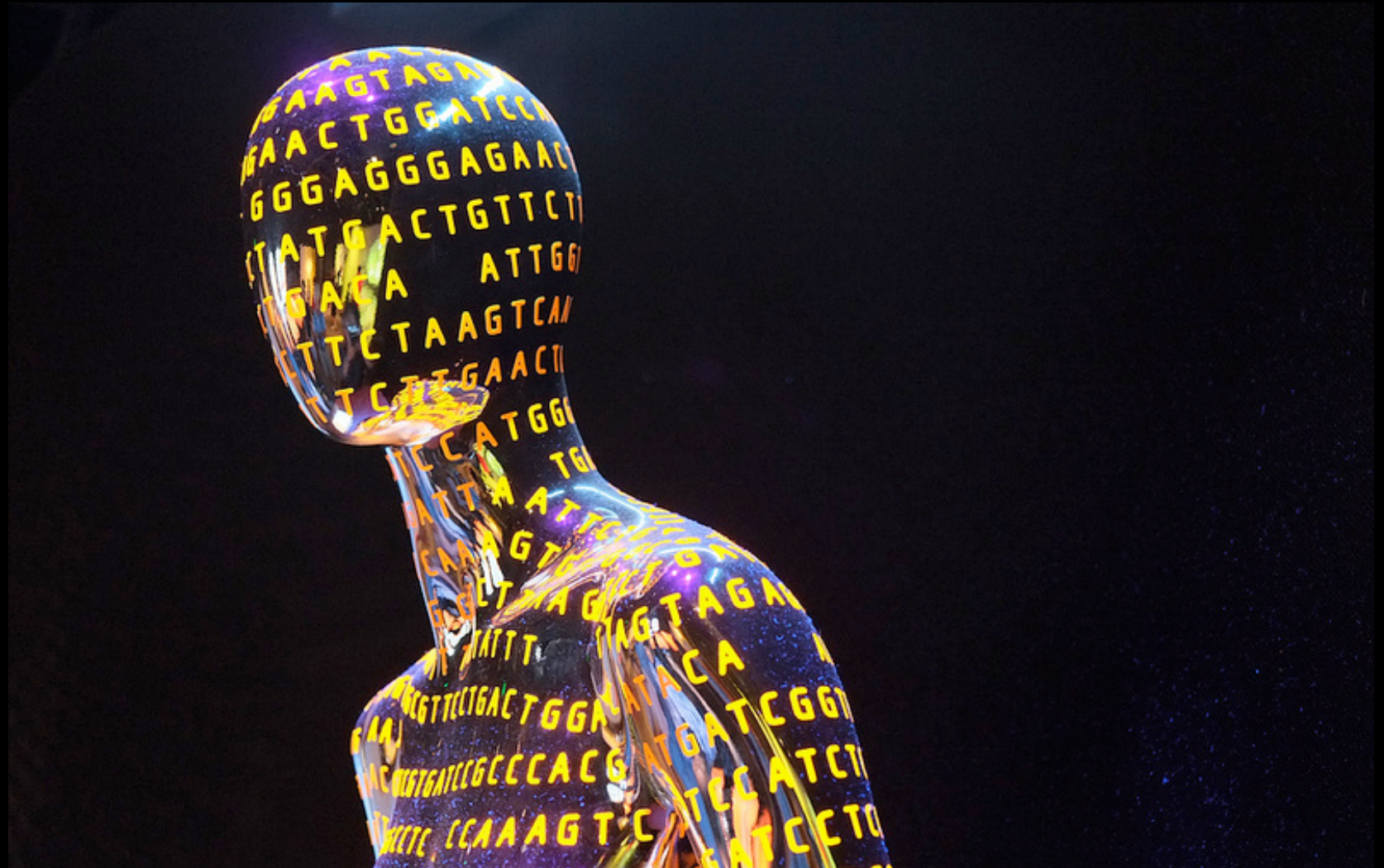


**Take out your  
DNA model**

# DNA and the Human Genome

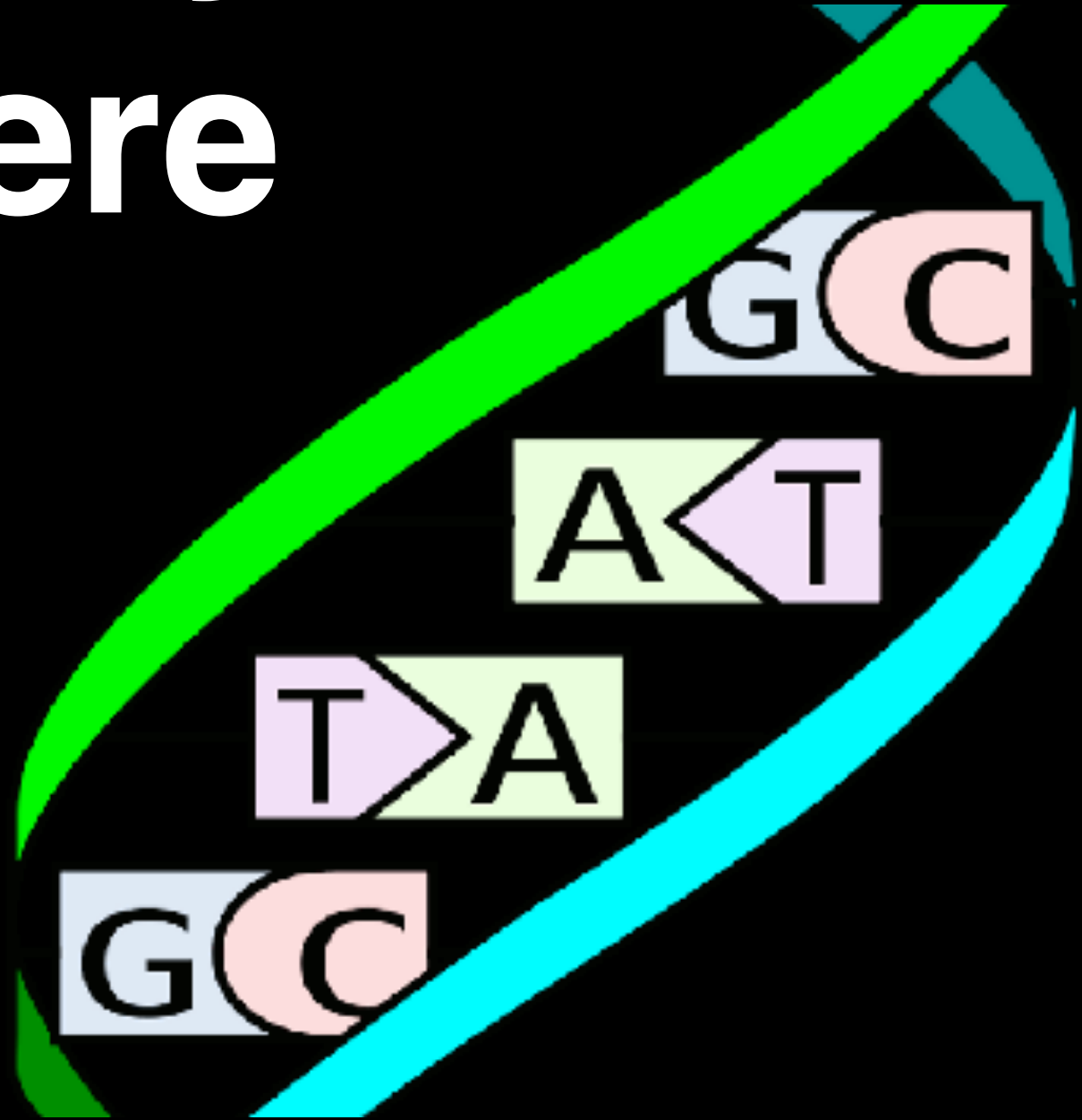


# DNA Model

**How was your  
model like actual  
DNA?**

**How was your  
model different  
from actual DNA?**

How many base  
pairs were  
in your  
DNA  
model?



# GENETIC CODE

**DNA can be written out as a code.  
On your iPad, write the code of the  
19 base pairs in your DNA model.**



How'd you do?

