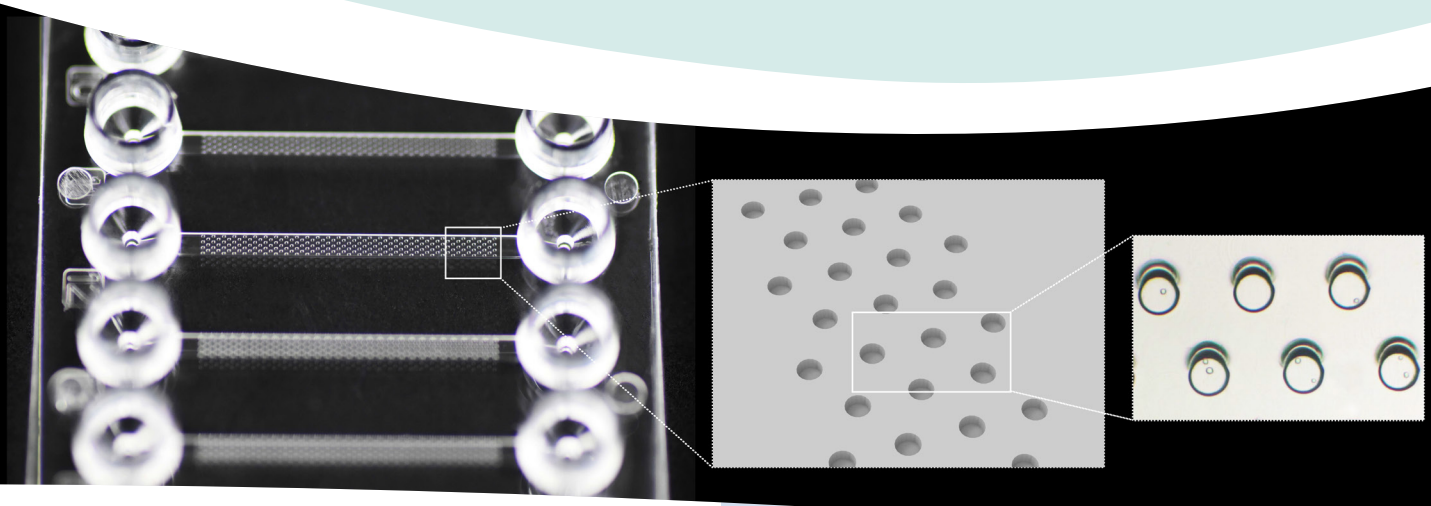


Handling Instructions - Cell trap chip Fluidic 913

Monitor single cells on a microfluidic chip

In life sciences, the analysis of cells and their communication with each other plays a key role.
The isolation of single cells can be particularly helpful in this context.

The cell trap chip Fl. 913 was developed to facilitate the analysis of individual cells and particles. The cells are collected in wells of different sizes, where they can be monitored directly.

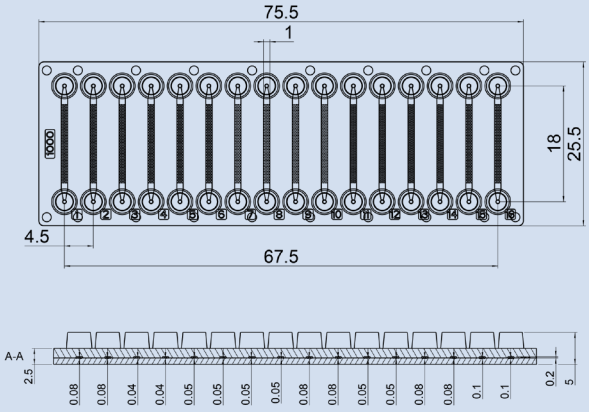
For example, this chip is ideal for studying the interaction between different cell types by monitoring protein markers with fluorescence staining.

Chip description

The cell trap chip Fluidic 913 has 16 individual channels with small wells on the bottom. It consists of a top side, which forms the chamber geometry and where the fluidic interfaces are located and a bottom side where the wells are. The well geometries of the chambers differ in depth, diameter and distance (pitch) to each other, as shown in the table below. The well-containing channels themselves features a width of 1000 µm and a height of 200 µm.

