

PRESS RELEASE

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GENE 'SWITCHES' COULD PREDICT WHEN BREAST CANCERS WILL SPREAD TO THE BRAIN

SCIENTISTS have found a pattern of genetic 'switches' – chemical marks that turn genes on or off - that is linked to breast cancer's spread to the brain, according to research* presented at the National Cancer Research Institute Cancer Conference in Liverpool today (Wednesday).

The researchers, based at the University of Wolverhampton, studied 24 breast cancers that had spread to the brain, along with samples from the original breast tumour, and found a handful of genes with faulty switches.

Crucially, two of the genetic switches became faulty early on in the development of breast cancer, suggesting they may be an early warning signal for tumours that will spread to the brain. The scientists are now working to develop a blood test that might be able to detect these signals at an early stage, before the disease has spread.

Up to 30 per cent of breast cancers will eventually spread to the brain, often many years after the first tumour was treated. Tackling secondary brain tumours with radiotherapy and surgery has limited success, with most women surviving just seven months after the brain metastasis has been diagnosed.

By comparing chemical switches, known as DNA methylation, between the original breast cancer and the secondary brain tumour the researchers were able to narrow down from 120 potential candidates to find a 'signature' for cancers that had spread.

Study author Dr Mark Morris, based at the University of Wolverhampton, said: "Each year the number of women whose breast cancer spreads to the brain is increasing. While we know many of the genetic changes behind breast cancer, we know very little about why the disease can spread to the brain.

"By identifying the genes that are switched off or on in breast cancers before they spread to the brain we hope to be able to develop a blood test to spot this change. There's also potential for our findings to be used as a starting point to develop treatments that might prevent the spread."

Each year almost 50,000 women are diagnosed with breast cancer in the UK and around 11,600 die from the disease.

Dr Abeer Shaaban, Chair of the NCR1 Breast Clinical Studies Group (Translational, Pathology and Functional Imaging Subgroup), said: "Tackling the problem of brain metastases is one of the greatest challenges facing breast cancer researchers. This is an intriguing new angle to explore which underlines the importance of understanding how genes are controlled as cancer grows and spreads. We're understanding more and more about cancer's biology and this is opening exciting new avenues of research that could lead to new tests and treatments."

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Notes to editors

* <http://conference.ncri.org.uk/abstracts/2014/abstracts/B175.html>
and <http://conference.ncri.org.uk/abstracts/2014/abstracts/B253.html>

About the NCR1

- The National Cancer Research Institute (NCR1) is a UK-wide partnership between the government, charity and industry. Its role is to promote cooperation in cancer research.
- NCR1 Partners are: the Association of the British Pharmaceutical Industry (ABPI); Biotechnology and Biological Sciences Research Council; Breakthrough Breast Cancer; Breast Cancer Campaign; Cancer Research UK; Children with Cancer UK; Department of Health; Economic and Social Research Council; Leukaemia & Lymphoma Research; Ludwig Institute for Cancer Research; Macmillan Cancer Support; Marie Curie Cancer Care; Medical Research Council; Northern Ireland Health and Social Care (Research & Development Office); Prostate Cancer UK; Roy Castle Lung Cancer Foundation; Scottish Government Health and Social Care Directorates (Chief Scientist Office); Tenovus; Welsh Government (National Institute for Social Care and Health Research); Worldwide Cancer Research (formerly the Association for International Cancer Research); Wellcome Trust; and Yorkshire Cancer Research.
- For more information visit www.ncri.org.uk

About the NCR1 Cancer Conference

- The National Cancer Research Institute (NCR1) Cancer Conference is the UK's major forum for showcasing the best British and international cancer research.
- The Conference offers unique opportunities for networking and sharing knowledge by bringing together world-leading experts from all cancer research disciplines.
- The tenth NCR1 Cancer Conference is taking place from 2–5 November 2014 at the BT Convention Centre in Liverpool.
- For more information visit conference.ncri.org.uk