We often like to say cancer is always genetic but not always hereditary. What we mean is that cancer develops as a result of accumulated DNA damage or mutations. Most of the time those mutations are acquired from a variety of different sources over the course of a lifetime like environmental exposures, lifestyle habits, occupational hazards, or certain types of viruses. Sometimes these mutations happen by random chance. Acquired mutations are also called somatic mutations.

Cancer occurs because these DNA mutations cause a cell to quickly grow and divide without normal cellular regulation while continuing to accumulate more and more genetic mutations. At some point, this leads to formation of cancer (or a tumor). Because tumor cells have acquired so many genetic mutations along the way, the sequence of DNA isolated from a person’s tumor can be very different from that individual’s inherited DNA.

In some cases, testing for the specific mutations that are driving a cancer can help to determine what treatments would be best to use. More and more therapies are being developed that can more accurately target these mutations that are specific to one cancer, which often results in better outcomes with fewer side effects.

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