GCCCGCGTAAT

CGTACGGCGCG

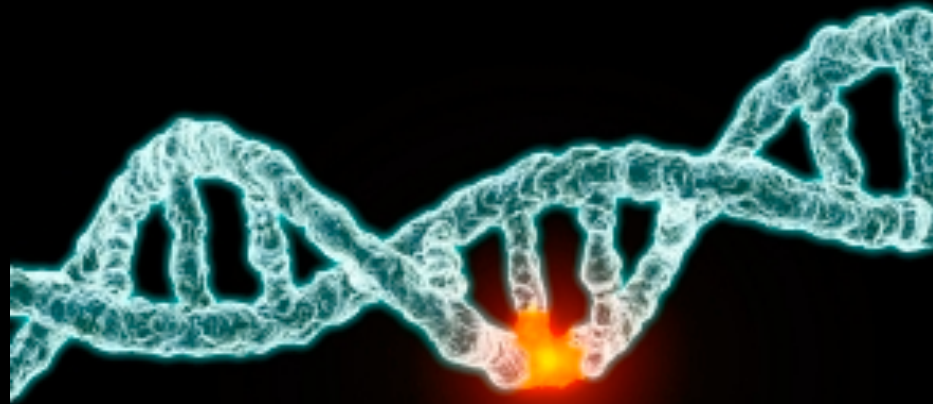
GCGCTATATAAT

**What happens if one  
part of the code is  
copied wrong?**

GCCCGCGTAATCG

GCCCGCGTATACG

**Do you think this  
ever happens in  
humans?**



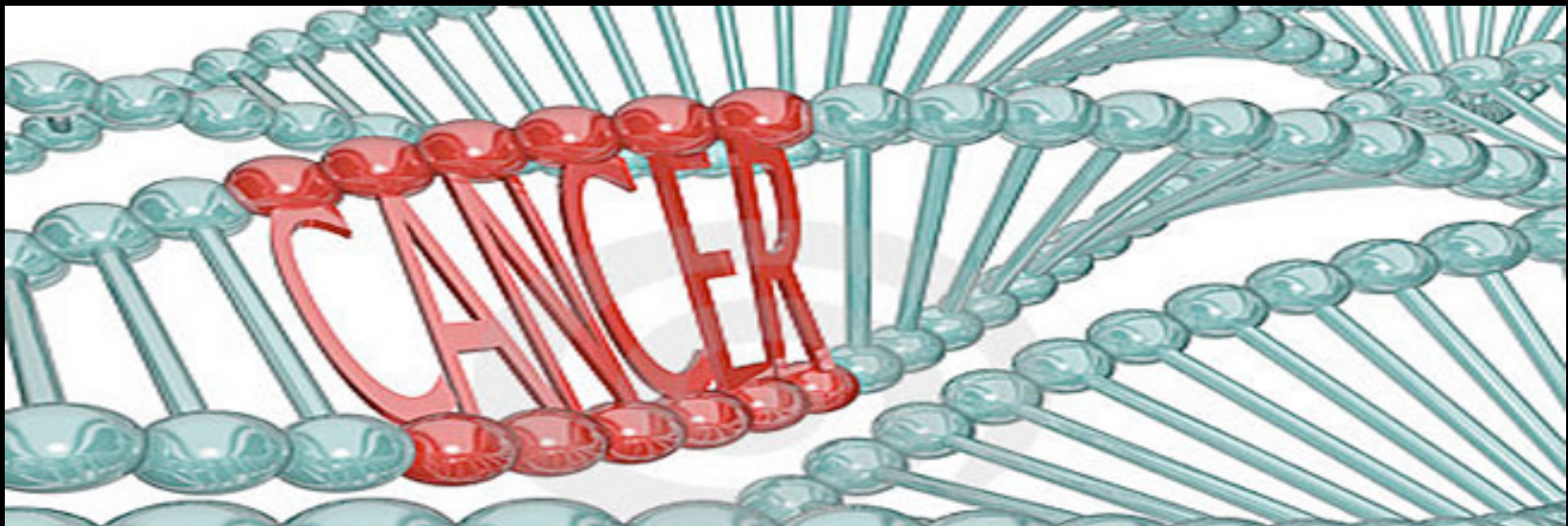


