

Convection-diffusion in microfluidic biochips

Kasper W. Lipsø, Søren Vedel and Henrik Bruus

Department of Micro- and Nanotechnology, Technical University of Denmark

ProCell is a newly developed platform for on-chip handling of biological cells with a real-time feedback loop for bio-chemical control. The diffusion through channels and membranes in the ProCell chip is investigated. A theoretic review of the system exposes relevant aspects of diffusion through a membrane. 1D models are fitted to experimental data, and a more realistic 2D model is presented to yield higher degree of consistency. Contamination between adjacent channels is shown to have impact on the system, and the magnitude of the contamination flux is estimated.