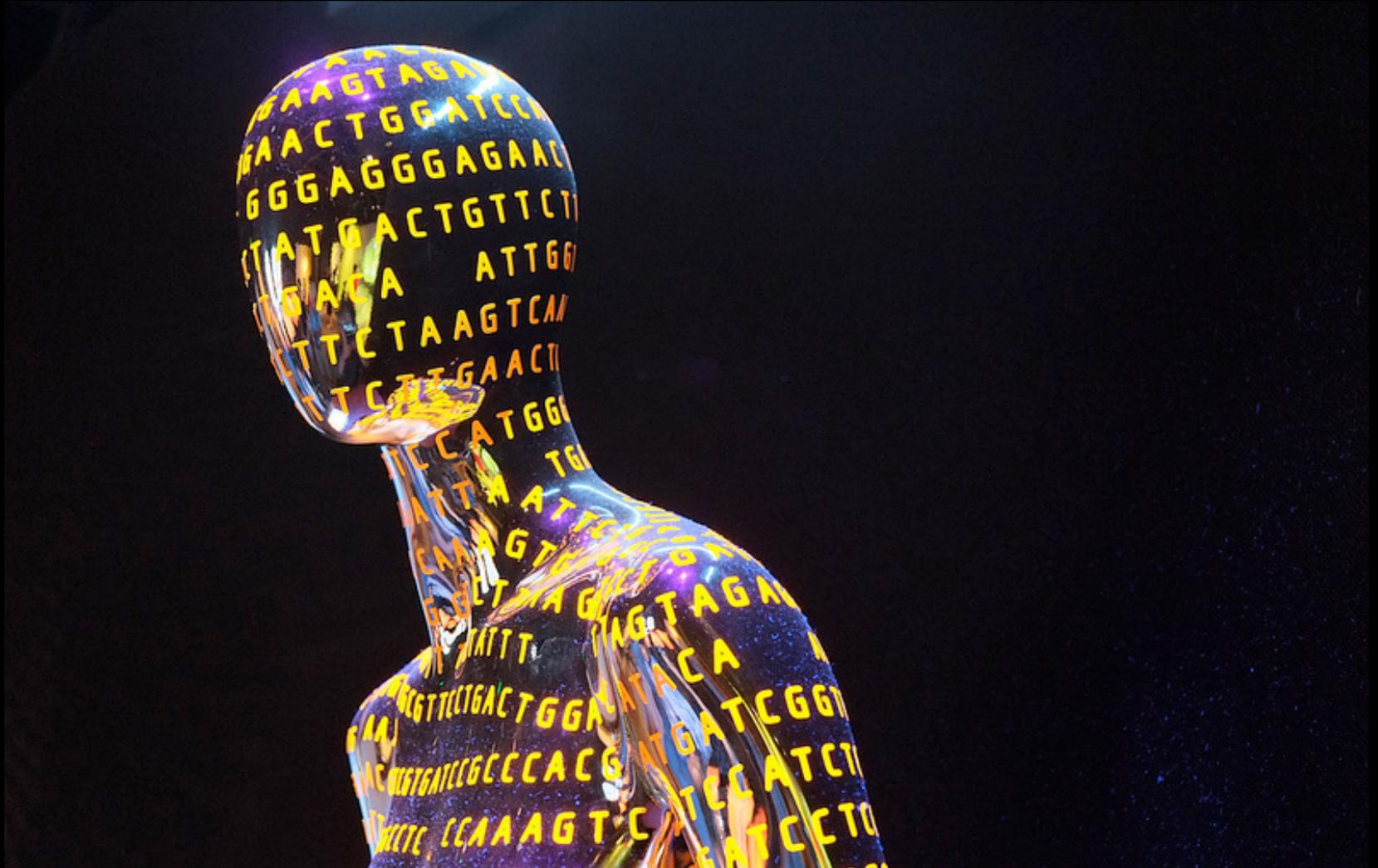


**Take out your
DNA model**

DNA and the Human Genome

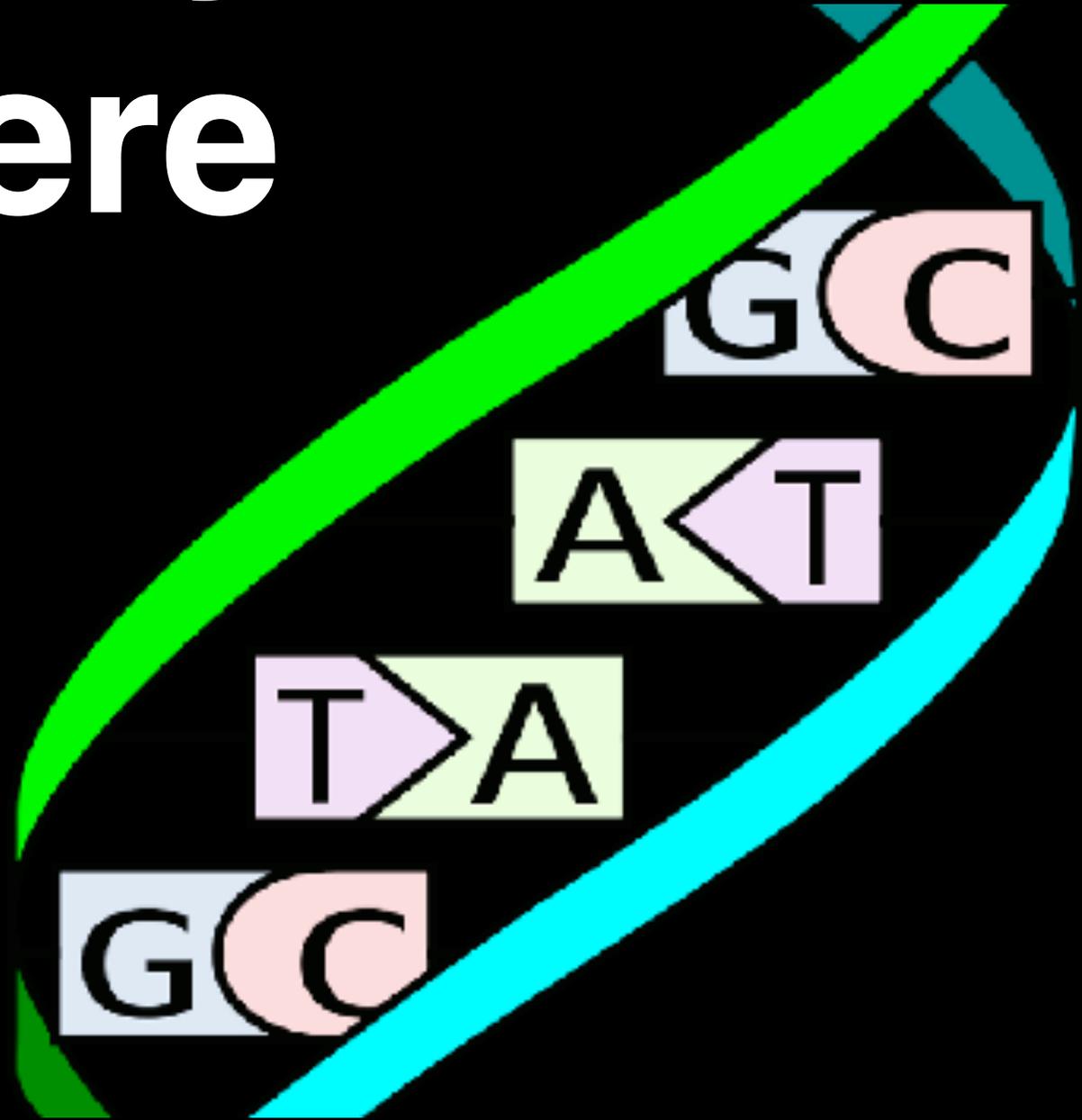


DNA Model

