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Stretching cells and delivering drugs with bubbles[1] CLAUS-DIETER OHL, FENFANG LI, CHAN CHON U, YU GAO, CHENJIE XU, Nanyang Technological University — In this talk we'll review our work on impulsive cell stretching using cavitation bubbles and magnetic microbubbles for drug delivery. For sufficient short times cells can sustain a much larger areal strain than the yield strain obtained from quasi-static stretching. Experiments with red blood cells show that even then the rupture of the cell is slow process; it is caused by diffusive swelling rather than mechanical violation of the plasma membrane. In the second part we'll discuss bubbles coated with magnetic and drug loaded particles. These bubbles offer an interesting vector for on demand delivery of drugs using mild ultrasound and magnetic fields. We report on basic experiments in microfluidic channels revealing the release of the agent during bubble oscillations and first *in vivo* validation with a mouse tumor model.

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