**Mistakes in the DNA code happen very frequently. They are called *genetic mutations*.**



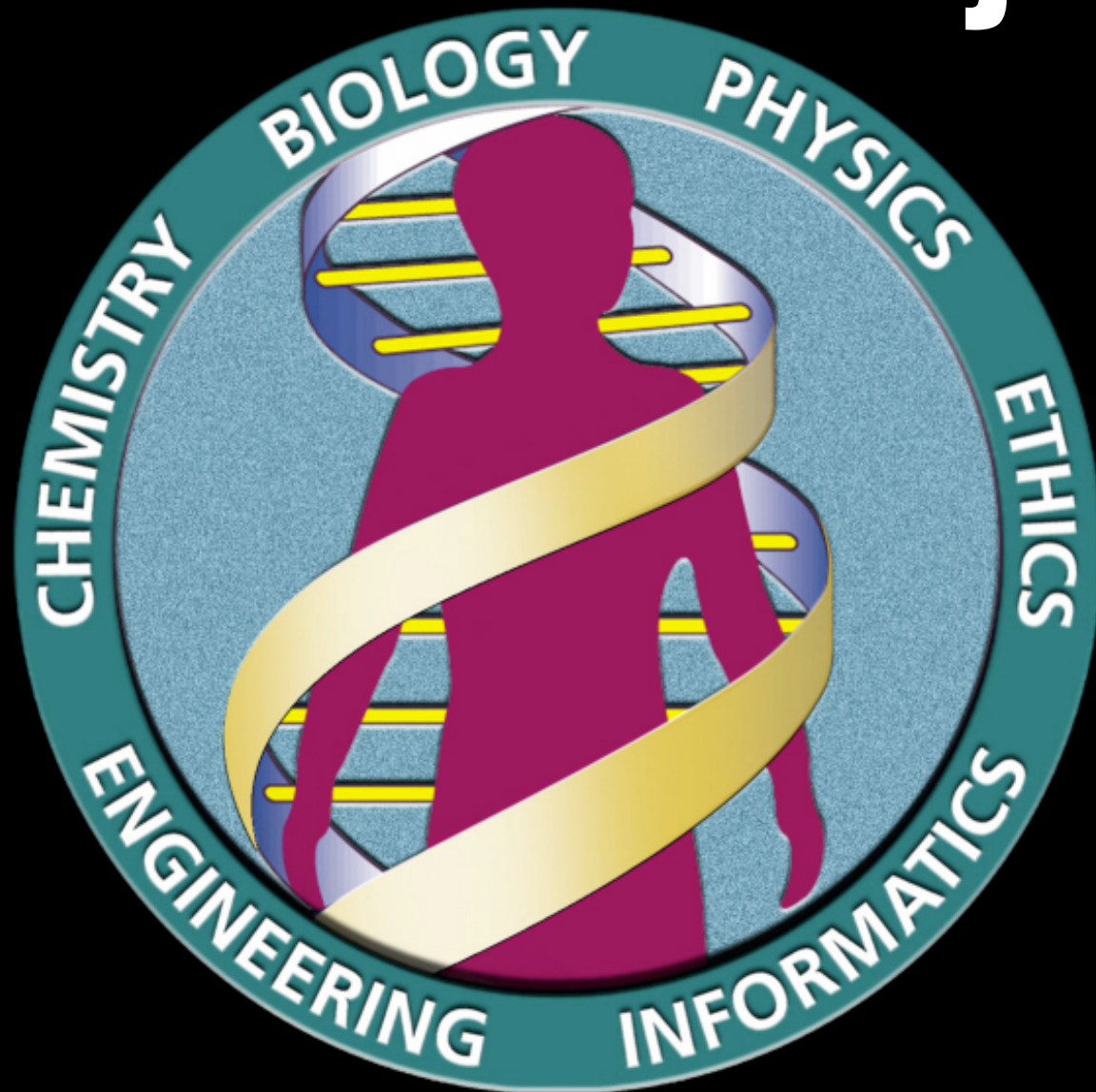
**Most mutations do not have a very big effect. However, some times the result is what is called a *genetic disorder*.**

