

Homework 1

- 1) If *E.coli* is a capsule shaped ellipsoid that is roughly 2 μm on the long axis and 1 μm along the short axis, estimate its surface area and volume. Express this volume in femtoliters.
- 2) Roughly 2-3kg of bacteria are in your intestine. Estimate the total number of bacteria that this corresponds to. Estimate the total number of human cells in your body and compare the two figures.
- 3) Estimates claim that in the top 200m of the world's oceans, there are roughly 10^{28} prokaryotes. Work out the total volume take up by the cells in m^3 and km^3 . Compute their mean spacing. How many cells are there in a mL of ocean?