# Squeezing multiple soft particles into a constriction : transition to clogging

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We extend previous works dealing with squeezing a single isolated capsule into a constriction to the case of multiple deformable capsules. This situation is largely encountered in microfluidic chips designed to manipulate living cells, which are soft entities. We use fully three-dimensional simulations based on the lattice Boltzmann method to compute the flow of the suspending fluid, and on the immersed boundary method to achieve fluid-structure interaction. The mechanics of the capsule membrane is computed with the finite element method. We have obtained two main states : continuous passage of the particles, and their blockage that leads to clogging the constriction. The transition from one state to another is dictated by the ratio between the size of the capsules and the constriction width, and by the capsule deformability. This latter is found to enhance particle passage through narrower constrictions, where rigid particles with similar diameter could not cross.