Why and How We Get Cancer – Notes

By Jeremy Shaw

Human Genome = 3,000,000,000 base pairs
One page, Times New Roman, no spaces, single spaced, font 12 = 4752 characters
3,000,000,000/4,752=631,313.1313
Merriam-Webster Dictionary (2016) = around 939 pages
Bible = around 1,200 pages
631,313/1,200=526.0942
631,313/939=672.3248
Replication errors occur 1/100,000 letters
"Over shoulder" = DNA polymerase editinG (Fig 5-10)
"Going back and fixing" = exonucleolytic editing (Fig 5-9)
1 in 10^9 mistakes First Sentence

Barbecue not barbeque

85% - Not a real stat, science-y not a real word
"Every cell" = every nucleated, eukaryotic cell (not RBC's or bacteria)

Base Pairs - Wikipedia
Really good DNA Review:

"Not even twins"

"Pretty much every other part of you" = Not cartilage or plasma
"37 trillion"

Heart Cells/Neurons/Muscle Cells don't divide

"Intestinal Cells Lost in Humans" per day; found summarized here
"50 million skin cells per day"

Daughter Cells - Wikipedia

All of the math here was shown above.

All of the terms detailed in "Really good DNA Review:"

"Just a couple of cells" = a fused sperm and egg, or a blastocyst days later.
You're Beautiful
"proto oncogenes vs oncogenes"

"cells in a baby" - Big estimation, but the number is just to get the point across.

"shut down these genes…when you're an adult" - Under "Examples of Oncongenes"

Tumor Suppressor Genes - Wikipedia

"Tumor Suppressor will cause the cell to die"

"Many Types of Proto-Oncogenes"
"Many Types of Tumor Suppressors"

Realistically, humans have two copies of each tumor suppressor genes, and both need to be inactivated to cause a decline in function. This is called the "Two-hit hypothesis"

I've heard the car analogy previously. I'm not sure to whom to give credit, but it can be found on The American Cancer Society webpage.

Local Spread = Locally Advanced Cancer
Description of two different types of spread

"Migration gene" is not a real term used in the field, but it's easier to follow with "oncogene" and "tumor suppressor" gene used earlier.

"Or a similar route" In addition to the blood stream, the cancer cells could also use lymphatic vessels, but an unnecessary detail in this explanation

"Cancer rates on the rise"
"Many Possibilities" Such as wood dust, arsenic, and asbestos

I guess this term was told to me in person because I can't find a source.. Oops! Nevertheless, here is a good source explaining why it Could be called that!

Cardiac Tumors are rare
Brain cancer arises from non-neurons
Although, I did find this article worth noting! Cancer from neurons have been created in a lab, but no evidence has been shown suggesting it happens in people.

5% of Childhood cancers are genetic.
Here is a detailed source of many known examples of specific mutated genes with statistics about childhood cancer.

"Many Possibilities" for causes of cancer
Exercise and Diet's roles in cancer

"Cut out whole words" refers to aneuploidy or losing important genes/chromosomes a common characteristic of cancer
"Adding other words where they shouldn't be" refers to polyploidy - aka extra genes or chromosomes.
Polyploidy's role in cancer

The Immune System is involved in not only involved in the Development/Metastasis of Cancer (Source 1, Source 2) but can also be targeted as a cure of cancer - to be covered in a future article.

Thanks for following along and I hope you liked it! Let me know what you want me to cover next!!