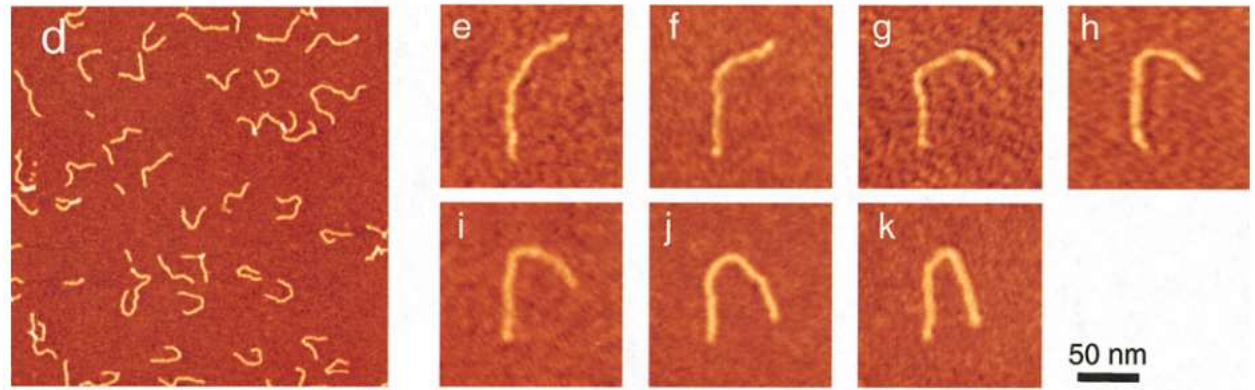
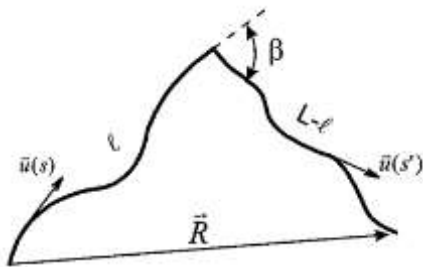
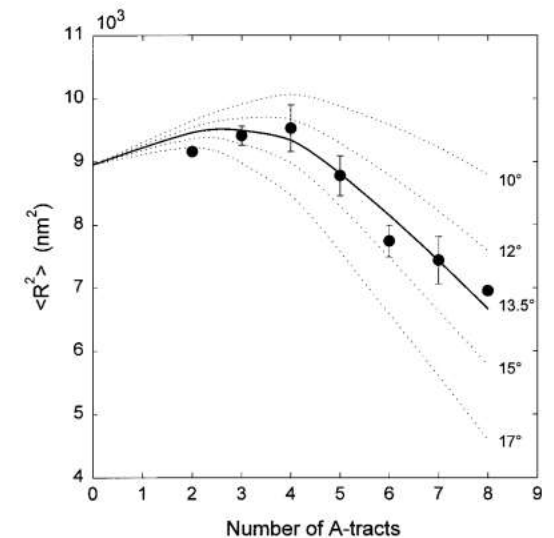
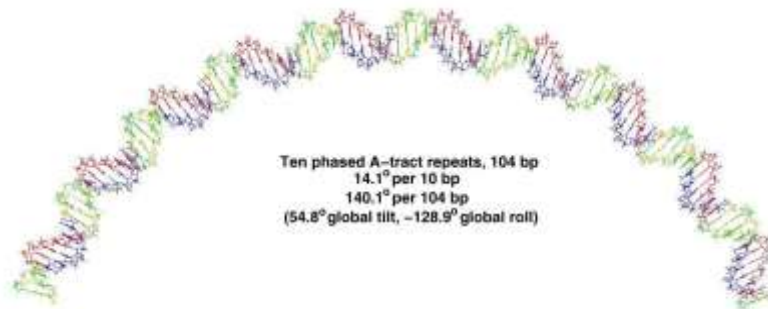