**This includes many cancers, hemophilia, Down Syndrome, Parkinson's, and more.**



**We'll get back to  
genetic disorders,  
but first...**

# The Human Genome Project



The entire genetic code of an organism is called its *genome*.



GGATGCGTCCGGGTGCGGGTTCCOTTCCGAGTTCCOTTGG  
GTCGGGTACGGGTGCOOTTCCGAGTTCCOTTGGAACGGG  
TTCGGGTACGGGTTCOTTCCGAGTTCCOTTGGAACGGG  
GGATGCTTCCGGGTACGGGTTCOTTCCGAGTTCCOTTGG  
TCAGTGCCTTTCCAGTAAATGAGAAATCCGCCGAACAC  
ACGGGACGCCATAGAGGGTGAGAGCCCGTCTGGTAG  
GGATGCTTCCGGGTGCGGGTACCTACTGAGTTCCOTTGG  
TTTGTAGAGGATGCTTCCGAGTTATGGTTCCOTTCCGAG  
ATCTGGCTCOTTCCGGGTCCGAGTTGTAAATTTGTAGA  
TGAAGCGGCCAACAGCTCAAATTTGAAATCTGGCTCCT  
GATGCCCTCCGGGTACGTGTGCCTACTGAGTTCCOTTGGA  
GGATGCTTCCGGGTACGGGTGCOCTACTGAGTTCCOTTGG  
GACGCCATAAAGGGTGAGAGCCCGTCTGGTAGGACA  
GGATGCTTCCGGGTGCGGGTTCCOTTCCGAGTTCCOTTGG  
AGGATGCCCTCCGGGTGCGGGTTCCOTTCCGAGTTCCOTTG  
GATGCTTCCGAGTTATGGTTCCOTTCCGAGTTCCOTTGGA