**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

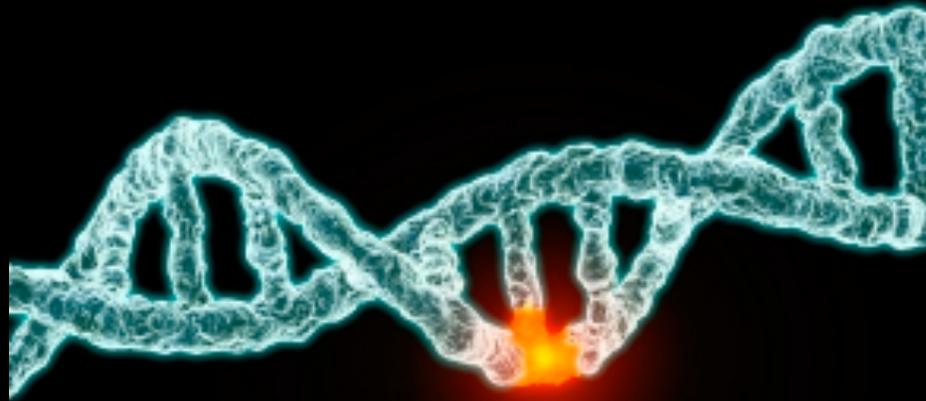
GCGCTATATAAT

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

GCCCGCGTAATCG

GCCCGCGTATACG

