# BIOS 8500: Monte Carlo and Bootstrapping

- Bootstrapping
  - Mouse medians
  - Hypothesis testing (again)
- Jackknife

# Bootstrapping

General idea:

Given a sample of N subjects:

Draw B samples of N using sampling with replacement.
(resample the sample)

Compute the statistic of interest from each of the B samples

Can then find standard error of the statistic, do the hypothesis test, compute the confidence intervals, etc. using the empirical sampling distribution

## Example 1: Mouse survival

(from Efron & Tibshirani, 1993)

Survival times (in days) recorded for two groups of mice: those subjected to a test surgery (n=7) and controls (m=9).

Treated (n=7): 94, 38, 23, 197, 99, 16, 141

Controls (m = 9): 52, 10, 40, 104, 50, 27, 146, 31, 46

median(treated) = 94

median(control) = 46