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Combining images and genetic data proves gene loss behind aggressive ovarian cancers

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Cancer Research UK scientists have shown that loss of a gene called PTEN triggers some cases of an aggressive form of ovarian cancer, called high-grade serous ovarian cancer, according to a study published in *Genome Biology* today.

In a revolutionary approach the researchers from the Cancer Research UK Cambridge Institute made the discovery by combining images from cancer samples with genetic data. They proved conclusively that loss of PTEN was commonly found only in the cancerous cells and not the 'normal' cells that help make up the tumour mass.

PTEN acts as a brake in healthy cells, preventing a chain of events from occurring that triggers cells to rapidly divide and make new copies. Loss of this gene removes this brake - a genetic mistake that is already known to trigger the development of many cancer types.

The discovery could pave the way for new treatments that are able to block cell signals switched on in tumours with low levels of PTEN.

Study author, Dr Filipe Correia Martins, at the Cancer Research UK Cambridge Institute, said: "Very little is known about the genetic faults behind this form of aggressive ovarian cancer. But our important study conclusively proves that PTEN is a key player in this disease. The next step is to develop our approach to be able to rapidly identify tumours with low levels of PTEN, so that doctors can pick the best treatments."

The study looked at images and genetic data from The Cancer Genome Atlas - a collection of samples from hundreds of different cancer types cataloguing all the genetic changes. The team analysed levels of PTEN in around 500 ovarian tumour samples. The images helped researchers to home in on PTEN levels in the cancer cells while ignoring the other cells in the samples.

Around 7,000 women are diagnosed with ovarian cancer each year in the UK and 35 per cent will survive for at least 10 years.

Nell Barrie, senior science information manager at Cancer Research UK, said: "We urgently need better treatments for ovarian cancer. Research like this gives scientists and doctors a clearer view of what is driving this form of ovarian cancer and has the potential to lead to new treatments.

"The mix of genetic faults within cancers has posed a major challenge in taking tumour samples that give a more accurate snap-shot of the disease. Combining imaging and genetic data could be a major step forward in this conundrum."

More information: Martins, F., et al. Combined image and genomic analysis of high-grade serous ovarian cancer reveals PTEN loss as a common driver event and prognostic classifier *Genome Biology* (2014)

Provided by Cancer Research UK