WLC with Bends: DNA with A-tracts

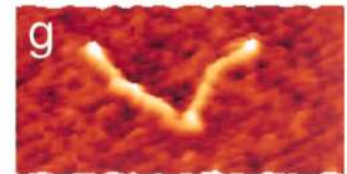
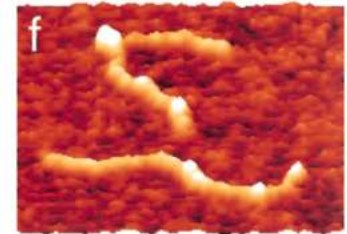
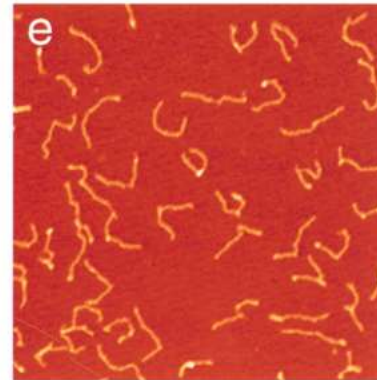
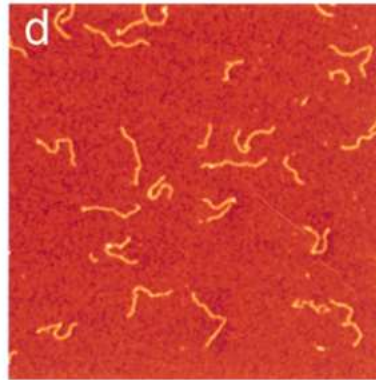
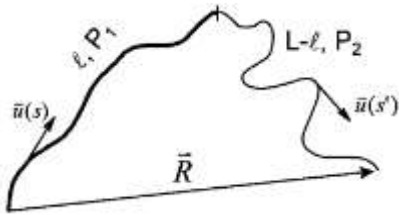


Rivetti *et al.* J. Mol. Biol. **280** (1998)

Bend of $\sim 14^\circ$ per “A-tract” = 4–6 adenine base pairs
(not Korean boyband)