Key features of the cell trap chip are:

- Slide format: 75.5 x 25.5 x 5 mm
- 16 individual channels
- Channel width: 1000 µm
- Channel height: 200 µm
- Cell trapping wells in each channel
- Well geometries of the chamber differ in depth, diameter and distance (pitch) to each other



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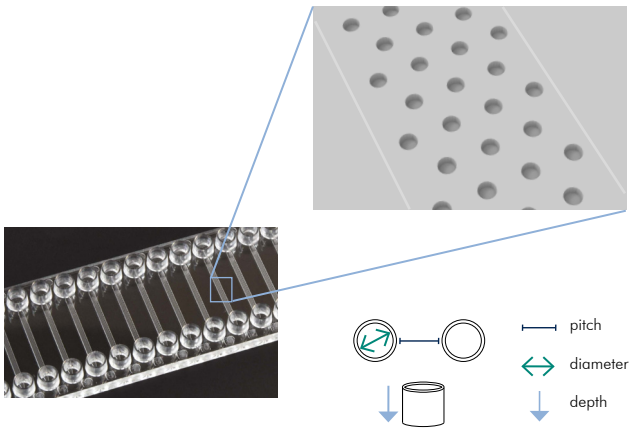
Handling Instructions Fluidic 913

Data of the well geometry per cavity

Channel	Diameter [µm]	Depth [µm]	Pitch [µm]	Number of wells
1+2	100	100	250	200
3+4	100	75	250	200
5+6	100	50	250	200
7+8	75	75	250	200
9+10	75	50	250	200
11+12	50	50	200	319
13+14	50	40	200	319
15+16	100	75	250	200

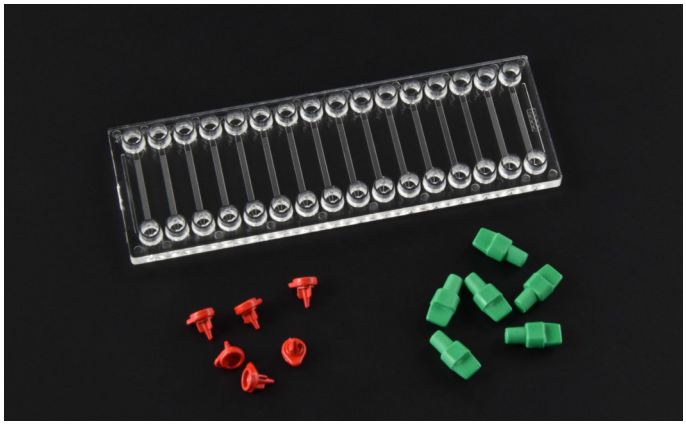


Necessary equipment

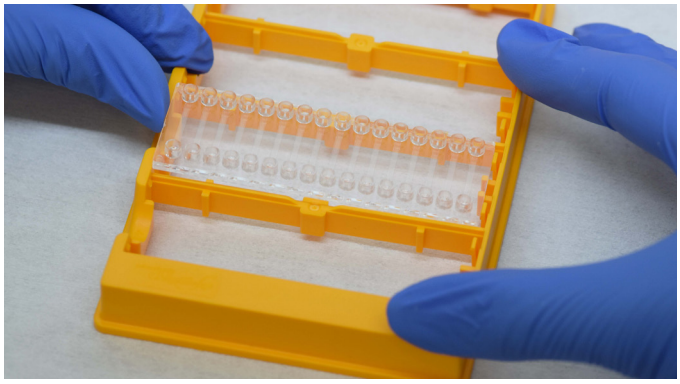
- Cell trap chip Fluidic 913
- Male Mini Luer plugs

Optional:

- Mini Luer to pipette adapter
- Handling frame
- Silicon sleeve (cut from silicone tube)
- PTFE tubing
- Pump system of your choice
- Male Mini Luer Fluid connectors



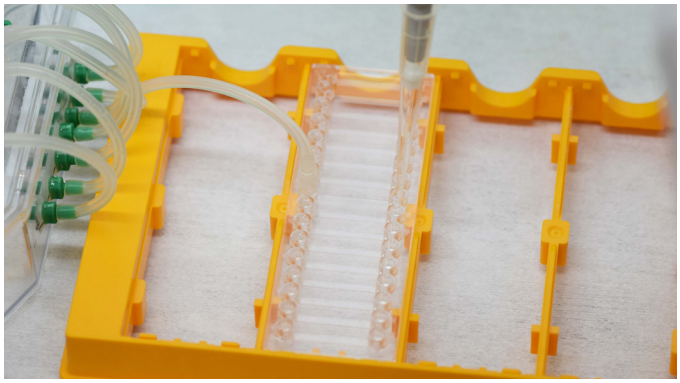
Assemble setup



- Place chip in the handling frame
- Prepare your cell suspension with your specific concentration

Prepare chip

- Pretreat the channels by flushing them with 70 % ethanol, this prevents air bubbles and additionally disinfects the channels
- Flush the channels with cell culture media to remove ethanol