**The human genome contains  
over 3 billion base pairs.**



**Scientists spent 13 years  
“mapping” the human genome.  
They finished in 2003.**



**They found that each  
person's DNA is 99.9%  
identical to all other humans**

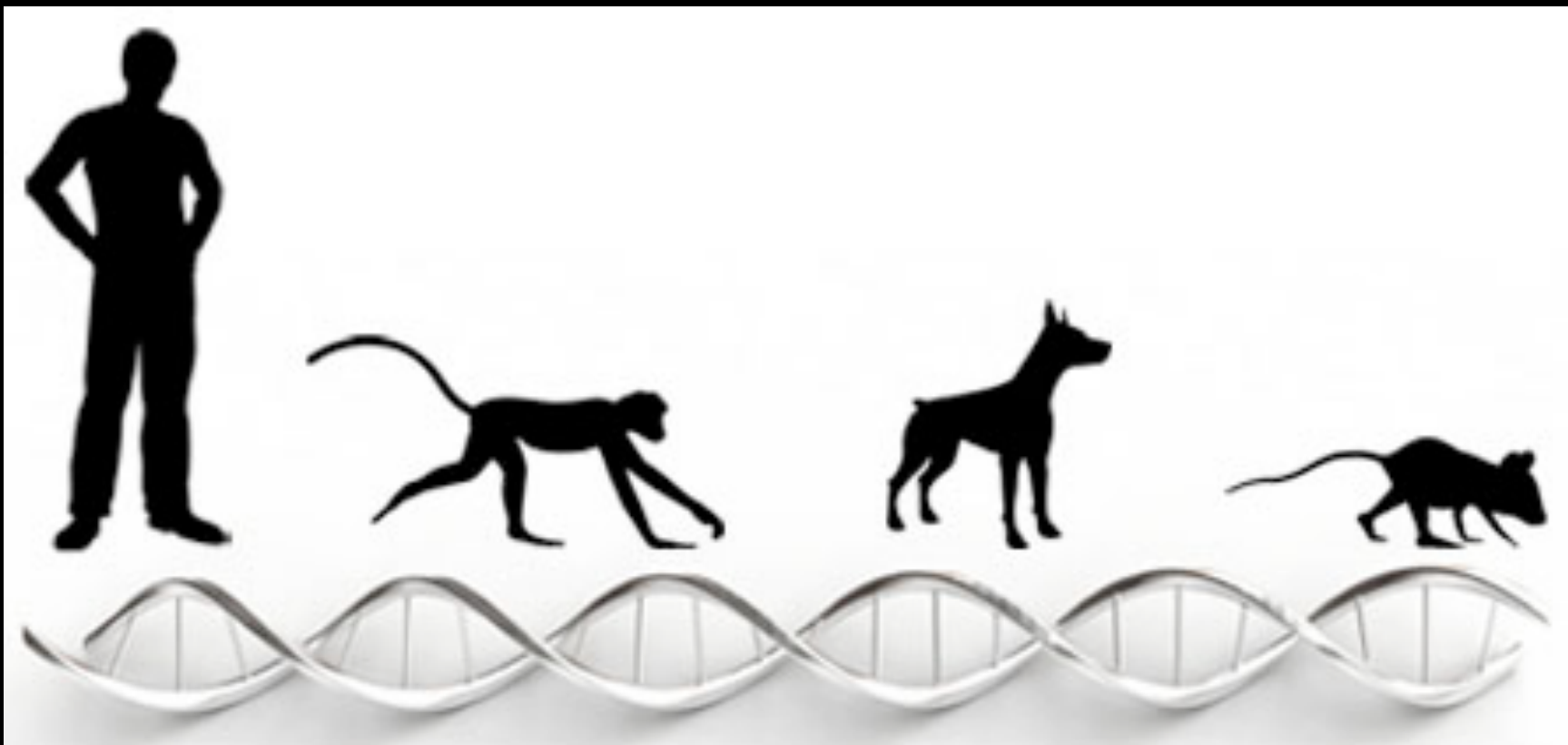




**Only 0.1% of your DNA is different  
from other human's DNA.**



Knowing an organisms  
genome helps us see how  
closely different species  
are related....



# In the past few years, services that will map an individual's specific genome have become available.

## Personal Genome Service™

Get to know your DNA. All it takes is a little bit of spit.

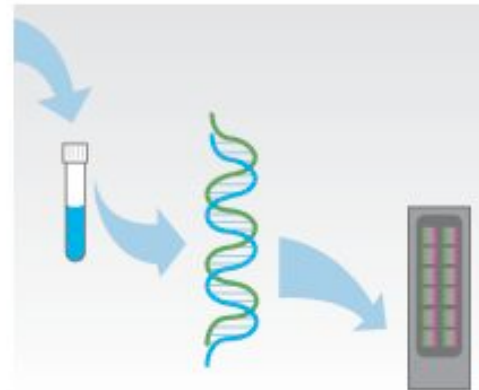
Here's what you do:



1. Order a kit from our [online store](#).



2. [Register your kit](#), spit into the tube, and send it to the lab.



3. Our CLIA-certified lab analyzes your DNA in 6-8 weeks.





4. [Log in](#) and start exploring your genome.