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

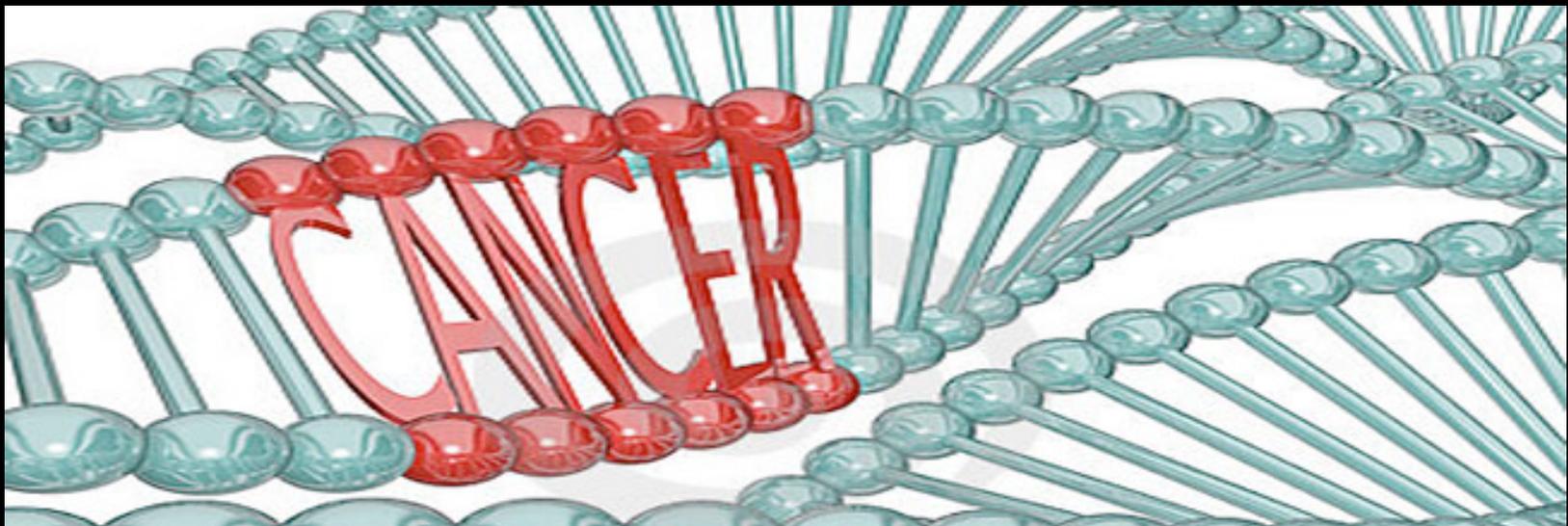


Mistakes in the DNA code happen very frequently. They are called *genetic mutations*.



