11.2: How Cancer Arises

Cancer is a genetic disease—that is, it is caused by changes to genes that control the way our cells function, especially how they grow and divide.

Genetic changes that cause cancer can be inherited. They can also be the result of errors that occur as cells divide or environmental exposures that cause damage to DNA, the molecules inside cells that carry genetic information and pass it on from one generation to the next. Cancer-causing environmental exposures include substances, such as the chemicals in tobacco smoke; and radiation, such as ultraviolet rays from the sun.

Each person’s cancer has a unique combination of genetic changes. As the cancer continues to grow, additional changes will occur. Even within the same tumor, different cells may have different genetic changes.

In general, cancer cells have more genetic changes, such as mutations in DNA, than normal cells. Some of these changes may be the result of the cancer, rather than its cause.