

## The basic experiment

To validate the effectiveness of fluid manipulation using artificial cilia, we will design and set up a **basic experiment**.

The final test will consist of fluid flow characterization in an elementary micro-fluidic device containing the micro-actuators or artificial cilia, as conceptually sketched in Figure 1. It consists of a micro-fluidic channel device in which the artificial cilia are integrated. By magnetically or electrically actuating the artificial cilia, fluid flow should be generated. The flow will be characterized using special flow velocity measurement techniques such as micro-PIV (Particle Image Velocimetry).

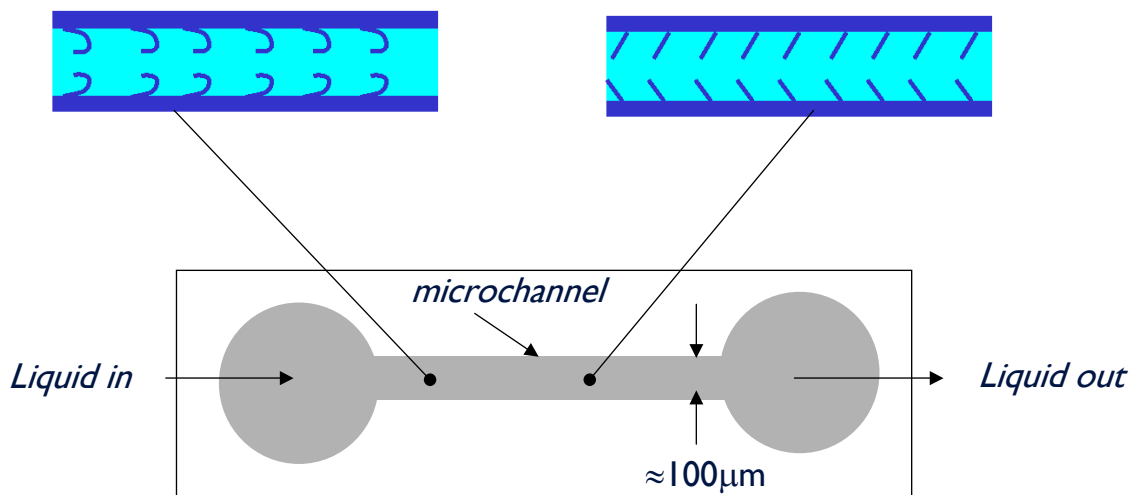


Figure 1: Sketch of the principle of the micro-fluidic test structure. Artificial cilia are integrated within a micro-channel, creating a flow through actuation by a magnetic or electrical field. The drawings are not to scale: the artificial cilia have a length of approximately  $10\mu\text{m}$  in a channel having a width of  $100\mu\text{m}$ .