**Ref: 15/58** **13 April 2015**

**STRICT EMBARGO: 17.00 (British Summer Time)**
**Monday 13 April 2015**

# Promising developments in tackling resistance to blood cancer drugs

A new drug with the potential to reverse resistance to immunotherapy has been developed by scientists at the University of Southampton. It has shown great promise in pre-clinical models and will be available to patients with certain leukaemias and non-Hodgkin lymphomas in clinical trials later this year.

Targeted drugs made from engineered immune proteins – called monoclonal antibodies – have revolutionised treatment for several types of cancer in recent years. They work by sticking to specific proteins found on the surface of cancer cells, flagging them up to be killed by the immune system. Unfortunately, a number of patients do not respond or develop resistance to treatment.

The findings, published online today (13 April 2015) in the journal *Cancer Cell*, show that resistance to many types of antibody drugs can be overcome by preventing cancer cells from 'hiding' from immune cells. The research was carried out by scientists at the University of Southampton and Swedish biotech company, BioInvent International.

The researchers, who were funded by Leukaemia & Lymphoma Research and Cancer Research UK, have shown that some cancer cells are able to draw monoclonal antibodies inside themselves, making them invisible to immune cells. However, the researchers showed that a new antibody, called BI-1206, can effectively prevent this drug destruction process and enhance cancer killing by binding to a molecule called FcγRIIB.

BI-1206 showed remarkable success in mice in overcoming resistance to monoclonal antibodies like rituximab, currently used to treat different types of lymphoma and leukaemia.

The study, led by Dr Ali Roghanian and Professor Mark Cragg in Southampton and Dr Ingrid Teige and Professor Björn Frendéus in

Sweden, represents a six year endeavour into how to improve antibody therapeutics for blood cancers.

Professor Cragg, Professor of Experimental Cancer Research at the University of Southampton, said**:** "With more monoclonal antibody treatments being developed, there is an urgent need to understand how tumours become resistant to them and develop ways to overcome it. Not only does BI-1206 appear to be able to reverse resistance to a range of monoclonal antibodies, it is also effective at directly killing cancer cells itself."

The new drug will now be tested in patients with chronic lymphocytic leukaemia and non-Hodgkin lymphoma in an early stage clinical trial. The trial will test safety in humans and if it has any anti-cancer effects when combined with rituximab. This is a new collaborative venture between Leukaemia & Lymphoma Research, Cancer Research UK and its development and commercialisation arm Cancer Research Technology, aimed at accelerating the delivery of promising new treatments into blood cancers.

Professor Chris Bunce, Research Director at Leukaemia & Lymphoma Research, said: "Targeted drugs, like monoclonal antibodies, have shown great promise in recent years in effectively treating a patient's disease while minimising side effects. BI-1206 could have a real impact on survival for a significant number of patients."

Björn Frendéus, Ph.D., Chief Scientific Officer of BioInvent, and honorary Professor at the University of Southampton, said: "BI-1206 binds very specifically to the inhibitory FcyRIIB, a receptor that acts as a brake to dampen critical anti-cancer immune cell's function and to eliminate therapeutic antibody from the targeted tumor cell surface."

Emma Smith, senior science information officer at Cancer Research UK, said: "This exciting research has the potential to be a game-changer for people with white blood cell cancers that don't respond, or have stopped responding, to treatments like rituximab. It could also make immunotherapy for other types of cancer more effective too.

"The work was carried out in mice, so we'll have to wait for the results from clinical trials to find out if the treatment is safe and effective in people, but it's certainly a promising approach and could lead to more potent drug combinations that benefit patients."

**Ends**

For further information, please contact Henry Winter at Leukaemia & Lymphoma Research Press Office on 020 7504 2219, 07824 375880 or email: hwinter@beatingbloodcancers.org.uk

## NOTES TO EDITORS

The research is published online in the journal **Cancer Cell** under the title '*Antagonistic human FcγRIIB (CD32B) antibodies have anti-tumor activity and overcome resistance to antibody therapy in vivo*'. Corresponding author: Professor Mark Cragg, University of Southampton

## Additional information

BI-1206 is referred to in the Cancer Cell paper as 6G11

Since its introduction, rituximab has increased survival in follicular lymphoma (FL) and diffuse large cell B cell lymphoma (DLBCL) but has had more limited success in treating chronic lymphocytic leukaemia (CLL) and mantle cell lymphoma (MCL).

## About Leukaemia & Lymphoma Research

Leukaemia & Lymphoma Research is a leading UK charity dedicated to improving the lives of patients with all types of blood cancer, including leukaemia, lymphoma and myeloma. Its life-saving work is focused on finding causes, improving diagnosis and treatments, and running groundbreaking clinical trials for all blood cancer patients.

The charity champions patients' needs by influencing relevant policy and decision makers. Its communities give blood cancer patients and their families a place where they can find support and information and share their journey with other people who can relate to what they are going through.

Around 38,000 people of all ages, from children to adults, are diagnosed with blood cancers and related disorders every year in the UK. For more information visit beatingbloodcancers.org.uk

**About BioInvent**

BioInvent International AB is a research-based pharmaceutical company focused on discovery and development of innovative antibody-based drugs against cancer.
The company has unique expertise in antibody drug development from initial concept to late clinical phase. The screening tool F.I.R.S.T.™ and the antibody library n-CoDeR® are two patented tools that enable identification of relevant human antibodies and disease targets during the discovery phase. The scope and strength of this platform is also used to develop antibody-based drugs in collaboration with partners who finance the development of the new drug, and provide BioInvent the right to milestone payments and royalties on sales. These partners include Bayer Pharma, Daiichi Sankyo, Mitsubishi Tanabe Pharma, Servier and Xoma. More information is available at www.bioinvent.com.

**About the University of Southampton**

Through world-leading research and enterprise activities, the University of Southampton connects with businesses to create real-world solutions to global issues. Through its educational offering, it works with partners around the world to offer relevant, flexible education, which trains students for jobs not even thought of. This connectivity is what sets Southampton apart from the rest; we make connections and change the world.
http://www.southampton.ac.uk/
http://www.southampton.ac.uk/weareconnected
#weareconnected

**The cure for cancer? You're it**

The University of Southampton has launched a campaign to raise £25m to open the UK's first dedicated Centre for Cancer Immunology. Find out more about it at www.southampton.ac.uk/youreit

**About Cancer Research UK**

- Cancer Research UK is the world's leading cancer charity dedicated to saving lives through research.
- Cancer Research UK's pioneering work into the prevention, diagnosis and treatment of cancer has helped save millions of lives.
- Cancer Research UK receives no government funding for its life-saving research. Every step it makes towards beating cancer relies on every pound donated.
- 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.
- Today, 2 in 4 people survive cancer for at least 10 years. Cancer Research UK's ambition is to accelerate progress so that 3 in 4 people will survive cancer within the next 20 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 bring forward the day when all cancers are cured.

For further information about Cancer Research UK's work or to find out how to support the charity, please call 0300 123 1022 or visit www.cancerresearchuk.org. Follow us on Twitter and Facebook.