BE 159 Winter 2016
Homework #5
Due at the start of class, March 7, 2016

Problem 1 (Adhesion and tension by looking)**.**
Several times in class we talked about how careful thinking ahead of experimentation can open doors for new inquiries. A key component of that paper was the analysis of the force balances of doublet and triplet geometries of cells. In this problem, you will work through that exercise. Derive equation 1 of the Maître, et al. paper. *Hint*: It may be useful to recall the formulas for the surface area and volume of a spherical cap. Imagine was have a sphere of radius R. We then slice off a spherical cap. If we put the spherical cap on a table, its height is h. The surface area and volume of the cap are respectively

$$A_{\text{cap}} = 2\pi Rh, \tag{1}$$

$$V_{\text{cap}} = \frac{\pi h^2}{3}(3R - h). \tag{2}$$