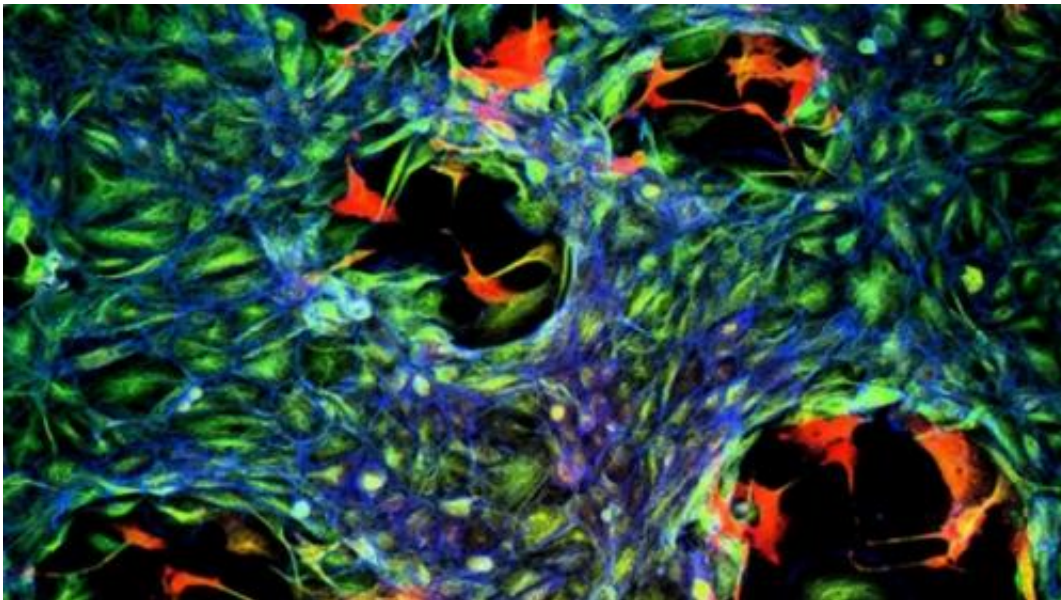


Scientists discover 'brakes' to stop cancer-causing 'car-crashes' in cells

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(Medical Xpress)—Cancer Research UK scientists have discovered a new role for a protein that may put the brakes on cancer by stopping DNA from snapping, according to a study published in the journal *Cell*.

The [protein](#) called 'RECQL5' acts like a brake by attaching to another important protein called RNA polymerase II – which makes new proteins from our genes – and slows it down so it runs more smoothly, and does not stop and 'crash' while travelling along DNA.

The scientists, at the Cancer Research UK London Research Institute (LRI), found that if RNA polymerase stops, this can lead to catastrophic collisions with another protein known as DNA polymerase.

When these molecular machines collide on a long gene, like a stationary car being hit by an oncoming lorry on a fast road, this event can cause catastrophic damage to the DNA – breaking it, which may eventually lead to the cell becoming cancerous.

The RECQL5 protein helps prevent such collisions and reduces the likelihood that these potentially [cancer](#)-causing events occur.

Study author, Dr Jesper Svejstrup, a Cancer Research UK scientists at the LRI, said: "We've known for some time that cells that have lost the protein RECQL5 are more likely to become cancerous, but until now, we've not been sure why this is.

"Our latest study shows that RECQL5 plays a vital role in moderating RNA polymerase II speed and ensuring stable progress across genes, which appears to reduce the number of collisions it makes with oncoming DNA [polymerase](#) proteins on long genes.

"Knowing more about this weakness in some cells could open up exciting new possibilities for targeting cancers with this mistake."

RECQL5 belongs to a family of five proteins known as RecQ helicases, three of which are linked to rare genetic diseases that predispose a person to developing cancer.

Nell Barrie, Cancer Research UK's senior science communications manager, said: "Discovering more about the nuts and bolts of what causes cancer will speed up the development of better treatments and improve our understanding of peoples' risk of developing the disease."

More information: "RECQL5 Controls Transcript Elongation and Suppresses Genome Instability Associated with Transcription Stress."
Saponaro, Marco et al. *Cell* (2014) DOI:
[dx.doi.org/10.1016/j.cell.2014.03.048](https://doi.org/10.1016/j.cell.2014.03.048)

Provided by Cancer Research UK

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