5. Interval Estimation for Means and Proportions

Task 1. Work with *pancreatitis* data. The data can be taken either from Moodle (see Session 5) or from http://edu.sablab.net/biostat/data/pancreatitis.txt

a) Define 95% confidence interval for the proportion of the never-smoking people coming to a hospital.

b) Calculate interval estimation for 90 and 99% confidence.

c) How many patients should you check to decrease the proportion error down to 0.01?

Task 2. Work with *mice* data. The data can be taken either from Moodle or from http://edu.sablab.net/biostat/data/mice.txt

a) Calculate the interval estimation for the mean "Bleeding time" (conf 95%).

b) Does "Bleeding time" data contain any outlier? If so, remove them and repeat the analysis to increase robustness.

Task 3. Work with *mice* data.

a) Calculate the interval estimation for the "Ending weight" (conf 95%) separately for male and female for all data set. Which statistics will you use?

b) Calculate interval estimation for the "Ending weight" (conf 95%) separately for male and female for "129S1/SvImJ" mouse strain. Which statistics will you use?

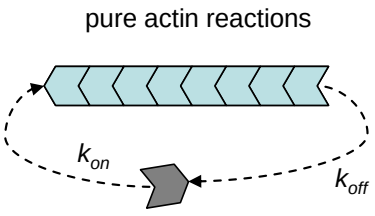
Task 4. Work with *mice* data.

a) Calculate the proportion of the mice with *Weight change* bigger than 1.2 independently for male and female population. Provide interval estimation.

b) Provide interval estimation for the blood pH for "129S1/SvImJ" strain.

c) To obtain precision (standard error) in pH < 0.01, how many blood samples would you need.

Task 5. Consider actin polymerization process. The average rate of monomeric actin (M-actin) binding to filament k_{on}, as determined in 4 independent experiments, was 10 $\mu M^{-1}s^{-1}$ with the standard deviation of the experimental values ~2 $\mu M^{-1}s^{-1}$. Observed rate of dissociation from filament k_{off} was approximately 1 s^{-1} (standard deviation is 0.2 s^{-1}). The steady-state concentration of M-actin (so called critical concentration) can be predicted by equation $C_{crit} = k_{off}/k_{on}$



Calculate the 95% confidence interval for the critical concentration of M-actin.