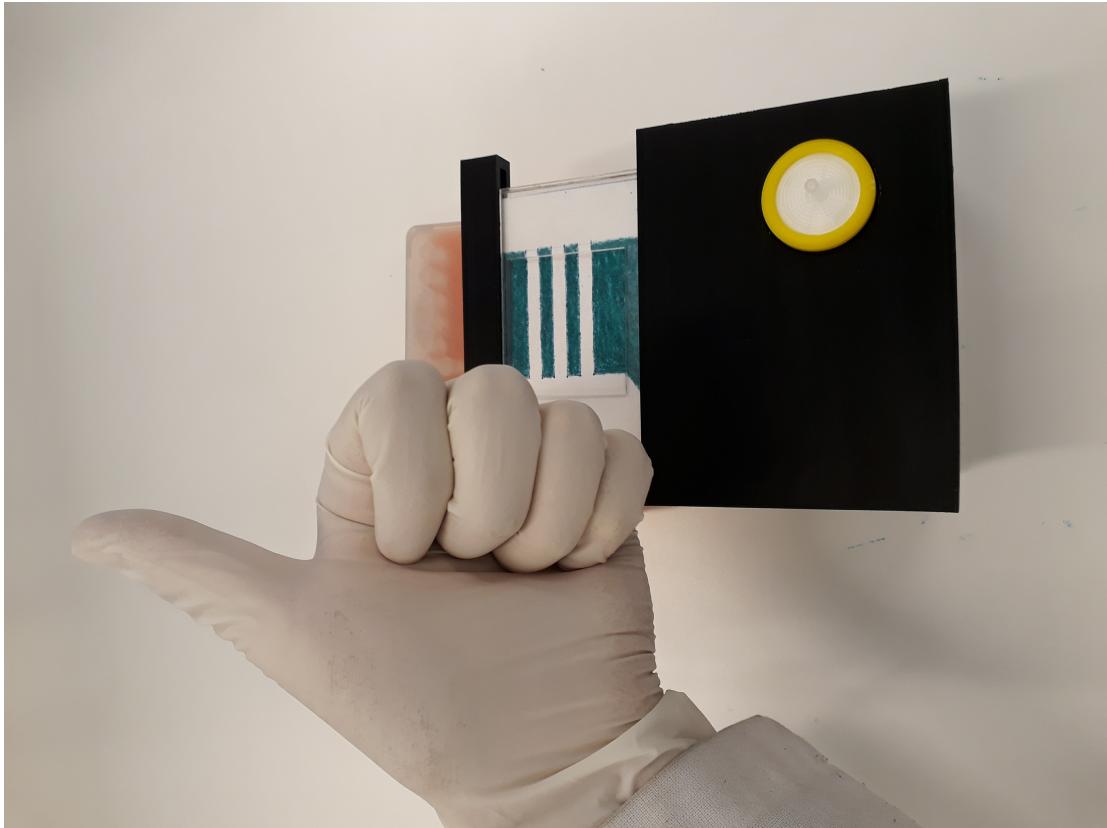
- 7 Introduce the paper ends in the Source and close the device. You can use a tip box as pint of support.





- 8 Insert the paper acrylic sandwich in the clip to keep pressure in it and put the filter. Now you are ready to do experiments.





