Cancer Protection Secret Revealed

Scientists say they have discovered a missing link in the way cells protect themselves against cancer.

They have uncovered how cells switch a gene called p53, which can block the development of tumours, on and off.

The researchers say the finding has important implications for cancer treatment and diagnosis.

The study, published in Genes And Development, was carried out by teams of scientists in Singapore and the University of Dundee.

The p53 gene, first discovered 30 years ago, plays a vital role in keeping the body healthy by ordering damaged cells to commit suicide, or by stopping them dividing while key repair work is carried out.

In half of all cancers the gene is either damaged or inactive, giving damaged cells a free rein to keep dividing and form cancer.

In the latest study, the scientists used a genetic trick to make zebrafish turn green when the p53 gene was switched on to explore the way it was regulated.

They found that the p53 gene makes not only the well-established p53 protein, but also an alternative "control switch" variation of the p53 protein - known as an isoform.

Radiation doses

Normally zebrafish, which carry the same p53 gene as humans, can survive low doses of radiation, which causes damage to the DNA, because the gene steps in to repair that damage.

But no such repair took place in zebrafish without the isoform switch, and they died after radiation exposure.

The researchers said this proved that the switch played a crucial role in enabling p53 to do its repair work.

Lead researcher Professor Sir David Lane, said: "The function of p53 is critical to the way that many cancer treatments kill cells since radiotherapy and chemotherapy act in part by triggering cell suicide in response to DNA damage.

"So understanding more about how this gene is controlled in cells is really important in finding ways to prevent cells from turning cancerous."

Lesley Walker, Cancer Research UK's director of cancer information, said: "This is a really exciting study which improves our understanding of how the p53 gene works.

"Discovering how it is regulated will have incredibly important implications in the development of better drugs and ways to diagnose cancer."

Source: BBC