iBiochips

Protocol for 1CellArray-Glass Bottom

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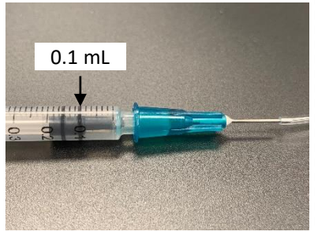
Cell Preparation

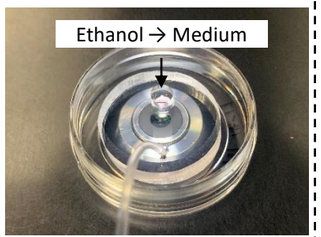
Prepare cell suspension with a concentration of ≥10^7 cells/mL into a cell culture medium. A higher concentration of cell suspension is helpful to obtain a relatively higher efficiency for single-cell capture.

Generation of -P



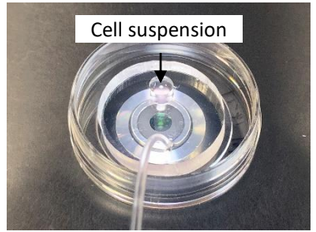
Draw the syringe plunger to the scale of 0.1 mL to generate a 100 µL of negative pressure (-P). Later, the -P will guide liquids and cells to flow from the Inlet Well to the microchannels and the Outlet Well.

Air Removal



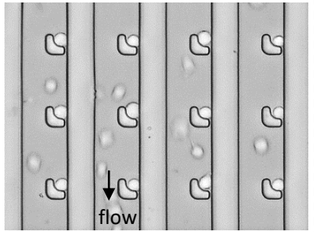
Add 25 µL of 70% ethanol into the Inlet Well to prime microchannels. Once all air is removed, use 50 µL of the cell culture medium to wash the Inlet Well 3-5 times to remove the residual ethanol.

Cell Suspension Adding



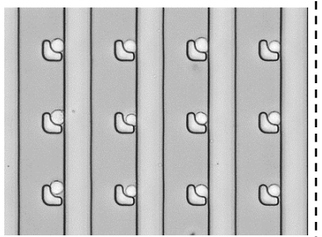
Use a pipette to remove all the cell culture medium from the Inlet Well and then rapidly add 25-50 µL of cell suspension into the Inlet Well. Fully suspend the cells before adding them to the Inlet Well.

Single-Cell Array



Check the cell flowing under a microscope until target single-cell capture is achieved. If cells stop flowing, a little bit –P (such as 10 µL) could be applied. Too much –P may take air into microchannels.

Single-Cell Imaging



Wash uncaptured cells and add 70 µL of the medium into Inlet Well to prevent backflow. The #1.5 coverslip glass bottom (~0.17 mm thickness) is compatible with DIC, TIRF, FRET, confocal microscopy, and widefield fluorescence.

Applications

- Single-Cell Array
- Single-Cell Capture
- Single-Cell Perfusion
- Single-Cell Imaging with DIC, TIRF, FRET, confocal microscopy, and widefield fluorescence

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