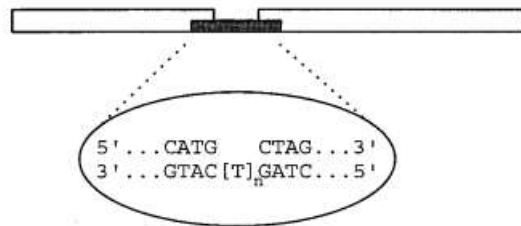


WLC with Sections of Different Flexibility

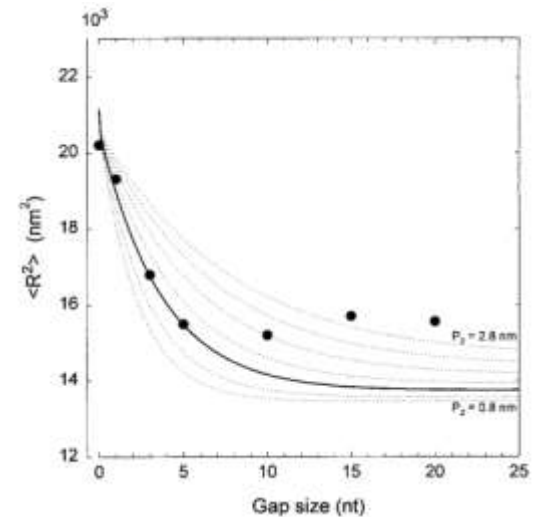


250 nm

50 nm

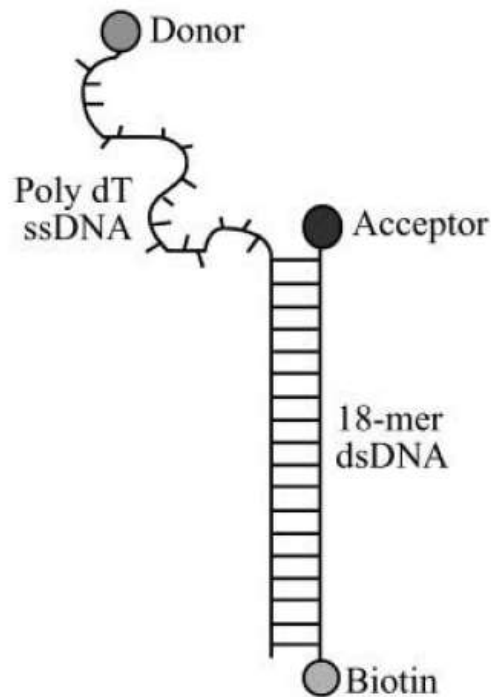


Sections of ssDNA with
 $P = 1-3$ nm (and 0.6 nm/bp)

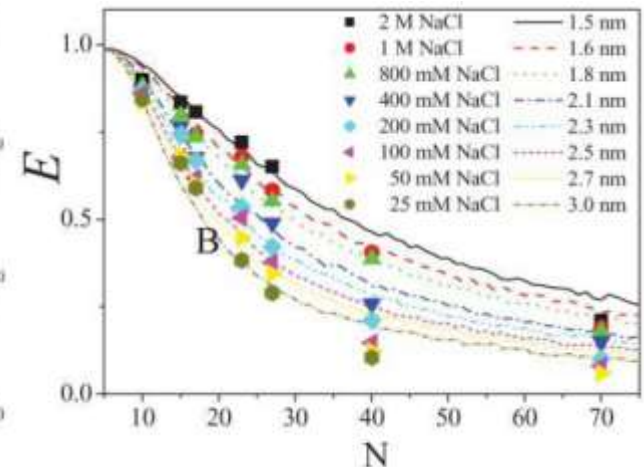
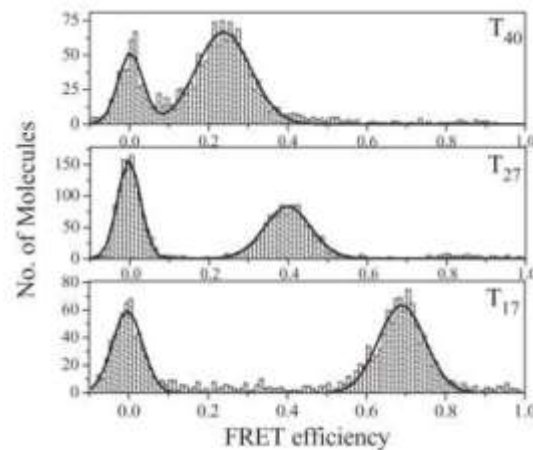


Probing Single-Stranded DNA Using FRET

(Förster Resonance Energy Transfer)



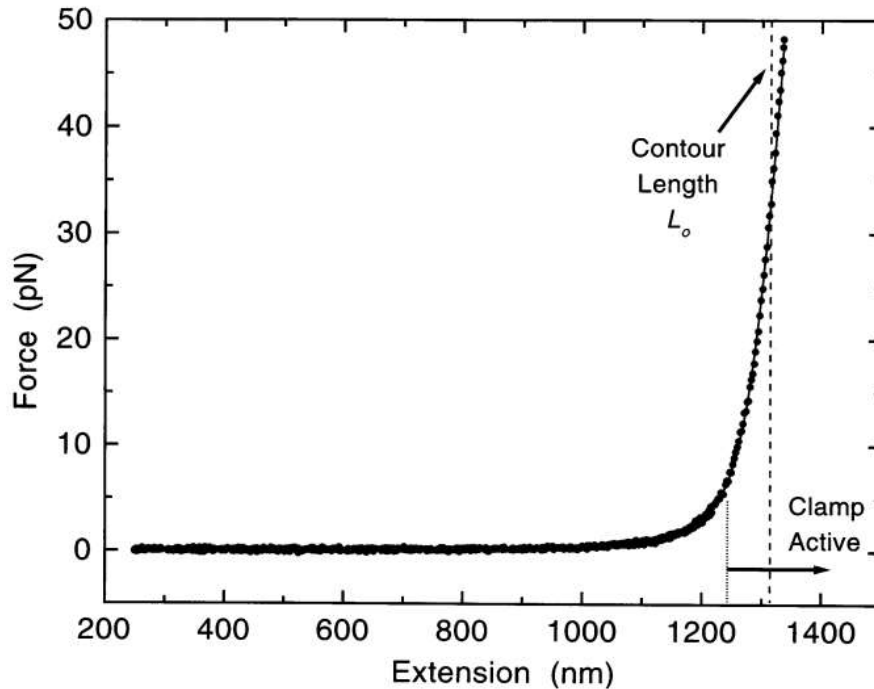
FRET efficiency: $E = 1 / \{1 + (R/R_0)^6\}$



