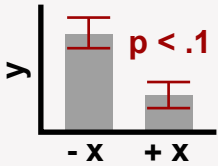


idea

Data Analysis:

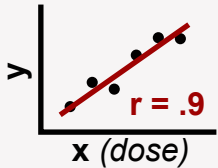
infer similarities or differences

Significance Testing



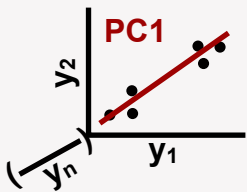
Is there a difference?

Correlation / Co-variation Testing



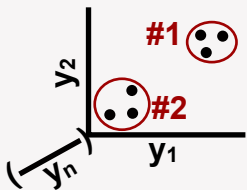
Are these differences related?

Component / Factor Analysis



How many factors underly differences in n-measurements?

Cluster / Discriminant Analysis



How many groups can be identified in n-measurements?

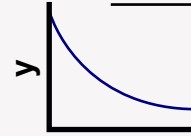
1-D DATA

N-D DATA

Hypothesis/Modeling:

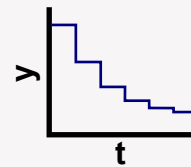
predict behavior from properties

Deterministic Models: ensembles



$$y = e^{-k \cdot t}$$

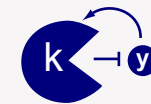
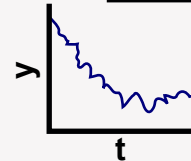
analytical:
general soln



$$\Delta y = -k \cdot t \cdot \Delta t$$

numerical:
case-specific

Stochastic Models: single molecule



accounts for randomness, noise

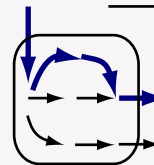
Bayesian Network Analysis



$$p(D|S^1) = \frac{p(D)p(S^1|D)}{p(S^1)}$$

" $p(D|S^1)$ " =
probability(p) of
hypothesis(D)
given data(S^1)

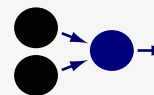
Stoichiometric Network Models



$$\frac{d\vec{C}}{dt} = \begin{bmatrix} \text{stoichiometry} \end{bmatrix} \text{rates}$$

pathway flux analysis

Boolean Network Models



on-off regulatory analysis

experiment