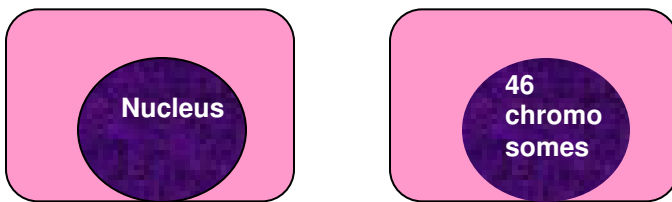
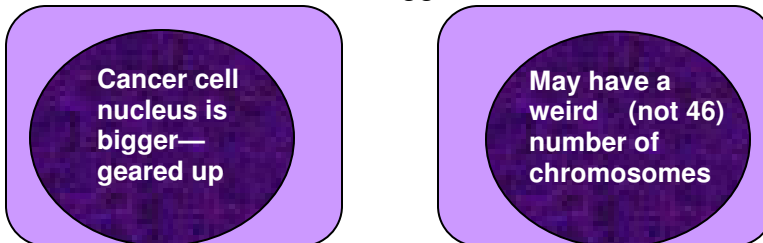


How does this ionizing radiation kill cancer cells?

The important production center of every cell in our bodies is the nucleus of the cell. Inside the nucleus are our Chromosomes—the genetic material that tells the cell to divide and grow, mend and repair itself, etc. A normal tissue or organ cell has a nucleus with chromosomes. Normal Cells in humans have a nucleus with 46 chromosomes in it

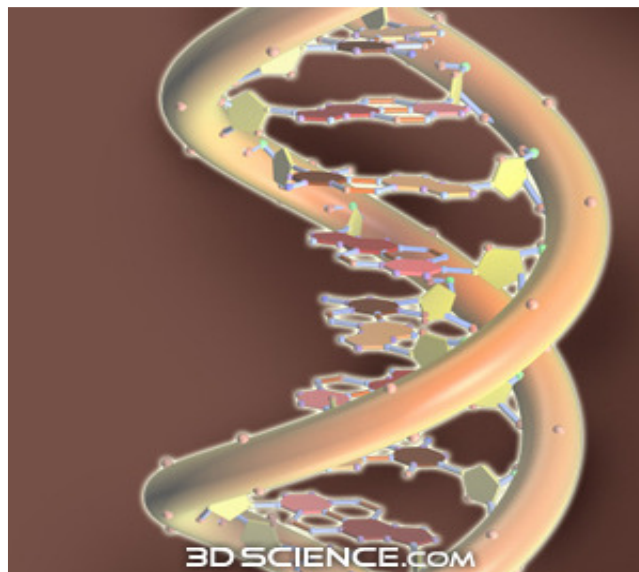


CANCER CELLS- have a bigger nucleus



Chromosomes are made of DNA. DNA is a very long molecule that is in a coiled up structure, much like a spring, or a twisted up rubber band.

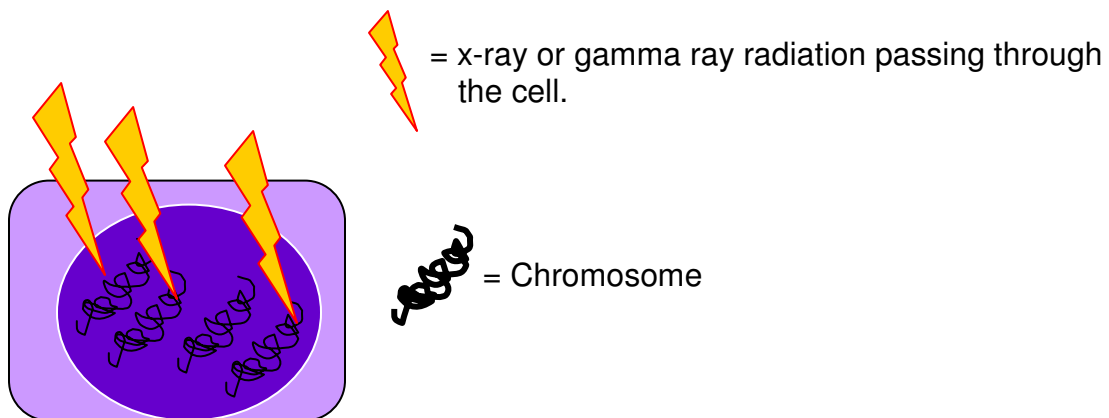
Close-up of part of a DNA strand. →



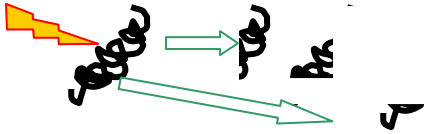


This is a huge model of DNA that some graduate students at Berkeley made. So DNA is like a big tightly wound up spring.

When ionizing radiation rays (either x-rays or gamma rays) pass through a tissue cell or a cancer cell, they will hit the DNA molecules in the chromosomes in the nucleus.



The chromosomes are the part of the cell that is sensitive to radiation, and the chromosomes that are “hit” by the radiation energy are damaged:



The chromosomes literally break apart.

Normal cells have many enzymes that can repair radiation damage. These enzymes go to work immediately to repair the normal tissues, such as skin, muscle, lining cells of the body.

THE CANCER CELLS, ON THE OTHER HAND, BECAUSE THEIR CHROMOSOMES ARE NOT NORMAL, DO NOT HAVE A HIGH AMOUNT OF THESE REPAIR ENZYMES. The cancer cells die. (HOORAH!!) Once the cancer cells die, the immune cells move in to clean them up. Some immune cells will lay down some scar tissue to heal over the area.

Next, we will discuss the side effects of radiation.

Thanks,

Dr. Marge Barnes