Statistics 516

Statistical Design and Analysis of Gene Expression Experiments

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- Office Hours: Monday and Wednesday from 10:00-10:50 and other times by appointment

STAT 516

- This course introduces technologies used to measure gene messenger RNA levels.
- Currently, the most commonly used technologies are microarray technology and next-generation sequencing technology.

STAT 516

- Although we will spend some time learning about these technologies, the main focus of the course is on a variety of statistical techniques useful for the design and analysis of gene expression experiments.
- Such experiments are useful for understanding the functions of genes and have become common in biological and biomedical research.

Students completing STAT 516 should

- be able to provide expert advice on the design of experiments that measure gene expression,
- perform appropriate analyses in collaboration with biological researchers,
- be ready to consider research problems in the statistical design and analysis of gene expression experiments,
- gain a sound understanding of the statistical principles important for good design and analysis of experiments that involve thousands of response variables.

Computing

- We will use R extensively throughout the course.
- Students are expected to be familiar with R.
- We may also use SAS occasionally.

No Required Textbook

- Notes posted prior to class.
- *Cartoon Guide to Genetics* by Larry Gonick and Mark Wheelis provides a basic introduction to the biology behind gene expression experiments
- I have no book recommendations for the statistics of gene expression experiments.

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Grading in Statistics 516

- 25% homework
- 25% midterm exam
- 15% project (written & oral presentation)
- 35% final exam

See syllabus for more detail.

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