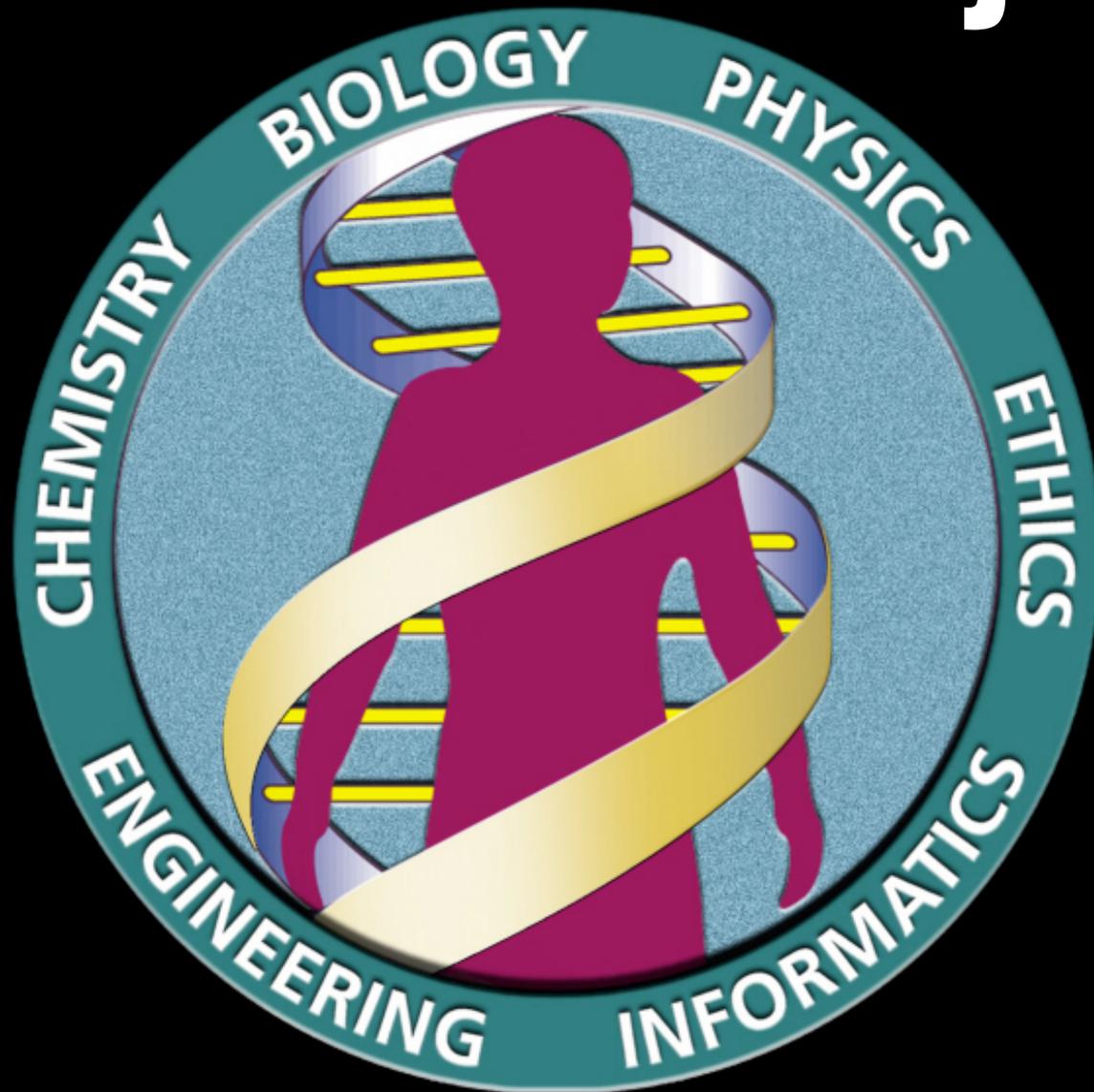
Most mutations do not have a very big effect. However, some times the result is what is called a *genetic disorder*.

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
GTCGGGTACGGGTGCOOTTCCGAGTTCCOTTGGAAACGGG
TTCGGGTACGGGTTCOTTCCGAGTTCCOTTGGAAACGGG
GGATGCTTCCGGGTACGGGTTCOTTCCGAGTTCCOTTGG
TCAGTGCCTTTTCAGTAAATGAGAAATCCGCCGAACAC
ACGGGACGCCATAGAGGGTGAGAGCCCGTCTGGTAG
GGATGCTTCCGGGTGCGGGTACCTACTGAGTTCCOTTGG
TTTGTAGAGGATGCTTCCGAGTTATGGTTCCOTTCCGAG
ATCTGGCTCOTTCCGGGGTCCGAGTTGTAAATTTGTAGA
TGAAGCGGCAACAGCTCAAATTTGAAATCTGGCTCCT
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.**



