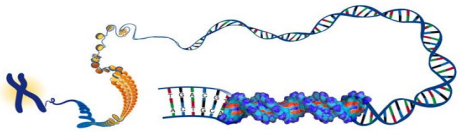
Additional information on genes, genetic testing and genome sequencing:

http://learn.genetics.utah.edu/
http://www.genome.gov/Education/
http://geneed.nlm.nih.gov/
http://unlockinglifescode.org/
http://www.yourgenome.org/



Materials in this document were adapted from:

The Educator's Guide:
http://unlockinglifescode.org/learn/educators-guide.pdf

Genetic Testing: What it means for your health & your family's health:
http://www.genome.gov/Pages/Health/genetictesting.pdf

Visualizing health:
http://www.vizhealth.org

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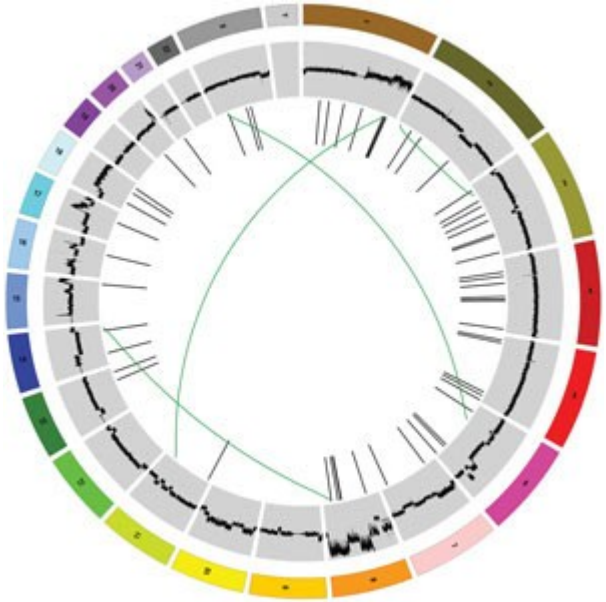
GENETICS FORUM

October 25th, 2014
8:30am-4:00pm
University of Michigan
North Campus Research Complex
Building 18, Dining Hall
2800 Plymouth Road
Ann Arbor, MI 48109

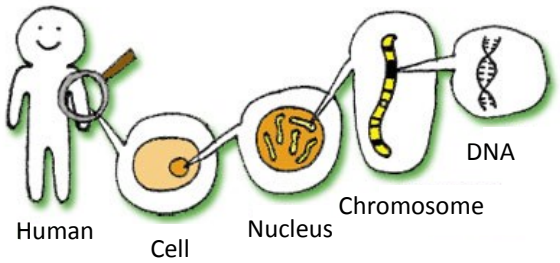
Background: Genome Sequencing



This is an illustration of the human genome.

WHAT IS A GENOME?

The **genome** is all of a person's genetic information. Every person has a genome with a unique sequence of **DNA**.



A person's DNA is **inherited** from his or her parents– one copy from each parent. Slight differences, or **DNA changes**, in his or her genome affect a variety of personal characteristics like height, eye color, personality, abilities, as well as personal risk of health conditions.

WHAT IS GENOME SEQUENCING?

Genome sequencing is a new technology that scientists use to look at a human genome. It is able to find links between an individual's DNA and personal characteristics, including the person's health.

Genome sequencing is usually done on a small sample of blood or other type of sample (like a piece of a tumor). The sample is collected by a health care provider and sent to a laboratory where it is processed and analyzed to look for changes in one's DNA sequence.

HOW DOES GENOME SEQUENCING RELATE TO HEALTH?

This technology has already helped doctors and scientists better understand the genome's role in disease. However, this is just the beginning of a new era of using genomics in health. As we learn more about how the genome and the environment interact, we can use this knowledge to improve healthcare.

As advances in genomic medicine and technology continue, tailoring drugs to an individual's genomic profile or predicting if a person will get a disease later in life could become a part of everyday medical practice. People may need to make many new and challenging personal, social, ethical, and medical decisions.

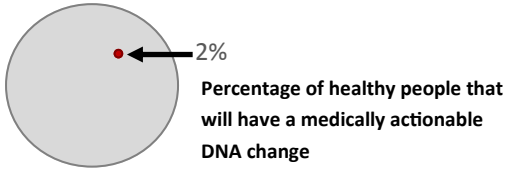
C G G T A A C
C G G C A A C

WHAT GENOME SEQUENCING CAN TELL YOU

It can help an individual predict his or her chances of getting many health conditions, choose the best course of treatment and assess one's potential response to treatment. Most of a person's DNA changes are harmless. Some give people resistance to health conditions. Some are linked to serious disorders. Even if you don't have a health condition you can be a **carrier** for a DNA change that can be passed on to your children.

WHAT GENOME SEQUENCING CAN'T TELL YOU

The risk for developing many health conditions depends on a combination of factors, including a person's genes, the way he or she lives, and sometimes just plain luck. Occasionally, even when a DNA change is found in a person, there are no treatments available for the health condition. Finding a DNA change related to a health condition is rare. Only about 2% of healthy people who have their genes sequenced will have a **medically actionable** DNA change.



UNEXPECTED INFORMATION IN THE GENOME

Genome sequencing can also tell you information that you weren't expecting to learn, called **incidental findings**. These are health conditions that you did not know you have a higher chance of developing. Incidental findings are discovered unintentionally and are unrelated to the reason the genetic test is being performed.