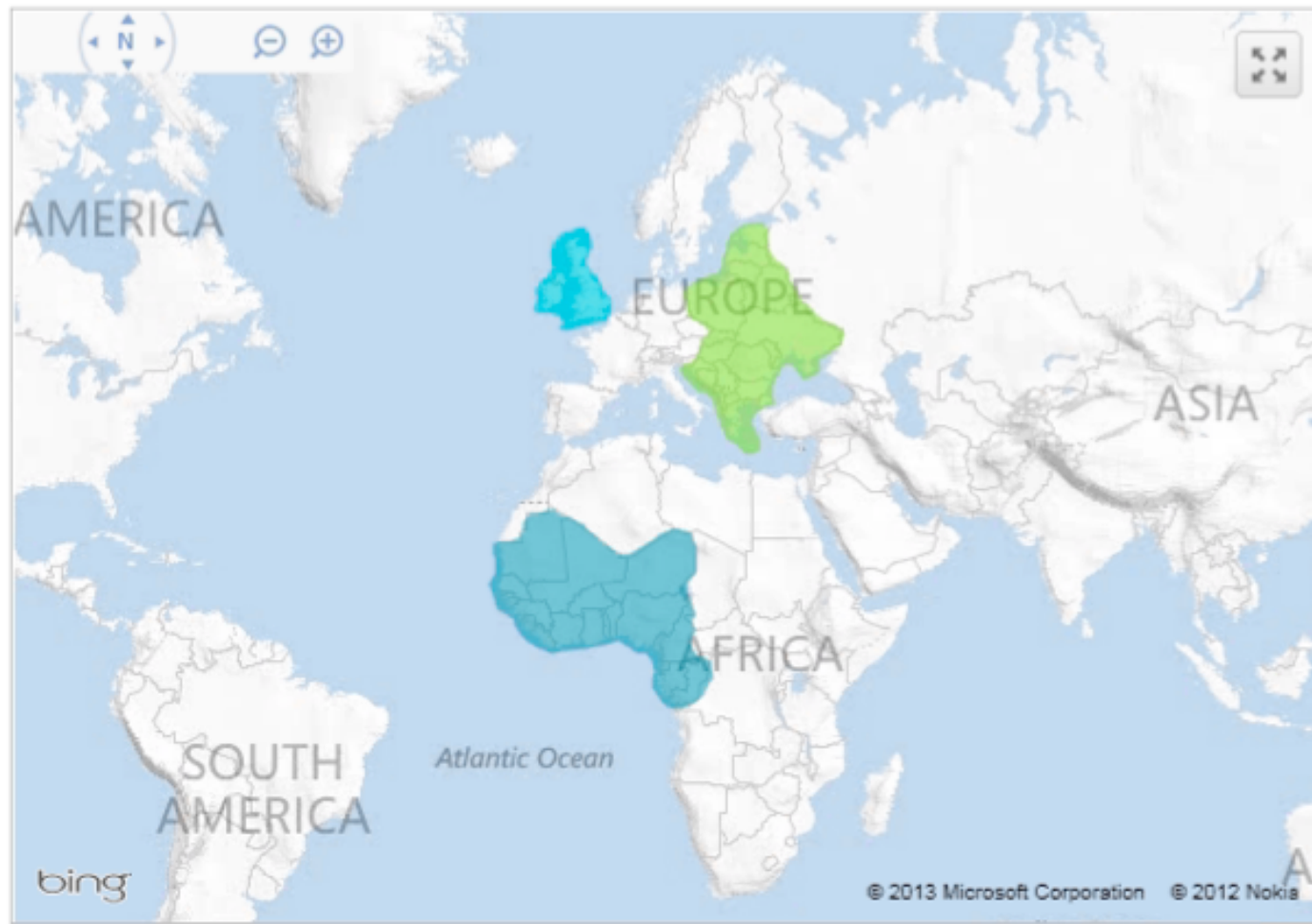
# This let's people learn about their genetic ancestry.




## Genetic Ethnicity



	West African	76%
	British Isles	11%
	Eastern European	8%
	Uncertain	5%



People can also find out if they are likely to get certain genetic diseases.

 23andWe Discoveries were made possible by 23andMe members who

## Disease Risks (120)

 Elevated Risks	Your Risk	Average Risk
Prostate Cancer 	23.4%	17.8%
Psoriasis	22.4%	11.4%
Venous Thromboembolism	17.9%	12.3%
Gallstones	11.1%	7.0%
Chronic Kidney Disease	4.2%	3.4%

