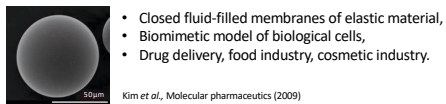
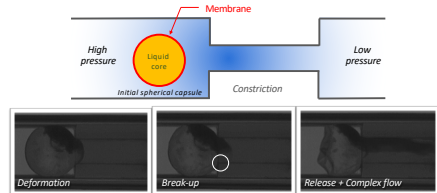


Problem

Squeezing capsules into a constriction

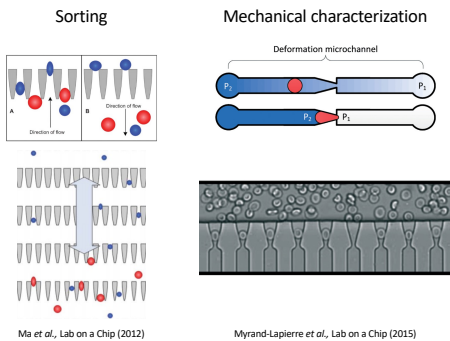


- Closed fluid-filled membranes of elastic material,
- Biomimetic model of biological cells,
- Drug delivery, food industry, cosmetic industry.



Le Goff, Kaoui et al., Soft Matter (2017)

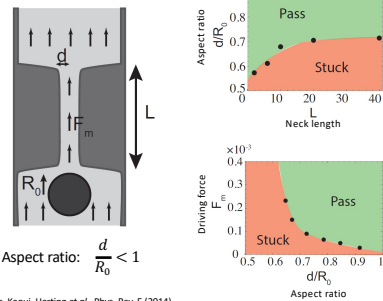
Applications



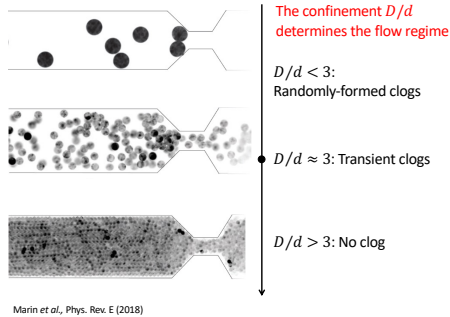
Drawback: clogs formation

Previous studies

Flow of a single soft particle through a constriction



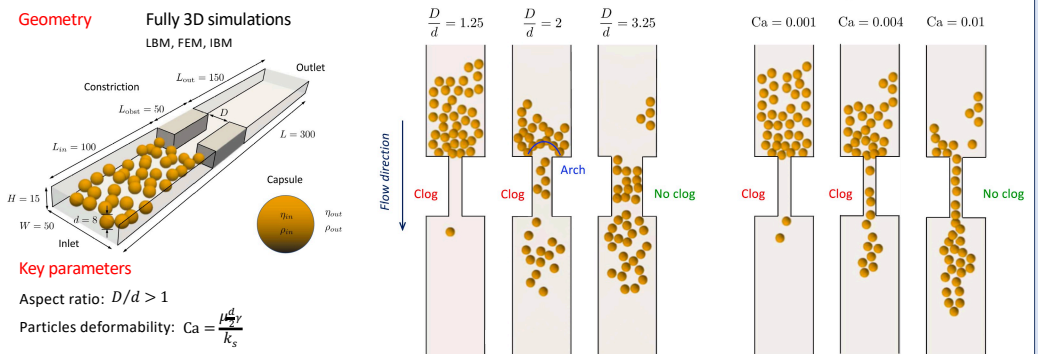
Flow of multiple rigid particles through a constriction



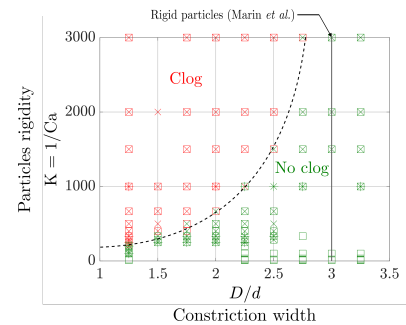
A single deformable particle or multiple rigid particles

Present study

Flow of multiple soft particles through a constriction

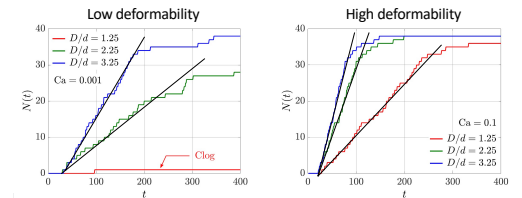


States diagram

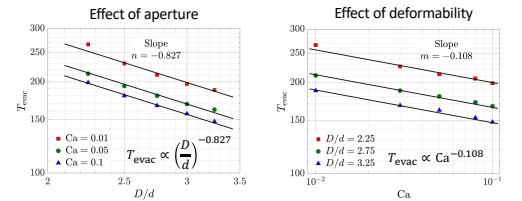


The deformability character of the particles drops down the threshold of the transition to no-clog state below the value measured experimentally for rigid particles.

Dynamics of particles passage through the constriction



Evacuation times needed for all the particles to pass through the constriction



Conclusions

- This study considers multiple deformable particles, and thus, complements already existing studies dealing with either a single deformable particle, or multiple rigid particles,
- Both the effects of confinement and particles deformability on the transition to clogging are investigated and reported in a states diagram,
- The evacuation time decreases nonlinearly when increasing the aperture and the particles deformability,
- The effect of the number of particles and channel geometry are left for future works.

Acknowledgments