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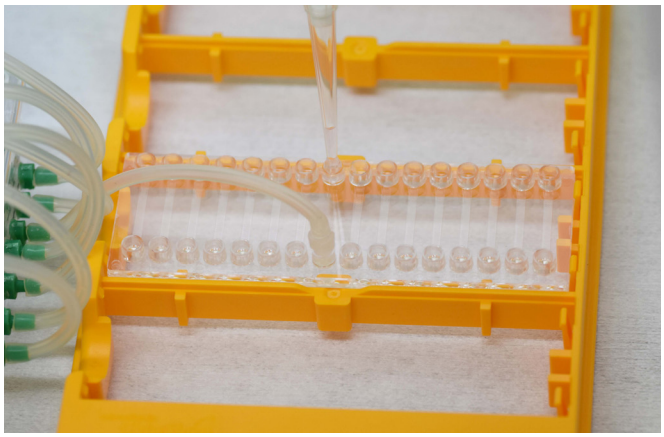
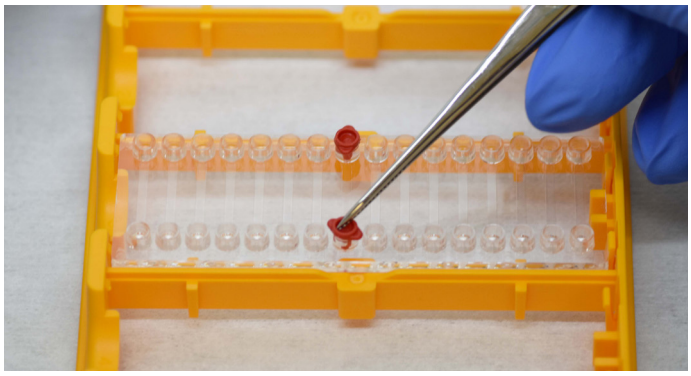
Handling Instructions Fluidic 913

Step 1 - Cell seeding

- Fill the pipette with cell suspension
- The pipette tip should be filled with at least the volume of the chamber (approx. 5 µl)
- Pipette the cell suspension into the inlet of the chamber by holding the tip as straight as possible and touching the channel inlet with the tip
- Alternatively use a pipette adapter
- Fill the chamber until the media is visible on the outlet



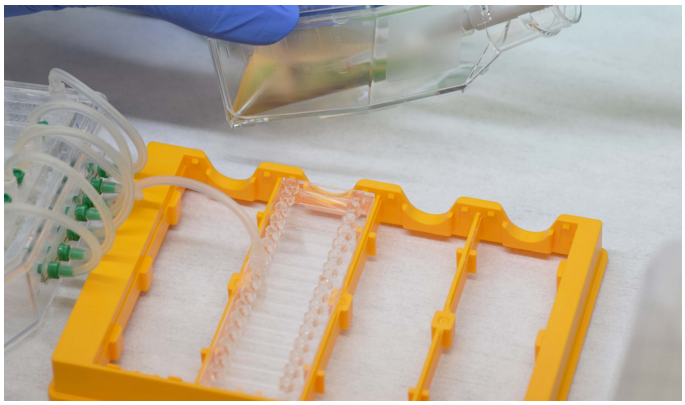
Step 2 - Closing the interfaces and incubation of the cells



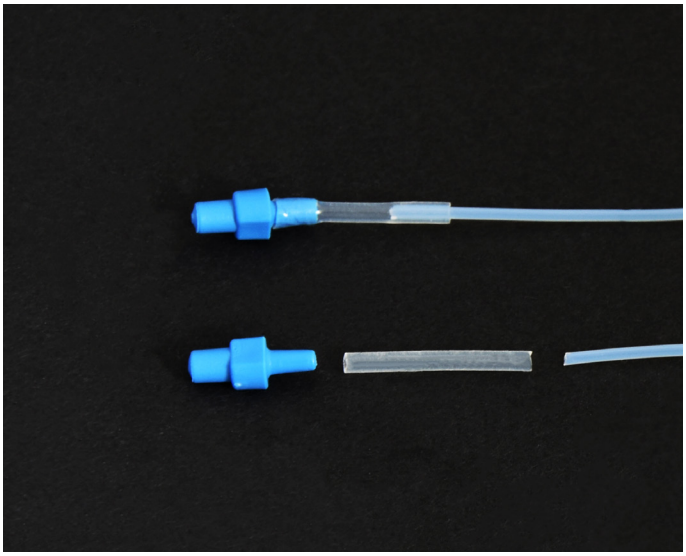
- Close the in- and outlets with low volume displacement plugs
- Press the plugs firmly into the interface by hand or with tweezers
- Allow the cells to settle down into the wells for at least 3 hours, depending on the cell type. Incubate the chip under cell culture conditions.