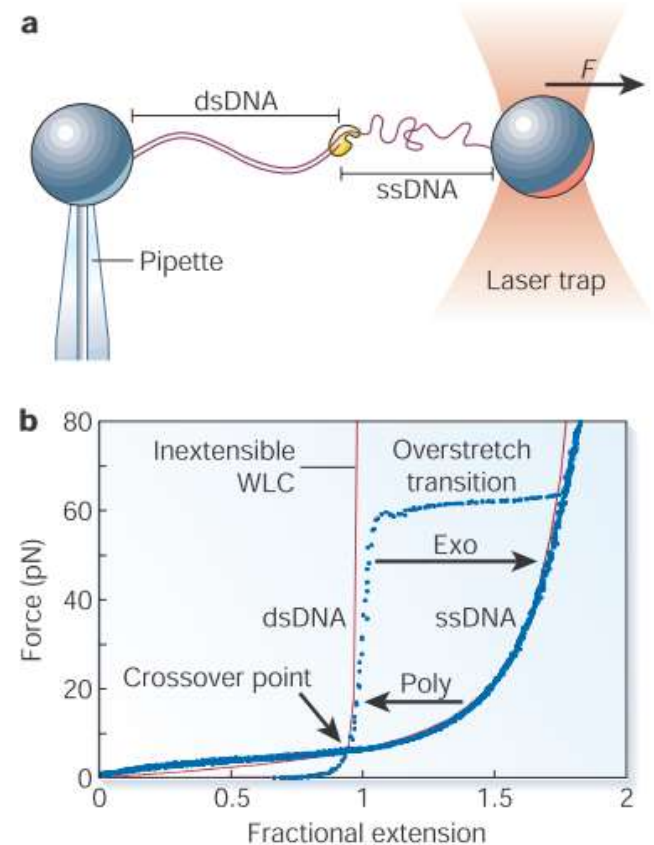
Murphy *et al.* Biophys. J. **86** (2004)

Chen *et al.* PNAS **109** (2012)

