

Targeting enzyme may tip cancer 'over the edge'

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Researchers from the University of Dundee have identified an enzyme critical for cell division that could potentially be targeted to tip tumours 'over the edge' into remission.

A team led by Professor Paul Clarke and Dr. Adrian Saurin, from the University's School of Medicine, discovered that the enzyme USP9X controls the proper timing of [cell division](#), the process that makes new cells during the growth and repair of tissues.

When a cell divides it faces the difficult task of separating its duplicated DNA perfectly into two new daughter cells that are genetically identical. Our cells have evolved an ancient defence system that prevents DNA from segregating incorrectly during division and the Dundee research has shown that USP9X plays a vital role in this defence.

When USP9X is not present, cells divide with the type of errors typically seen in [cancer cells](#). These errors allow cancer cells to become genetically diverse, which in turn makes it easier for them to find the genetic combinations they need to overcome any barriers they may face, including chemotherapy treatment.

This could explain why some tumours turn off USP9X to survive. But USP9X could provide an Achilles heel for the many tumours types that still have its activity intact.

"Tumours live life on the edge," said Dr. Saurin. "Many cancers have

evolved to generate just enough division errors to become diverse, but not too many, otherwise this could be lethal for the cancer cells.

"One way that [cancer cells](#) manage to find this right balance is by decreasing the activity of a large enzyme called the anaphase promoting complex, or APC. We believe targeted USP9X inhibition may be able to elevate APC activity to increase division errors and push tumours over the edge."

The paper is published in in the latest edition of the journal *Cell Reports*.

Provided by University of Dundee

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