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## PhD Research Activities

October 2014

### Medium sized molecules clearance through artificial kidneys

Let's start with the title of my work. It is "Middle molecules clearance through artificial kidneys" and it deals with the filtration of small proteins (i.e. b-2 microglobuline) through a membrane (artificial kidney).

#### CONTEXT

One of the remaining imperfections of hemodialysis is the protein deposition on the surface of membrane, which leads to the deterioration of purification properties of dialysis module. The great majority of studies related to this phenomena performed up to now was conducted at macro level, which means that the results of fouling were observed for the entire module, without insights of what is happening in its different regions or at the scale of the isolated fiber.

#### AIM of PhD

The aim of my work is to **develop an optimal strategy to control the transfer of medium-size molecules during blood purification procedure**. In order to reach the target we are trying to develop the transparent microchip, which may be used as housing for hemodialysis membrane. This approach will enable direct observation of filtration process through the membrane. The permeation and adsorption of fluorescence labeled molecules would be followed by means of fluorescent microscopy. By coupling of microchip technology with fluorescent microscopy it will be possible to make a real time observations of filtration process at local scale, which will provide new insights in dialysis membranes fouling caused by protein adsorption.