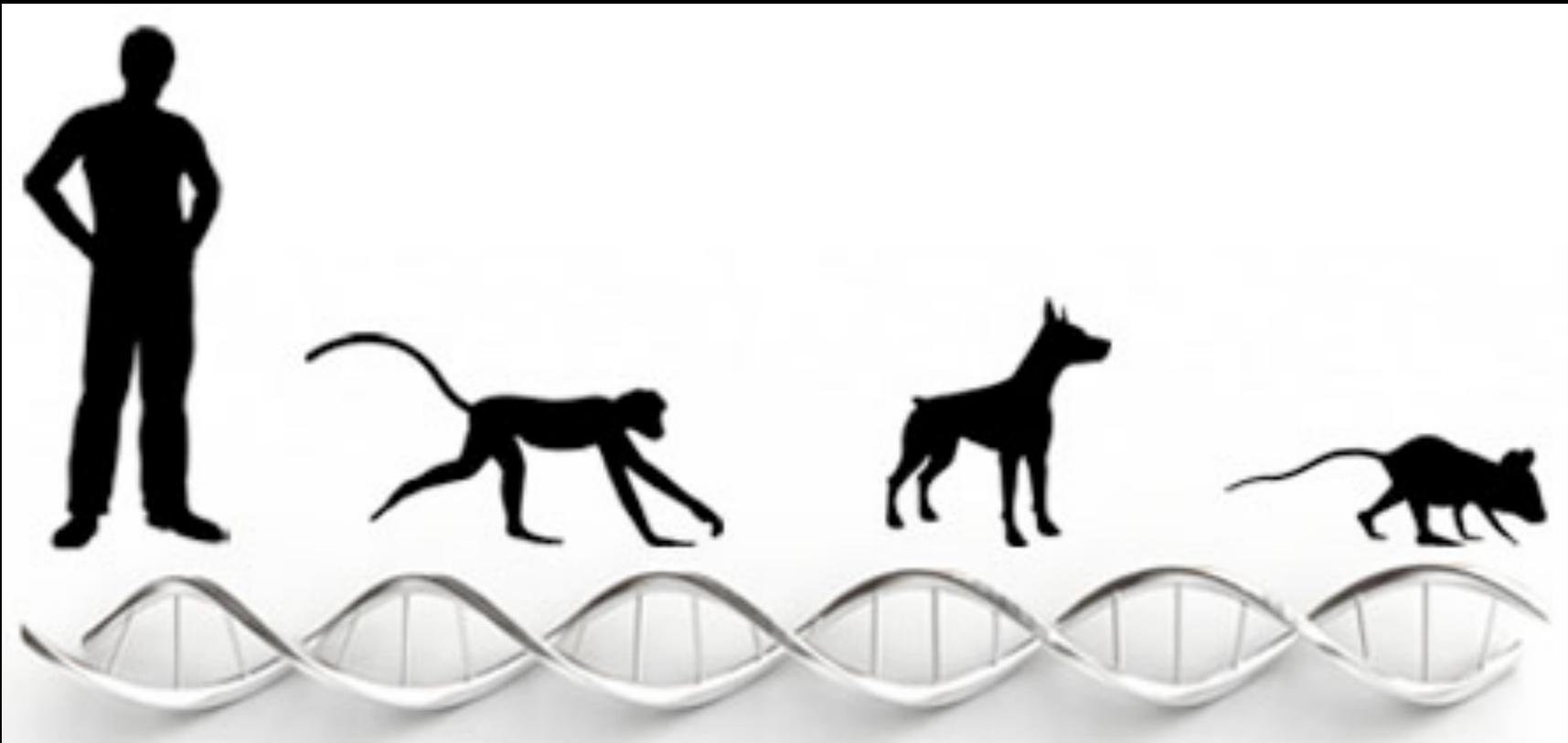
**They found that each
person's DNA is 99.9%
identical to all other humans**



**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.

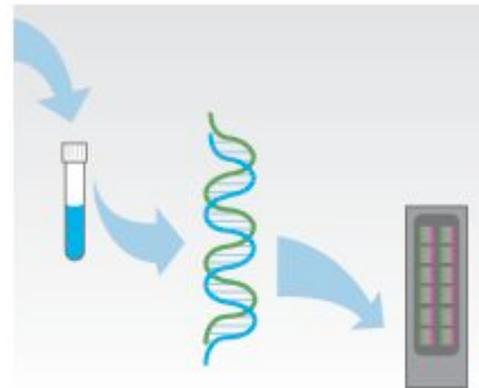
Here's what you do:



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.

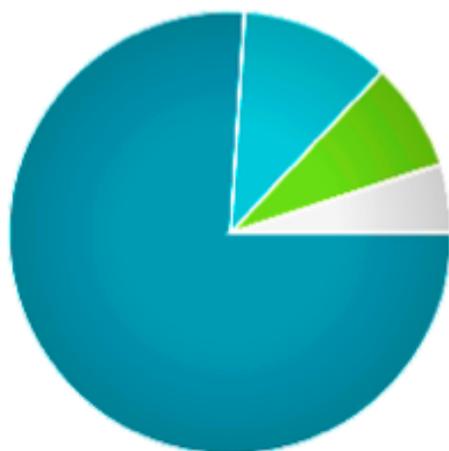


4. [Log in](#) and start exploring your genome.