Step 3 - Medium exchange or cell seeding

- After the cells have settled, the medium can be exchanged or a second cell type can be seeded
- Remove the plugs from the interfaces of the chambers
- Fill a pipette tip with your cell suspension or media
- Place the tip straight in the inlet
- Gently release the cell suspension or media in the chamber
- Close the interfaces with plugs
- Incubate the chip under cell culture conditions



Step 4 - Medium exchange, staining or microscopic observation



- For medium exchange and staining, proceed as described in step 3
- Microscopic observations are performed by using an inverted microscope

Pump controlled handling:

- For cell seeding proceed as described in step 1-3
- Unplug the interfaces
- Attach the tubing to male Mini Luer fluid connectors
- Insert the connectors into the inlet and outlet of the chamber
- Connect a pump with pulsation free flow to the tubes
- Start the pump with your intended flow rates

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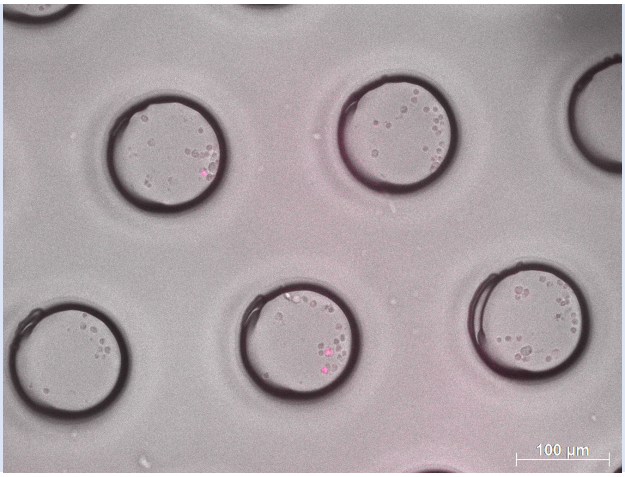
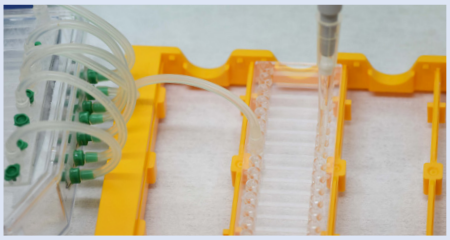
Application example:

The cell trap chip was used to analyze communication between cells. Single peripheral blood mononuclear cells (PBMCs) were trapped and stimulated with anti-CD3 & anti-CD28. After incubation, the cytokine IFNy was stained with fluorescent markers (red).

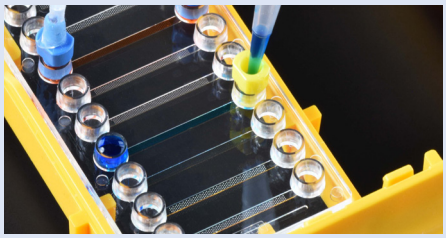


Hacks for handling cell trap chip Fluidic 913

It is crucial to remove all air from the chamber and the wells before trapping the cells. Avoid air in the chamber and channels by following these tips:



Before starting your experiment, flush the chambers with ethanol and media to remove air from the wells.



For easier pipetting use the Mini Luer to pipette adapter. This helps preventing the formation of air bubbles in the channels.

Use low volume displacement plugs to avoid air or liquid displacement. Fill the inlet interface with media before placing the plug.

Product Code for Fluidic 913	Description	Material	Surface Treatment	Price [€/chip]		
				1+	10+	100+
10001799	Cell trap chip	Zeonor	-	69.20	44.40	39.80

Product Code	Description of Accessories	Material	Quantity	Price [€]		
				1+	5+	10+
10000116	Male Mini Luer fluid connector	TPE - Opaque	10 pcs / pack	19.00	14.00	9.40
10000205	Male Mini Luer plugs – Low volume displacement	TPE - Red	10 pcs / pack	19.00	14.00	9.40
10000057	Mini Luer to pipette adapter	PP - Yellow	10 pcs / pack	19.00		9.40
10000031	Silicone tube, ID: 0.76 mm, OD: 1.65 mm	Silicone	1 m	9.50	-	-
10000032	Micro tubes, PTFE, ID: 0.5 mm, OD:1.0 mm	PTFE	1 m	9.50	-	-
10000043	Handling frame with high skirt, orange	PC	1pc	22.00	15.00	12.40

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