

# Study of Fluid Interfaces in Microfluidics.

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We study the interface fluid-air of water and some viscous fluids such as ethylenglicol and glycerol inside microchannels of different height and width. We have used two methods to observe this interface. The first method consists on injecting the fluid inside the microchannel at a constant flow rate of the order of microliters per minute using an injection pump. Once the fluid enters the microchannel we measure the velocity of the fluid front and we compare it with the injection rate. In the second method we observe the fluid interface using a constant pressure exerted by a liquid column submitted to atmospheric pressure. To accomplish this, we fix different heights and for each we measure the velocity at which the front of fluid is moving. We repeat this treatment to different positions from the entrance of the fluid to the

microchannel. Then our measurements of the velocity inside the microchannel are compared using the Darcy Law in order to obtain a relation with the fluids viscosities. With this method we have observed that for heights over the 2.5 cm between the column and the microchannel the velocity of the fluid behaves as constant. We have performed measurements with blood plasma and blood at 5% and 10% of hematocrit and in this case we observed that the fluid properties generate effects at the channel walls which are very different to those with water and ethylenglicol.

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