Extensible WLC: Overstretched DNA

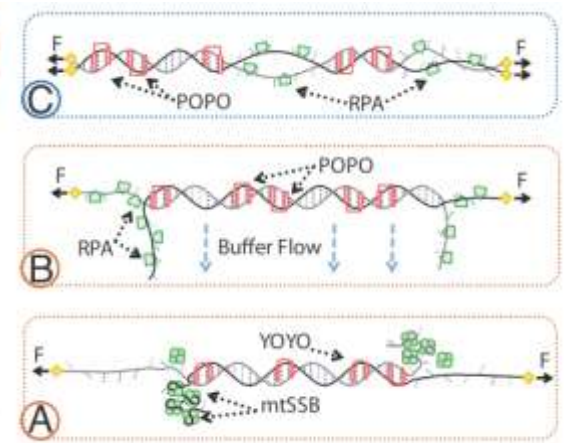
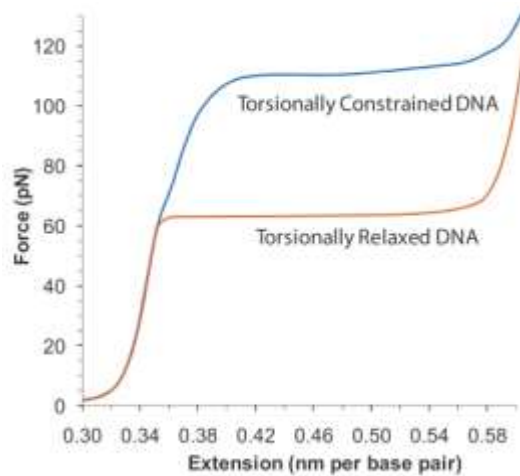
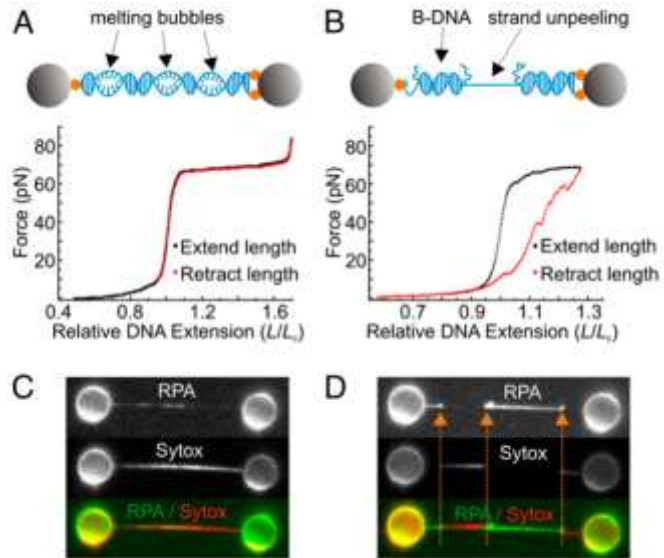


Wang *et al.* Biophys. J. **72** (1997)



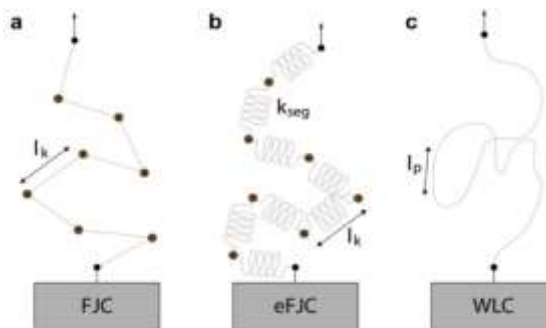
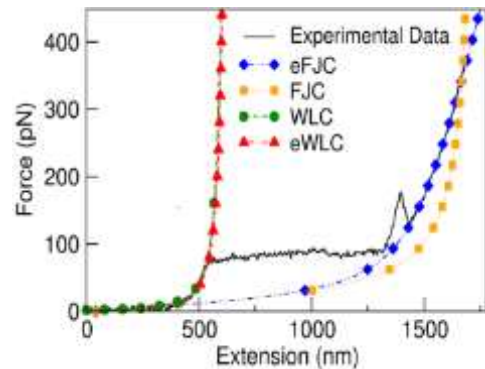
Bustamante *et al.* Nature **421** (2000)

Overstretching and “Melting” DNA



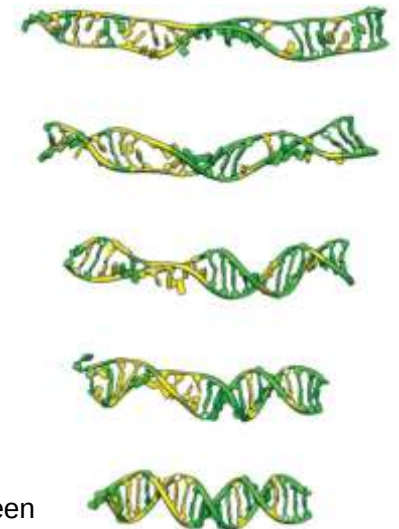
Williams *et al.* PNAS **106** (2009)

