

THREE-IN-ONE 'SUPERMOLECULE' COULD DETECT CANCER EARLY, HELP DESTROY TUMOURS AND MONITOR TREATMENT

THE SAME protein could potentially be targeted to detect precancerous breast cells; deliver radiotherapy to destroy tumours; and monitor the effectiveness of treatment, according to a Cancer Research UK study presented at the NCRI Cancer Conference in Liverpool today (Tuesday).

Oxford University scientists at the Cancer Research UK/MRC Gray Institute for Radiation Oncology and Biology showed in the laboratory that a technique monitoring high levels of a protein called γ H2AX, found in many pre-cancerous cell types including breast, lung and skin cancer, could be used to detect cancer early.

The team took microscopic images of fluorescent 'flag' molecules attached to an antibody which 'homes in' on and attaches to γ H2AX, to identify areas of DNA damage*. The fluorescent 'snap shots' of γ H2AX revealed the location of pre-cancerous breast cancer cells at a very early stage.

Professor Katherine Vallis, who led the study at the Cancer Research UK/MRC Gray Institute for Radiation Oncology and Biology at Oxford University, said: "This early research reveals that tracking this important molecule could allow us to detect DNA damage throughout the body. If larger studies confirm this, the protein could provide a new route to detect cancer at its very earliest stage – when it is easier to treat successfully."

Previously the team modified an antibody to target γ H2AX and deliver radiotherapy to breast cancer cells which contained high levels of the protein. This form of radiotherapy works by boosting DNA damage until cells can no longer repair mistakes – and die.

The results confirmed that the radioactive antibody killed breast cancer cells and slowed tumour growth.

Prof Vallis added: "We need to confirm these findings in larger studies before we know if this approach could benefit patients. But these initial results show that it may be possible to track down cells with high levels of DNA damage, and destroy them before they became cancerous.

"One day we may be able to scan the body to map out the radioactive antibodies that have attached to the γ H2AX molecule. This could also allow doctors to paint a useful picture of how effective a treatment is."

Dr Julie Sharp, Cancer Research UK's senior science information manager, said: "This important study reveals that targeting this key molecule could provide an exciting route for new ways to detect cancer at an earlier stage – and help to deliver radiotherapy and monitor its effect on tumours.

"Thousands of cancer patients in the UK, and millions worldwide, benefit from radiotherapy every year. Cancer Research UK has invested heavily in research such as this to explore new ways to improve this vital treatment."

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For media enquiries please contact Emma Rigby in the NCRI press office on 0151 239 6044 or 0151 239 6045 or, out-of-hours, the duty press officer on 07050 264 059.

Notes to Editors:

- *Please follow this link for the conference abstract
<http://www.ncri.org.uk/ncriconference/2012abstracts/abstracts/A19.html>

About the NCRI Cancer Conference

The National Cancer Research Institute (NCRI) 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 eighth annual NCRI Cancer Conference is taking place from 4–7 November 2012 at the BT Convention Centre in Liverpool. For more information visit www.ncri.org.uk/ncriconference

About the NCRI

The National Cancer Research Institute (NCRI) was established in April 2001. It is a UK-wide partnership between the government, charity and industry which promotes co-operation in cancer research among the 22 member organisations for the benefit of patients, the public and the scientific community. For more information visit www.ncri.org.uk

NCRI members are: the Association of the British Pharmaceutical Industry (ABPI); Association for International Cancer Research; 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 Directorates (Chief Scientist Office); Tenovus; The Wellcome Trust; Welsh Government (National Institute for Social Care and Health Research); and Yorkshire Cancer Research.

Oxford University's Medical Sciences Division is one of the largest biomedical research centres in Europe, with over 2,500 people involved in research and more than 2,800 students. The University is rated the best in the world for medicine, and it is home to the UK's top-ranked medical school.

www.ncri.org.uk/ncriconference

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From the genetic and molecular basis of disease to the latest advances in neuroscience, Oxford is at the forefront of medical research. It has one of the largest clinical trial portfolios in the UK and great expertise in taking discoveries from the lab into the clinic. Partnerships with the local NHS Trusts enable patients to benefit from close links between medical research and healthcare delivery.

A great strength of Oxford medicine is its long-standing network of clinical research units in Asia and Africa, enabling world-leading research on the most pressing global health challenges such as malaria, TB, HIV/AIDS and flu. Oxford is also renowned for its large-scale studies which examine the role of factors such as smoking, alcohol and diet on cancer, heart disease and other conditions.

About Cancer Research UK

- **Cancer Research UK is the world's leading cancer charity dedicated to saving lives through research**
- **The charity's groundbreaking work into the prevention, diagnosis and treatment of cancer has helped save millions of lives. This work is funded entirely by the public.**
- **Cancer Research UK has been at the heart of the progress that has already seen survival rates in the UK double in the last forty years.**
- **Cancer Research UK supports research into all aspects of cancer through the work of over 4,000 scientists, doctors and nurses.**
- **Together with its partners and supporters, Cancer Research UK's vision is to beat cancer.**

For further information about Cancer Research UK's work or to find out how to support the charity, please call 0300 123 1861 or visit www.cancerresearchuk.org. Follow us on [Twitter](#) and [Facebook](#)

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