Measuring surface tension of Giant Vesicles (Sébastien Harlepp, IPCMS)

In the early 1970th, bio-physicists developed experimental[1] and theoretical models[2,3] addressing questions linked to membrane bending energies as well as to their visco-elastic properties. From Laplace law it is easy to link the vesicle surface tension to the difference of pressure. The studied vesicles have an average diameter of roughly 20µm, and the goal will be to exert a local depression to its surface. In that optic, we will design a micropipette with a diameter around 5µm linked to an external system able to apply pressure. The exerted depression will deform the vesicle and this deformation allows us to access the vesicle surface tension.

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2. Deuling, H. J. & Helfrich, W. Red blood cell shapes as explained on the basis of curvature elasticity. *Biophysical Journal* **16,** 861 (1976).
3. Helfrich, W. Elastic properties of lipid bilayers: theory and possible experiments. *Z Naturforsch C* **28,** 693–703 (1973).