

Health

Most Cancer Is Out of Our Control

Random DNA changes are usually to blame

BY ALICE PARK

WE THINK WE KNOW WHAT CAUSES CANCER: smoking, the sun's UV rays, tumor-causing genes we inherit from Mom and Dad. But these factors alone can't explain why cancer in its many forms is poised to edge out heart disease as America's No. 1 killer within the next few years. That rise has sparked a spate of research into how much of cancer is within our control and how much of it is simply a roll of the genetic dice.

Now, in an eye-opening study published in *Science*, researchers report that the majority of cancer types are the result of pure chance, the product of random genetic mutations that occur when stem cells—which keep the body chugging along, replacing older cells as they die off—make mistakes copying the cells' DNA.

Cristian Tomasetti and Dr. Bert Vogelstein at the Sidney Kimmel Comprehensive Cancer Center of Johns Hopkins University School of Medicine found that the more stem cells there are in certain kinds of tissues and the more often they divide, the more likely that tissue is to develop cancer over a person's lifetime. About 65% of cancers are the result of these DNA mistakes made by stem cells.

Only a small proportion of a tissue's cells are stem cells, which are essentially templates for making more tissue. The catch is that this kind of DNA copying is also the process behind cancer, which is triggered by cells that pick up mutations in their genes when they divide.

The element of chance does not, however, mean you should stop wearing sunscreen or take up smoking. "My biggest fear is that people will do nothing. The opposite is true," says Tomasetti, who stresses that while we may not be able to prevent all tumors, we can focus on early detection and taking advantage of lifesaving treatments like chemotherapy and radiation, among other things. "We need to do everything we did before, but we want to do it even more than before."

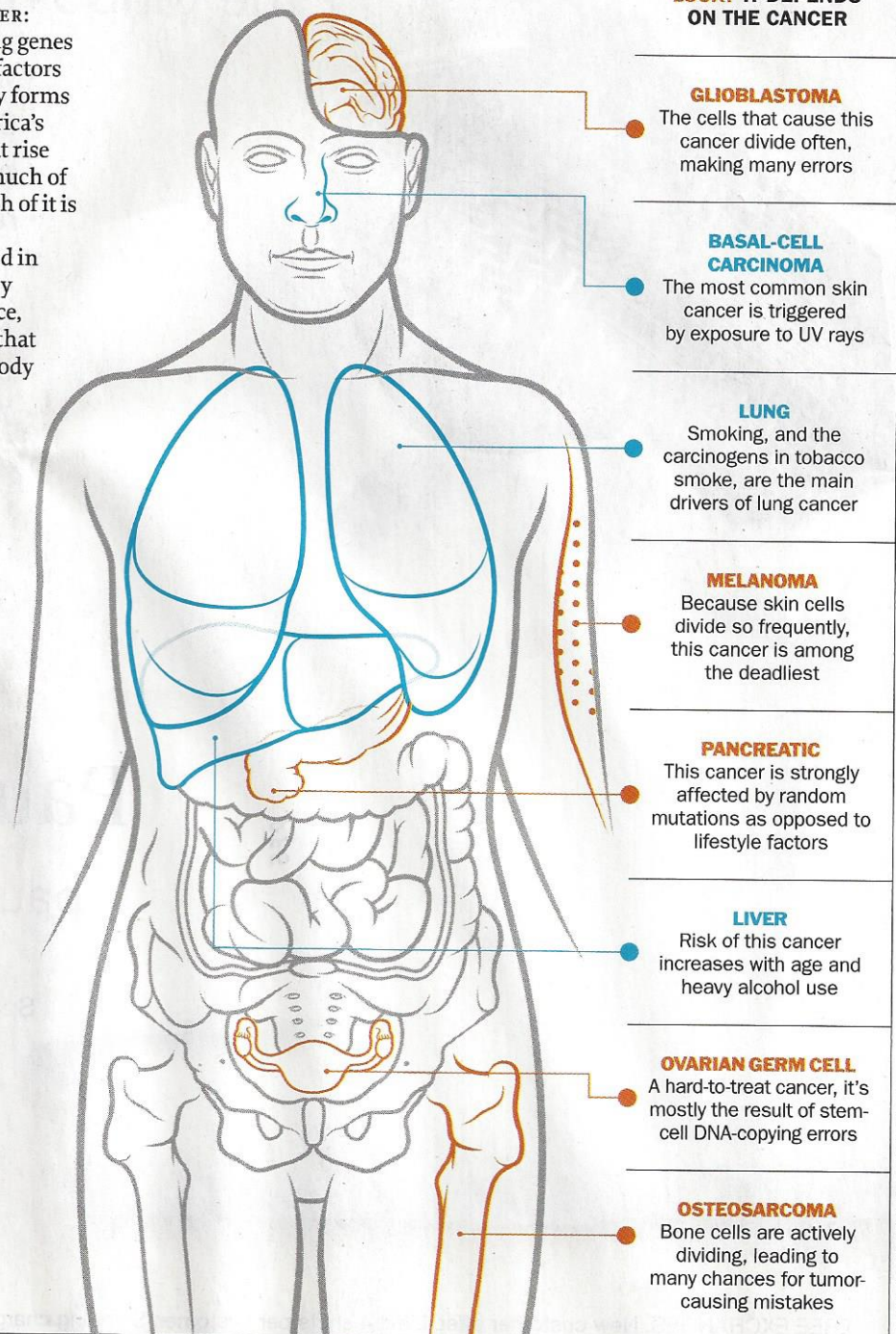


ILLUSTRATION BY TODD DETMERS FOR TIME

Source: *Science*