

Poster Assignment

The poster exercise has two major goals. One: to give you practice in integrating concepts learned in genetics class with your work in other courses, and with everyday life. Two: to give you experience in communicating scientific information in your own words. Interdisciplinary work and improved communication skills are two areas targeted by the National Science Foundation as particularly important for undergraduate students to master, even for those who do not wish to pursue careers in science. Finally, the poster should be fun. Although it does count for 20 per cent of your grade, you can choose just about any subject related to genetics that interests you and your group.

The topics listed on the next page are not exhaustive, but are intended as a guideline to get you started. You can choose one from the list, or make up your own. The media is always a good source of current topics. The best posters will apply principles learned from at least two of the three major sections of the course (Mendelian genetics, molecular genetics, and evolutionary genetics), and a discussion of ethical, legal, social, or political issues (ELSI), where you support your position with genetic principles and arguments.

Example

Let's say you've decided to study BRCA, the so-called breast cancer gene. You would start with an introduction to breast cancer (how many people are affected each year, etc). You might explain the evidence that some breast cancer is familial (pedigree data). Discuss what is actually known about the mechanism of BRCA (what does the protein normally do, if known; what are the mutations that cause the cancer). Finally, discuss one or more ELSI issues. For example, is widespread testing for BRCA reasonable? You might say no, it is not reasonable, because the amount of breast cancer accounted for by BRCA is very small. Thus the effort would be better put towards education (breast self-exams), ameliorating environmental contributions to cancer, etc. Here, you might use your understanding of genetics to argue that even people who carry the BRCA gene are not certain to develop cancer, because of environmental effects (that is, because the heritability is not 100%). Or, you might use population genetics to discuss the low frequency of BRCA in the population and hence the small fraction of breast cancer cases caused by it. On the other hand, you might say that for families that have a history of breast cancer, the test is a good idea because these people are more likely to have BRCA than the rest of the population, and the test might save lives by early detection or by reaching those most at risk and providing them with education about their chances of getting the disease. You would use your understanding of population genetics to explain how much more likely it is that people from families with a history of breast cancer would have BRCA than the population at large, and your understanding of heritability to explain what fraction of people who test positive for BRCA are likely to get the disease. This poster would then cover all three sections: Mendelian genetics (the pedigree data), molecular genetics (study of the BRCA protein and its mutations), and evolutionary genetics (population studies of the frequency of the BRCA gene).

Sorry, you may not use BRCA as your poster topic!

Technical Details

Posters will be graded according to the following scale: 50% for genetic background on the topic, covering at least two areas of genetics; 25% for ELSI as defended by genetics; and 25% for logic/style/readability. Plagiarism will not be tolerated.

The poster must be 3'8" (111.8 cm) WIDE by 2'10" (86.36 cm) HIGH, *i.e.* in landscape format. Download the instructions from the website on how to make an effective poster.

Posters are due at the beginning of class on **1 December**.

Sample Topics (not an exhaustive list)

Genetic testing and insurance (or employment; choose a specific condition as an example, plus give an overview of the topic)

Behavior genetics:

genes for criminality

genes for sexual orientation

genes for maternal behavior

Genetic basis of IQ

Human cloning

Genetics and agriculture

genetically engineered plants/GMOs

animal cloning

recombinant bovine growth hormone

Gene therapy

Eugenics

Conservation genetics

Human genome project

Human genome project diversity initiative/HapMap

Genetics of ancestry and/or ethnicity

Voluntary: Check your Poster Topic with Dr. Wayne

Purpose: to make sure your group is on track for producing a successful poster. I will check to see that your topic is relevant, that you are covering two of the three areas of genetics, that the scope of your topic is not too broad, and that you have a good ethics or policy slant to your topic.

Your poster must have at least 5 peer reviewed references. If you don't know whether or not a journal is peer-reviewed, ask a librarian, one of the graduate TAs, or Dr. Wayne. Peer-reviewed material meets standards of scientific rigor and professionalism. Now is a good time to make sure it is easy to find peer-reviewed references on your topic!

Assignment: write in bullets, outline form, or a short paragraph what your topic is, which two areas of genetics you are covering and how (your choices are Mendelian, molecular, evolutionary), and the ELSI area your topic ties into. Email it to me and I'll get back to you within 3 days (likely less unless it's a weekend).