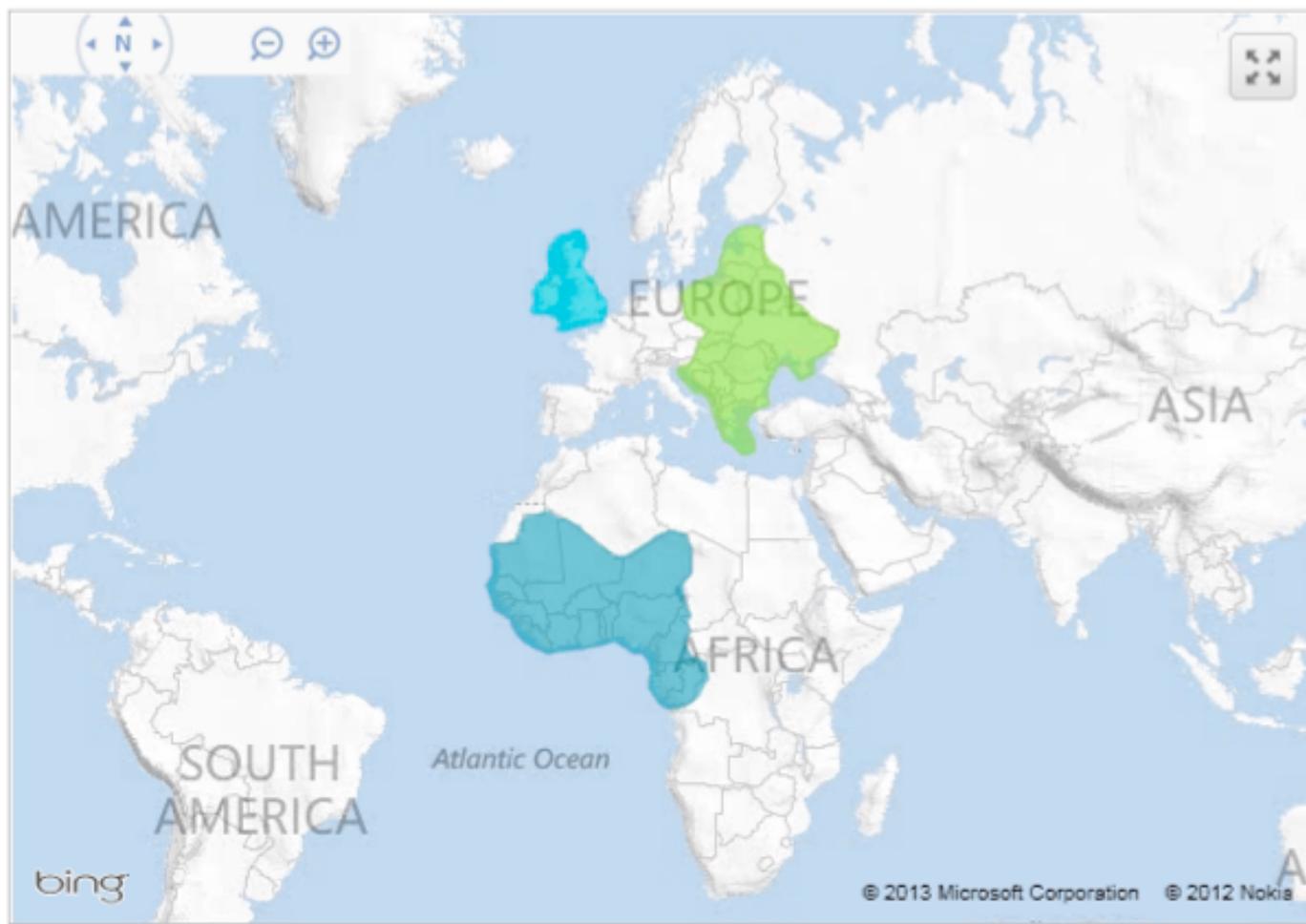
This let's people learn about their genetic ancestry.



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.

