**DNA traces of ancient viruses may help fight cancer, study finds**

**Infections of ancestors lying dormant in DNA can be activated to help immune system attack tumours**

Remnants of ancient viruses passed down over thousands or even millions of years in human DNA could help fight cancer, a study has found.

Scientists at the Francis Crick Institute were studying lung cancer, the leading cause of cancer-related deaths globally, to understand why some patients respond better than others to immunotherapy.

Through their research, [published in Nature this week](https://www.nature.com/articles/s41586-023-05771-9), they found the dormant relics of old cells can be activated by cancerous cells. This, they discovered, can then inadvertently help the immune system target and attack the tumour.

Scientists said the “fascinating” findings could be used to help more people to survive lung cancer by boosting cancer treatment or even prevent it.

Julian Downward, the associate research director and head of the oncogene biology laboratory at the institute, said: “This work opens up a number of new opportunities for improving patient responses to immunotherapy, a crucial step in helping more people survive lung cancer.”

By observing immune cell activity in mice with lung cancer and in human lung cancer tumour samples, the researchers found that antibody-producing white blood cells called B cells contribute to the immune response to lung cancer by producing tumour-binding antibodies.

When they looked at the target of this response, they found that the antibodies recognised proteins expressed by ancient viral DNA, known as endogenous retroviruses (ERVs), which form about 5% of the human genome and are passed down from the historic infections of our ancestors.

In the majority of healthy tissue these viral genes are silenced, but in cancers they can be woken up.

“We now know that areas of B cell expansion can help us predict a positive response to checkpoint inhibition,” said Downward. “With more research, we could work to boost B cell activity in a targeted way for the patients less likely to respond.”

George Kassiotis, the head of the retroviral immunology laboratory at the institute, said: “ERVs have been hiding as viral footprints in the human genome for thousands or millions of years, so it’s fascinating to think that the diseases of our ancestors might be key to treating diseases today.

“With more research, we could look to develop a cancer treatment vaccine made up of activated ERV genes to boost antibody production at the site of a patient’s cancer and hopefully improve the outcome of immunotherapy treatment.”

The research was part of the TracerX study, funded by [Cancer](https://www.theguardian.com/society/cancer) Research UK, which has been tracking lung cancers and showed earlier this week cancer’s “near infinite” power to evolve.

Dr Claire Bromley, from the charity, said more research was needed to develop a cancer vaccine, but added: “Nevertheless, this study adds to the growing body of research that could one day see this innovative approach to cancer treatment become a reality.”

**Πηγή:** <https://www.theguardian.com/science/2023/apr/15/dna-traces-of-ancient-viruses-may-help-fight-cancer-study-finds>