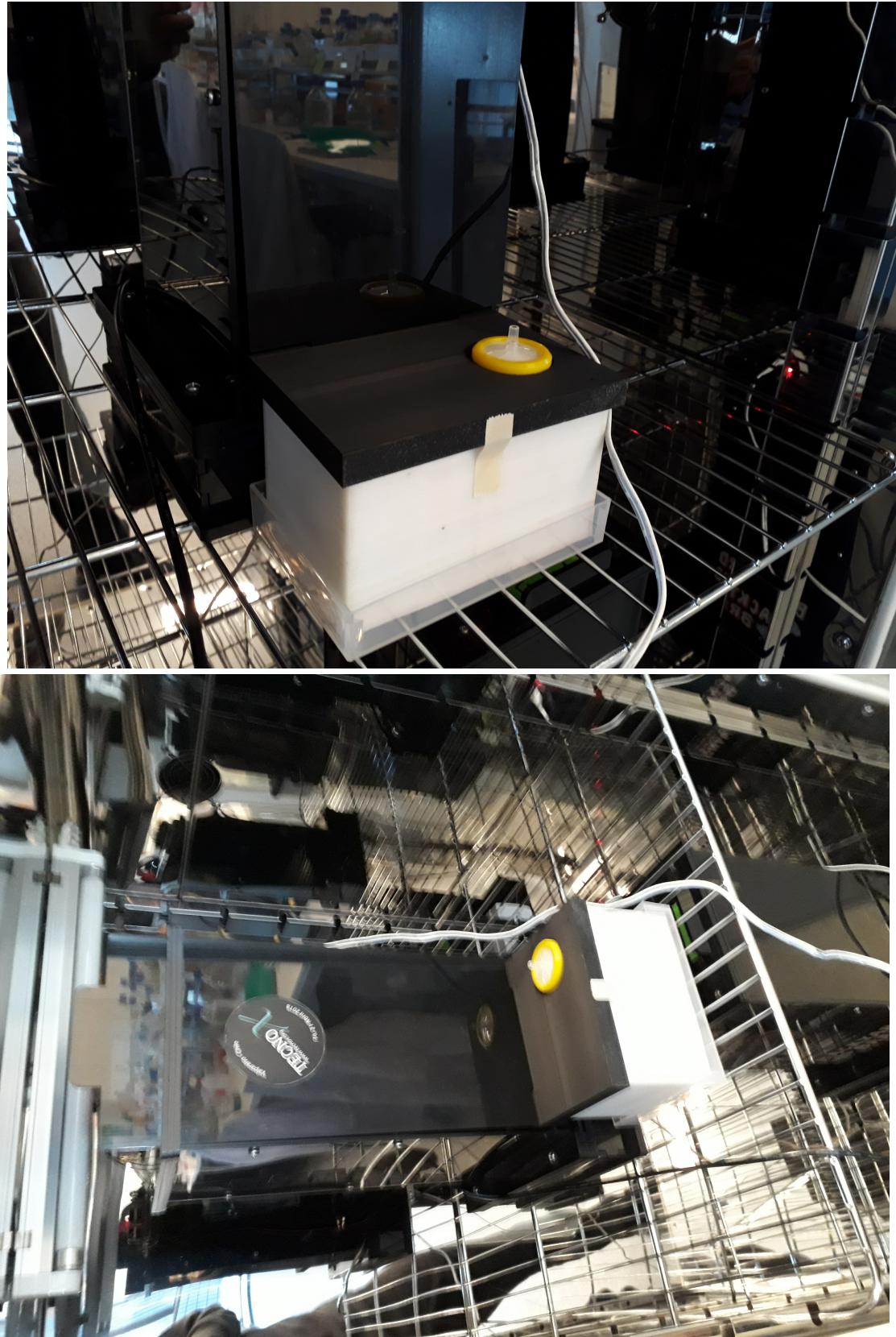
#### Experiment workflow

- 9 Put your favorite bacteria direct in the channels or you can use paper discs previously cultured with bacteria.

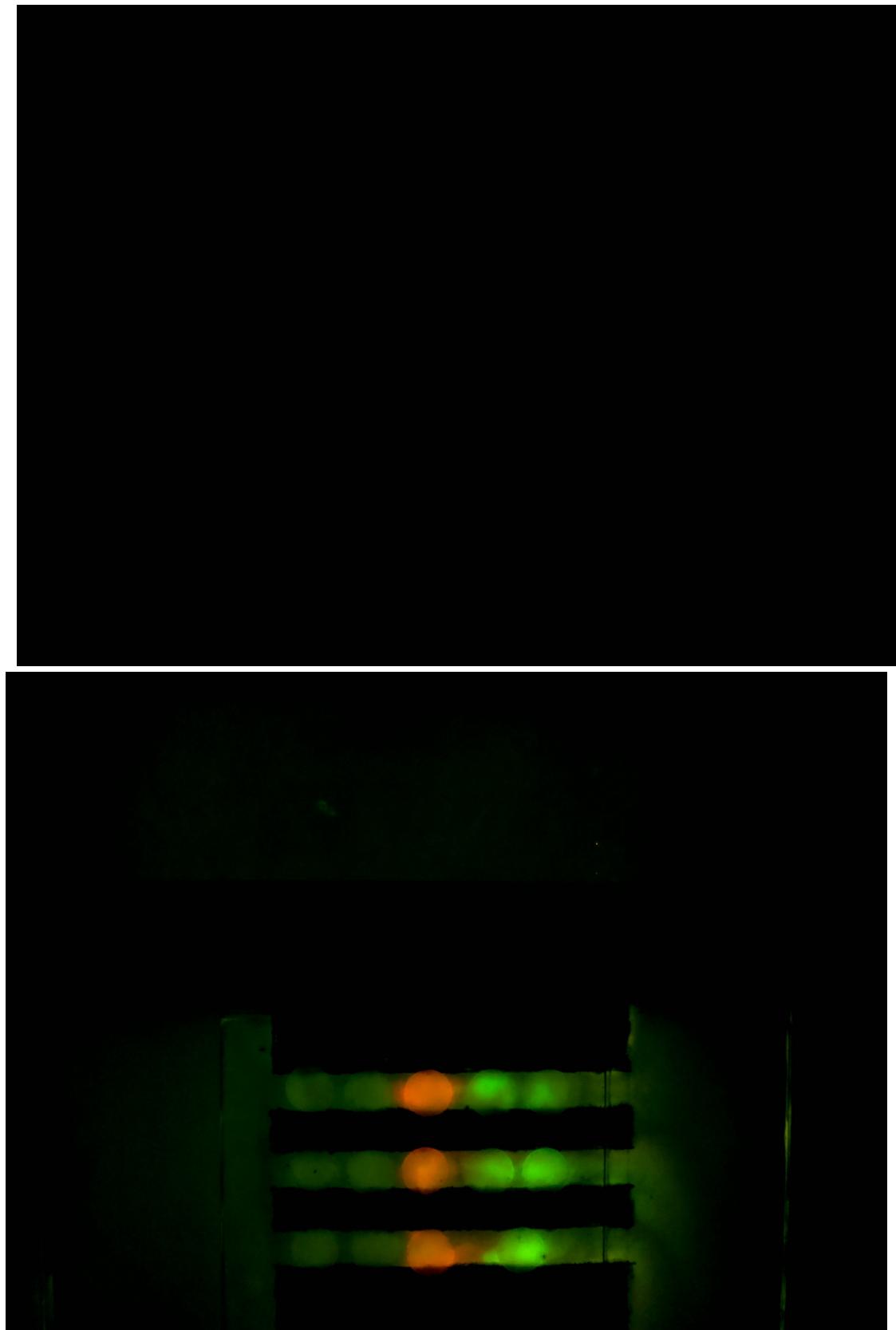


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Set your experiment. In this case we introduce the device in an incubator and get results with FluoPi a Low-Cost and Open-Acces transiluminator. Fabricate your own FluoPi <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0187163>



Get Results.



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