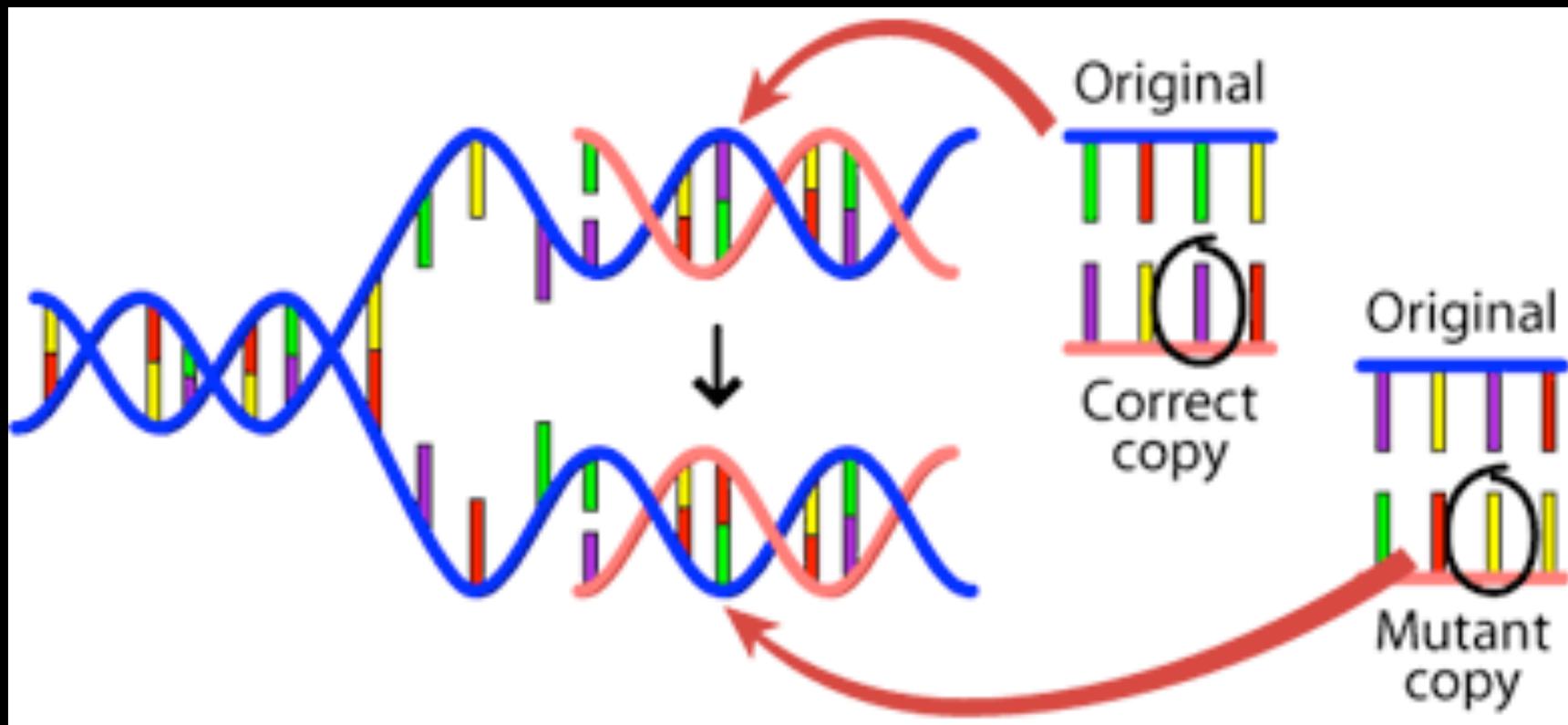


Would you use a personal genome mapping service?

Pros:

Cons:

