Statistics 416

Statistical Design and Analysis of
Microarray Experiments

1/12/2009

1

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- 239C Kildee Hall

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

2

About Statistics 416

- Statistics 416 is for graduate students outside of statistics interested in learning how to use statistical methods to design and analyze microarray experiments.

- Statistics 401 is a prerequisite for Statistics 416.

- Statistics 416 is a statistics course rather than a biology or technology course.

- However, we will necessarily spend time discussion the technology in order to better understand design and analysis issues.

3

About Statistics 416

- Course content heavily influenced by my interactions with ISU faculty, students, and staff engaged in microarray experimentation.

- We will focus on statistical methods for identifying differentially expressed genes and perhaps briefly touch upon other uses of microarray technology.

- We will study design of experiments that use microarray slides rather than design of the slides themselves.

4

Students completing STAT 416 should

- gain a sound understanding of the statistical principles important for good microarray experimental design and analysis,

- be able to design and analyze their own microarray experiments,

- become comfortable using the R statistical computing environment, and

- be able to offer an informed critique of the statistical aspects of microarray experimentation and analysis described in scientific research papers.

5

Computing

- We will use R (http://www.r-project.org/) extensively throughout the course.

- Students are expected to become familiar with the R statistical computing environment.

- R is free and may be downloaded at http://streaming.stat.iastate.edu/CRAN/

- We may also use SAS occasionally.

6

No Required Textbook

- Notes posted prior to class.

- Homework assignments will be made available on the course website.

7

Grading in Statistics 416

- 25% homework

- 25% midterm exam

- 15% project (written & oral presentation)

- 35% final exam

See syllabus for more detail.

8