King *et al.* PNAS **110** (2013)



Guo *et al.* Cell & Bioscience **3** (2013)

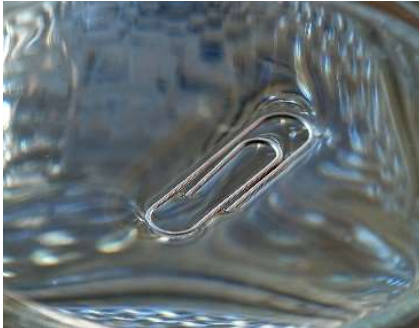
Li *et al.* Nanomaterials **5** (2015)



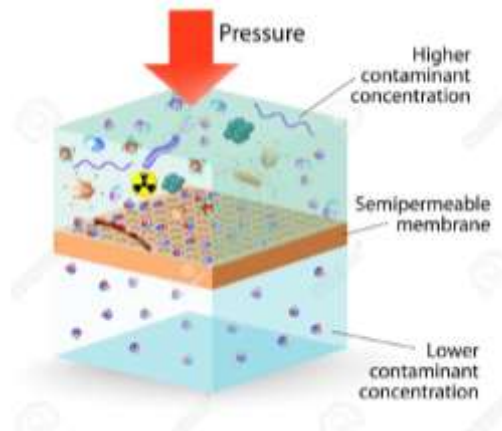
AT yellow; CG green

Bongini *et al.* J. R. Soc. Interface **11** (2014)

Membrane Physics



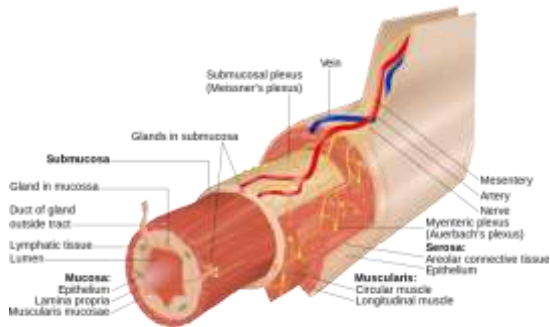
https://commons.wikimedia.org/wiki/Surface_tension



<http://previews.123rf.com>

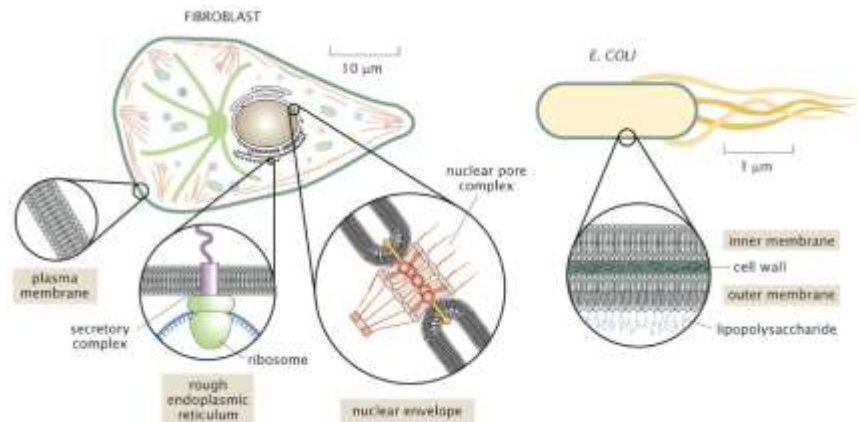
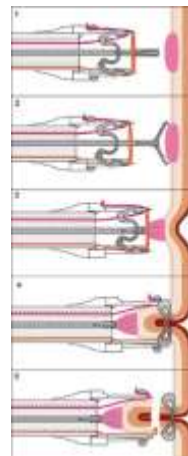