**In 2013, Angelina Jolie had a double mastectomy after learning she had a 65% chance of developing breast cancer.**

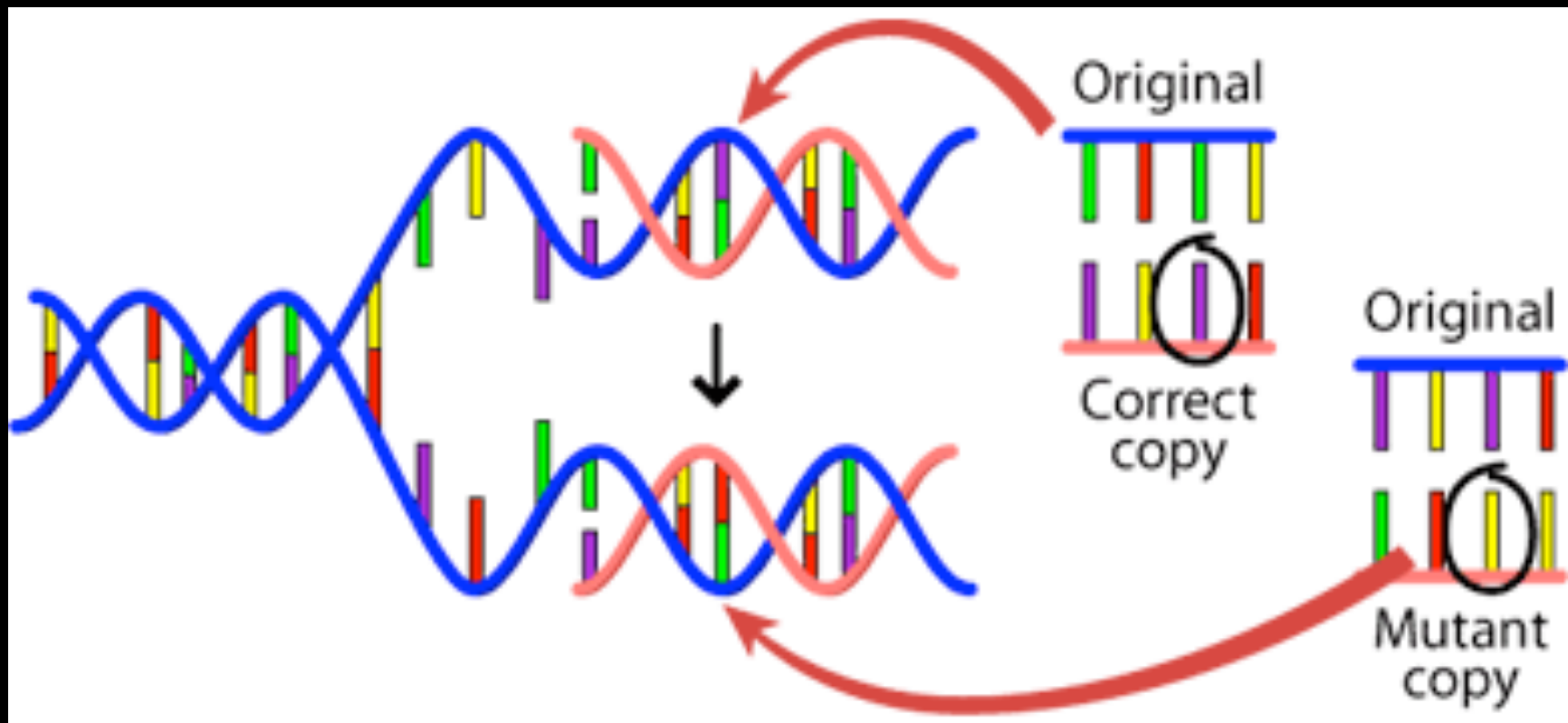


# Would you use a personal genome mapping service?

**Pros:**

**Cons:**

# Back to GENETIC MUTATIONS



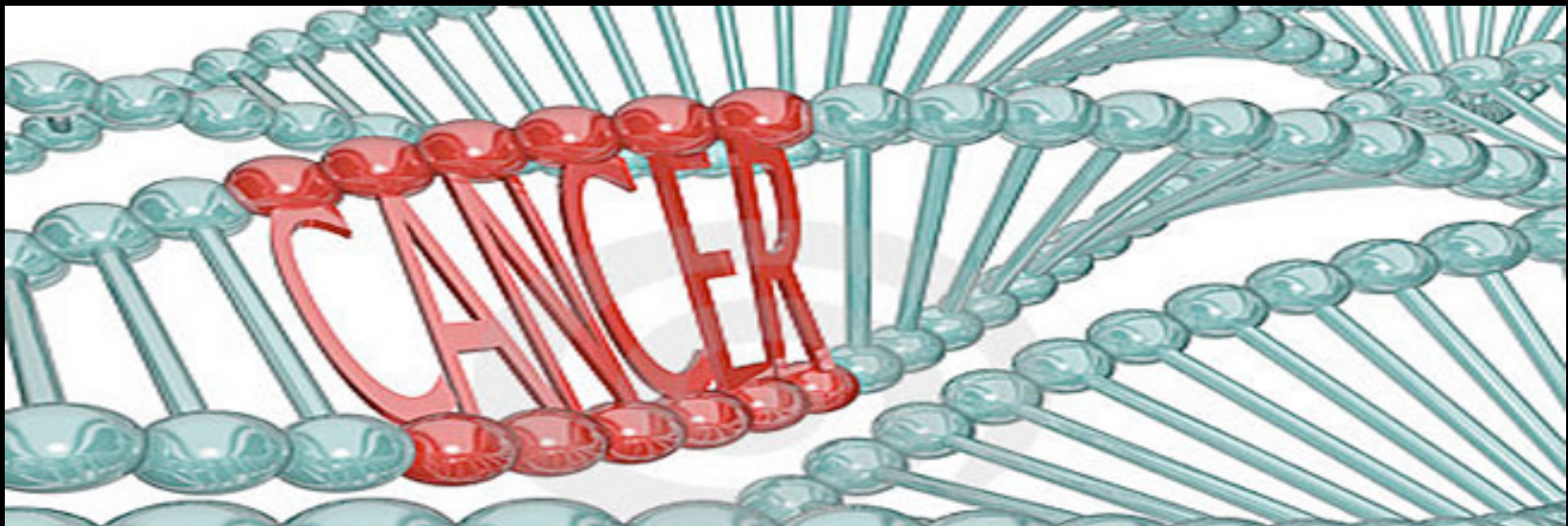


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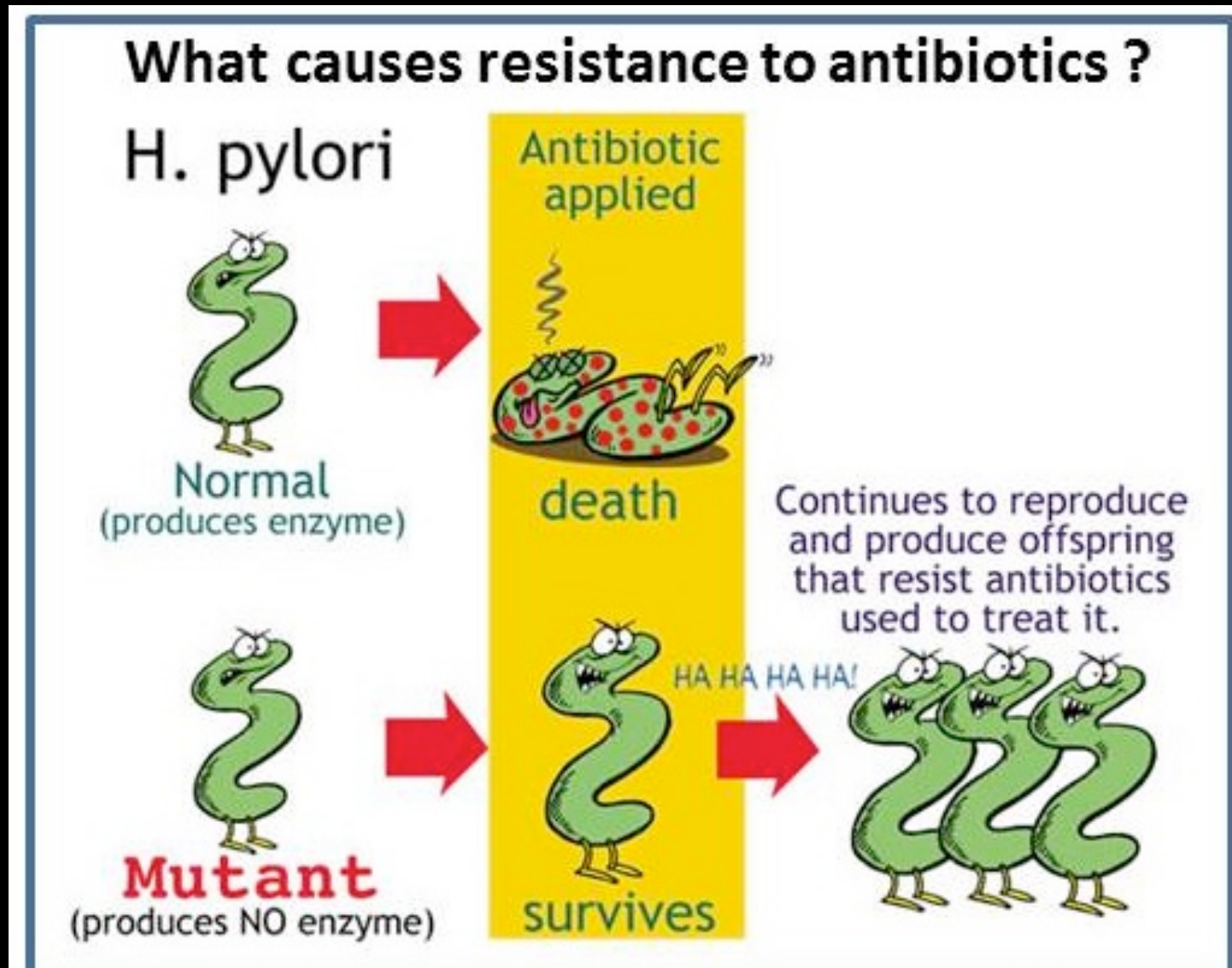
**This includes many cancers, hemophilia, Down Syndrome, Parkinson's, and more.**



**The comic X-MEN is based on the idea of genetic mutations that are beneficial.**



# Mutations like in X-Men are not realistic, however some mutations do help survival.



**We will talk more about  
beneficial genetic mutations  
when we learn about  
Evolution.**



# Assignment

Watch NOVA DNA -Cracking the Code of Life  
Check on Human Genome Links on blog.