

HOW DO WE STAY CURRENT? Part 2

[Last month](#), I offered resources to keep up with the ever-changing field of biotechnology. This month, I will explore ways I have used them to share current information and ideas with my students.

The first is related to genetic testing. This technology has evolved to the point that even home genetic tests are widely available. When I was in graduate school 30 years ago, the mantra was that sequencing could be done for “a buck a base.” Now, you can submit your own sample from home and receive information on your ancestry and a multitude of genetic traits for approximately \$200. These test results supply a wealth of information which is often accompanied by significant bioethical issues. For example: What do the results mean? Whose information is it? Should that information be shared with relatives? Should others get tested?

To help students process these questions, I make use of several videos and audio files during our genetic testing unit. While students are analyzing a gene involved with bitter tasting ability, we work through approximately one topic each day in the [Issue Response Packet](#).

We start with a couple of videos from New York Times reporter, Amy Harmon. Ms. Harmon won a Nobel Prize for her series of articles and videos about genetic testing. The first video we watch is about Huntington’s Disease (HD). Genetic tests for this disorder not only can tell you if you will get HD with nearly 100% certainty, but also can also determine the approximate age at which you will start to develop symptoms.

Unfortunately, while the test is fairly conclusive, there is no real treatment or cure for HD. The video introduces us to Katie, a young woman who comes from a family who has had several members who have had HD. Knowing what a positive test means, she explains that she wants to get tested so that she can plan the rest of her life. We discuss the ramifications of Katie taking the HD test and also talk about the fact that her parents are not a part of the video. For example, did Katie’s test results reveal genetic truths about her parents that they didn’t want to know?

The topics of our second video from Ms. Harmon are the BRCA1 and BRCA2 genes. Mutations in these genes lead to a higher chance for breast cancer and ovarian cancer. We also learn that 1% of all breast cancer cases involve males. While a positive test increases a person’s chance for cancer, it is not a guarantee, and there are proactive treatments such as mastectomy and ovariectomy.

This video focuses on another young woman, Deb, who has a family history of breast and ovarian cancer. Although she does not currently have breast cancer, Deb has learned that she has a mutation in the BRCA1 gene and has elected to have a mastectomy. We discuss the choices in this case as well and distinguish it from the HD video in terms of certainty and availability of treatment. We also talk about what to consider when the genetic tests are not as conclusive – for example, what do you do with a result that indicates a 30% increased risk?

The rest of the packet has links to other articles related to genetic privacy. Does your employer have the right to have access to your genetic information? What about if it has to do with your ability to do your job? Or to establish if the arthritis that you have is not the result of years of hard labor, but possibly due to your genes? What about in cases of safety such as being an airplane pilot when the disorder might result in symptoms such as a psychotic break (often one of the first symptoms of HD). Can the police take a discarded cheeseburger wrapper from the trash as DNA evidence?



There is one audio report from National Public Radio in this packet that is fun to work through with the students, but I should caution that it is a made-up scenario. It describes genetic testing as an admissions test for a preschool in Manhattan - Porsafillo Preschool. The audio describes that this preschool is very prestigious and getting admitted is very competitive. To keep the admission process subjective, the school requires a genetic test for DNA markers related to leadership and intelligence.

The students are often outraged that such a situation exists and that parents would go to such lengths to seek an advantage for their kids. I remind them that, while their parents didn't subject them to genetic testing, they definitely sought every advantage possible ranging from making sure that they were in the "right" elementary school in the district to making sure that they were on the best soccer teams and enrolling them in ACT prep courses so they can get into the best colleges.

The bottom line with the audio is that it was an April Fool's joke. Every year, NPR produces one article that is not accurate. They close this audio making it clear that there is no such preschool and that, in fact, "Porsafillo" is an anagram for "April Fool's." Other articles in the packet about genetic testing for athletic ability in the packet, however, are real and help the students understand the full scope of how genetic testing might be applied.

Overall, students enjoy learning about new developments in the genetic testing area, especially as these tests become more widely available. They are able to make connections between the lab activities that they are doing and real-world scenarios. I often hear back from parents that the discussions we are having in class become discussions at the dinner table. That's pretty gratifying.

Podcasts and recent news articles are just two resources to utilize. I know that all of you know of so many possible resources and are very creative in how you utilize them. One way to share your wealth of knowledge and to learn from other teachers is through our [summer teacher courses at BTCI](#). Hope that you decide to join us!

Until next time.