<https://en.wikipedia.org/wiki/Tent#/media/File:CircusTent02.jpg>



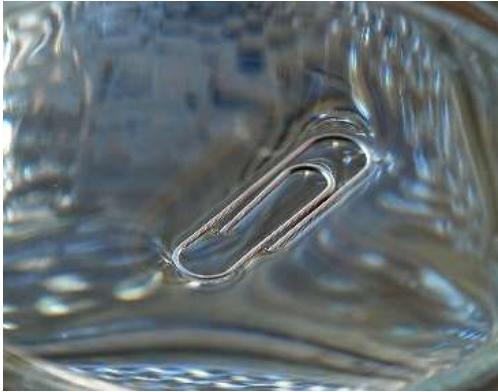
https://commons.wikimedia.org/wiki/File:2402_Layers_of_the_Gastrointestinal_Tract.jpg

Endoscopic Colonic Resection
 Ovesco Endoscopy AG, Tübingen
<https://ovesco.com>
 sebastian.schostek@ovesco.com



http://microsite.garlandscience.com/pboc2/resources/jpegs/figures/ch11/ch11/figure_11_02.jpg

Surface Tension & Young-Laplace-Equation

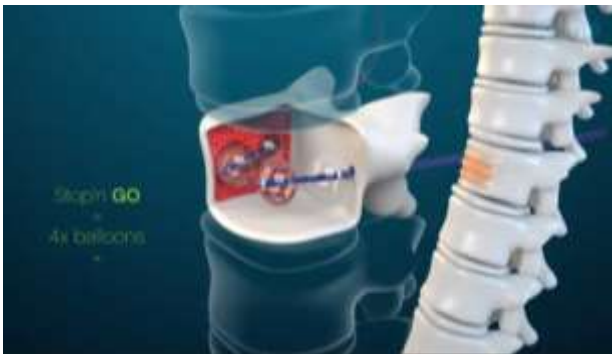


https://commons.wikimedia.org/wiki/Surface_tension



<http://www.bastelstunde.de/wp-content/uploads/2015/03/Seifenblase.jpg>

“Balloons” for minimal invasive treatment of vertebral compression fractures:



<https://www.joline.de>

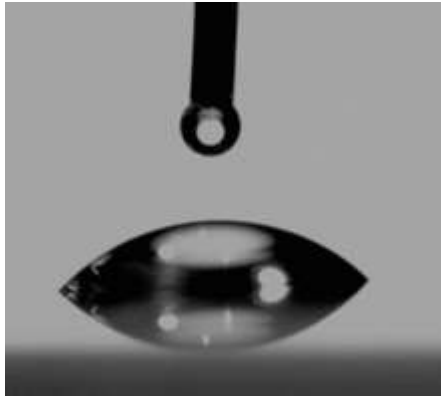
JOLINE GmbH & Co. KG, Hechingen
michael.eisenlohr@joline.de



<https://www.youtube.com/watch?v=GqgTNxfb1AU>

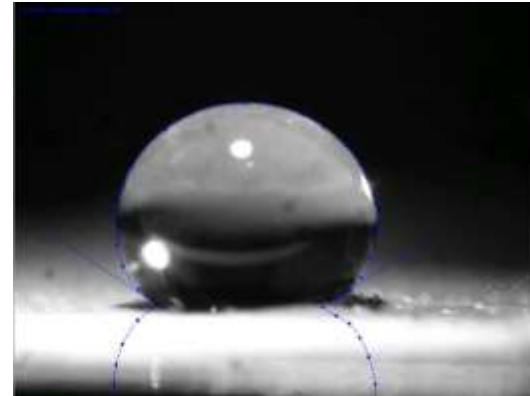
Contact Angle

Water on glass



https://upload.wikimedia.org/wikipedia/en/d/d3/Video_contact_angle.gif

Water on lotus leaf



https://en.wikipedia.org/wiki/Contact_angle#/media/File:DropConnectionAngel.jpg

Self-cleaning “Lotus” effect



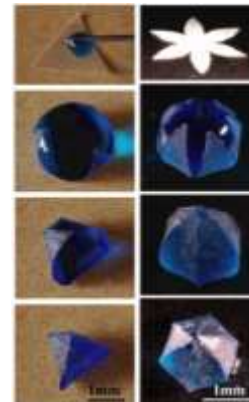
Ross Nanotechnology's NeverWet
<https://www.youtube.com/watch?v=7is6r6zXFDc>

