Consequences of DNA Testing

You want to examine my DNA - as a class project?

Unless you have an identical twin, your DNA is unique to you. Therefore, DNA testing entails privacy concerns and engenders other potential consequences. Providing a sample for DNA testing is optional - you can participate in this course and use the 23andMe website without submitting a test yourself. Before the semester begins consider potential outcomes of DNA testing and discuss with family members your interest in doing a DNA test for this class. The 1st class meeting will focus on considering possible outcomes of testing and evaluating the value of testing versus the potential negative consequences. The YouTube video from a student at Stanford linked from the homepage discusses some of the things that you can learn from the analysis of your DNA. The 2nd class meeting will be 'spit day' when consent forms are signed and samples prepared.

### Potential Consequences of DNA Test Results

#### Surprising findings about family relationships
- New relatives discovered by genetic matching
- Discovery of genetic relationship between your parents
- Different relationship than expected with other tested family members

#### Surprising prediction of ancestry composition
- Individuals contain a genetic mixture representative of their ancestry through human history

#### Surprising discovery of genetic susceptibility to disease
- You and/or your children may have an increased chance of developing an incurable genetic disease

### Hypothetical Concerns Over DNA Testing

Direct-to-consumer DNA testing is relatively new, thus it is unclear at this time what some of the consequences may be in the future. Consider this, you may discover a 1st cousin that is a child of an aunt/uncle that was placed for adoption as a child 40 years ago. This child would have been born in 1975, the year Fred Sanger published an article describing a technique for sequencing DNA. The Sanger sequencing method, and its modifications, fueled the genome era. Nobody - not even Fred Sanger - could have envisioned in 1975 how easy it is today to discover genetic relationships through broadly commercialized genetic testing. I expect there are things that will be discovered in the future due to the availability of genetic testing, but these future discoveries are not currently obvious. Recognize, however, that you control your test results. They can be deleted by you at any time.

### Areas of Potential Concern in the Future

- Maternity and Paternity - as more people are tested, it will become increasingly easy to reveal personal identity through genetic relationships
- **Forensics** - DNA forensics currently uses a different set of genetic markers than what is used by 23andMe and similar companies; however, the availability of large databases of genetically characterized individuals is apparently attracting the attention of law enforcement
- Discrimination - genetic data related to health information could be used by employers or health insurance companies; however, laws exist that forbid these practices (e.g., Genetic Information Nondiscrimination Act)
### Scenarios for Class Discussion

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<tr>
<th>Scenario</th>
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<tbody>
<tr>
<td>Match indicated as half-sibling</td>
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<td>Siblings test and turn out to be half-siblings</td>
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<td>Frustration with making family connections</td>
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<td>European ancestry in an African American</td>
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<td>BRCA1 breast cancer susceptibility status</td>
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<td>Carrier status of Tay-Sachs disease</td>
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### Links

- *Are You My Cousin* by AJ Jacobs
- *Is genetic genealogy, the next Facebook of science?* by Miguel Vilar
- *Magazine Editor Sets Out To Join The Global Family Tree* on NPR
- *Joining the Global Family Reunion*
- *With genetic testing, I gave my parents the gift of divorce* by George Doe
- *Genetic testing brings families together* by Julia Belluz
- *DNA Testing* on Talk of Iowa
- *Participation in DNA Relatives* blog post to students in September 2014
- *My Medical Choice* by Angelina Jolie
- *Diary of a Surgery* by Angelina Jolie Pitt