

# New research shows 'DNA tags' could guide treatment for advanced ovarian cancer

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A Cancer Research UK study has identified chemical 'tags' on DNA in patients' tumours that could help doctors decide the type of chemotherapy women with advanced ovarian cancer should receive, according to a new paper published in the journal *Clinical Cancer Research*.

The DNA tags could be used to assess whether patients will benefit from their current treatment or if other drugs should be tried, as well as indicating whether their cancer is likely to come back.

Cancer Research UK scientists from Imperial College London and the Institute of Cancer Research, London, found these tags – known as

epigenetic markers – at genes known to be linked with [ovarian cancer](#).

They looked for associations between particular tags and features of the disease, including how well a patient responded to [chemotherapy](#) and how quickly their cancer returned after the first round of treatment.

The team looked at the epigenetic markers in around 150 ovarian cancer tumours from women in the UK and then confirmed what they discovered in over 300 ovarian tumours from a world-wide study.

The markers are located at regions of DNA called CpG islands, which behave like switches controlling genes by turning them on and off through a process known as DNA methylation. Previous studies have shown that when this process malfunctions it can lead to cancer development and affect how tumour cells respond to chemotherapy.

They found 29 markers that identified how quickly a patient's tumour came back after standard treatment. Of these, epigenetic markers at three genes; NKD1, VEGFB and PRDX2, were found to be most strongly associated with how well a patient's tumour would respond to carboplatin-based chemotherapy, the front-line treatment, and how long a patient would be in remission.

In addition, some of the markers identified were at genes that may be targets for another type of chemotherapy drug, bevacizumab (Avastin), which is known to improve survival of ovarian cancer patients when used in combination with carboplatin-based chemotherapy. These epigenetic markers may help to select [patients](#) who will particularly benefit from this treatment.

Professor Bob Brown, a Cancer Research UK scientist at Imperial College London and Institute for Cancer Research, said: "Our study shows that epigenetics is important for ovarian cancer and we may be

able to tailor chemotherapy according to the epigenetic characteristics of a woman's ovarian tumour.

"These findings also mean we could be able to predict how likely it is that a patient's tumour will come back and find ways to stop the tumour recurring or developing resistance to chemotherapy."

Dr Kat Arney, science communications manager at Cancer Research UK, said: "Thanks to research, we know more about how our genetics underpin cancer than ever before. Genetic markers are already used in some cancers, such as breast, to help doctors decide which treatments to give. But, we still don't know much about epigenetic markers, or their particular role in ovarian cancer.

"Understanding how ovarian cancers differ epigenetically might help doctors in the future to decide what treatments to give. And we hope that studies like this could lead to more improvements in [treatment](#) in the future, for people affected by all types of [cancer](#)."

Professor Brown will be chairing a session on 'Targeting the Epigenome' at the National Cancer Research Institute (NCRI) Cancer Conference next month.

**More information:** Dai, W et al. Promoter CpG Island Methylation of Genes in Key Cancer Pathways Associates with Clinical Outcomes in High Grade Serious Ovarian Cancer (2013) *Clinical Cancer Research*. [DOI: 10.1158/1078-0432.CCR-13-1217](https://doi.org/10.1158/1078-0432.CCR-13-1217)

Provided by Cancer Research UK

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