Back to GENETIC MUTATIONS

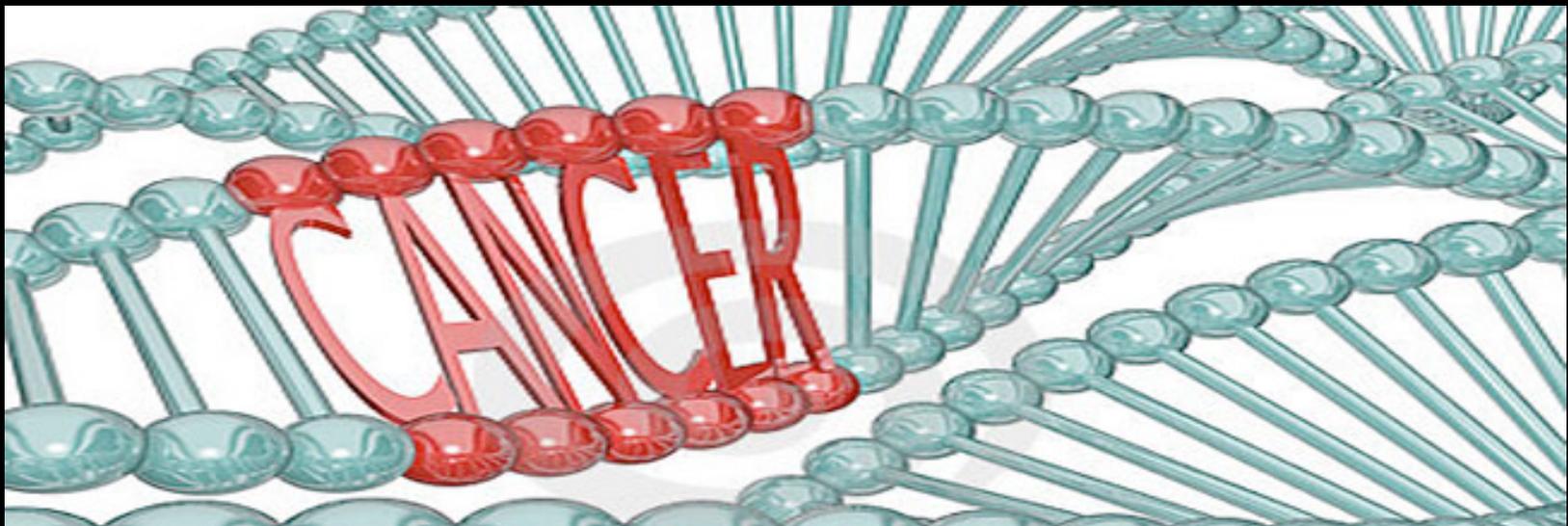


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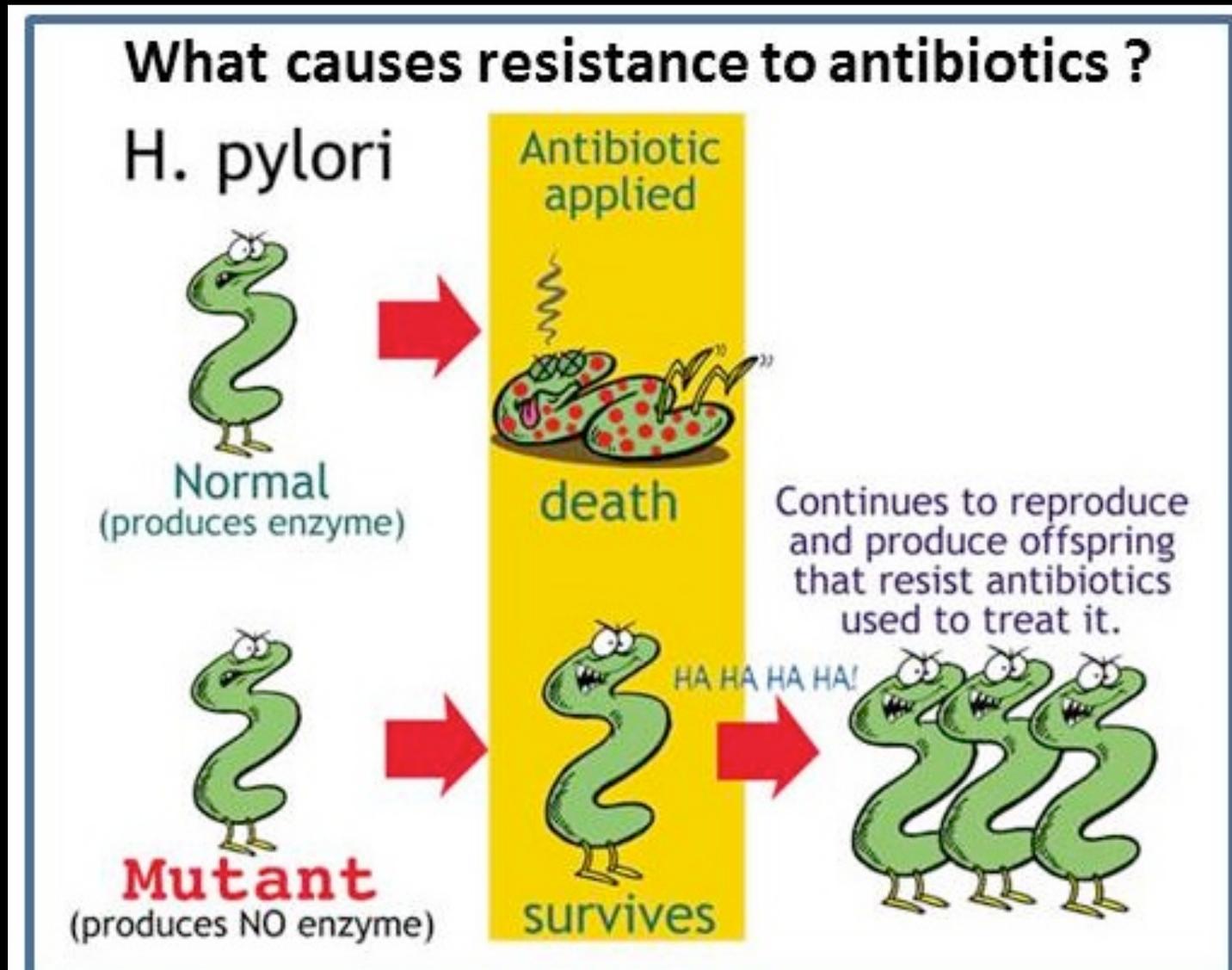
This includes many cancers, hemophilia, Down Syndrome, Parkinson's, and more.



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.