Heart-Lung machine membrane



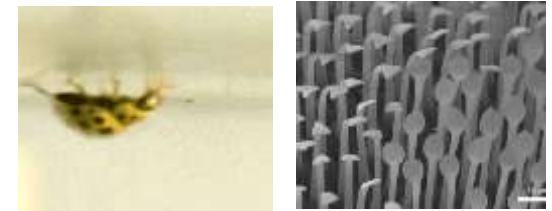
Paven *et al.*
Nat. Comm. **4** (2013)
DOI: 10.1038/ncomms3512

Capillary 'origami'



Roman & Bico J. Phys.: Condens. Matter **22** (2010)
DOI: 10.1088/0953-8984/22/49/493101

Setae of insects



<http://labos.ulg.ac.be/microfluidics/current-research/biomimetic-capillary-adhesion/>

Gernay *et al.* J. R. Soc. Interface **13** (2016)
DOI: 10.1098/rsif.2016.0371

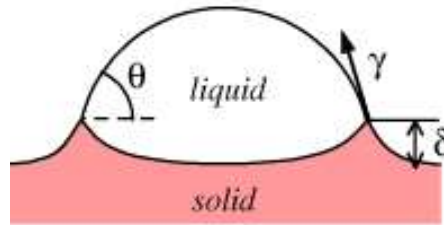
Contact Angle

Elasto-capillarity:

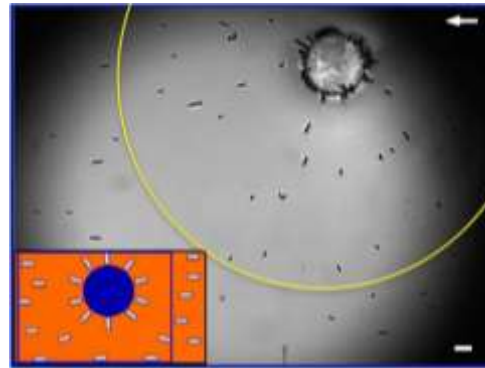
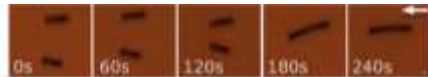
Water on soft elastomer



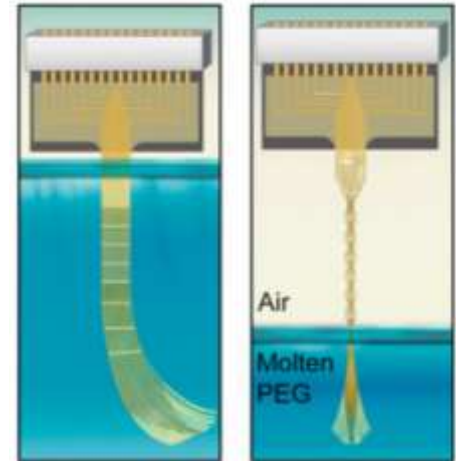
https://en.wikipedia.org/wiki/Elasto-capillarity#/media/File:Deformed_PDMS_by_droplet.jpg



Elastocapillary assembly of cylindrical micro particles



Elastocapillary self-assembled sensor for neural activity recordings



Guan *et al.* Sci. Adv. **5** (2019)
DOI: 10.1126/sciadv.aav2842

Liu *et al.* PNAS **112** (2015)
DOI: 10.1073/pnas.1504817112

Nice reviews:

More physical: Style *et al.* Annu. Rev. Condens. Matter Phys. 8 (2017), DOI: 10.1146/annurev-conmatphys-031016-025326

More applications: Bico *et al.* Annu. Rev. Fluid Mech. 50 (2018), DOI: 10.1146/annurev-fluid-122316-050130