

HEAT-ACTIVATED ‘GRENADE’ TO TARGET CANCER

RESEARCHERS have developed cancer drug-packed ‘grenades’ armed with heat sensitive triggers, allowing for treatment to be targeted directly at tumours, according to two studies due to be presented at the National Cancer Research Institute (NCRI) Cancer Conference in Liverpool.

The team based at the University of Manchester has been developing liposomes – small, bubble-like structures built out of cell membrane that are used as packages to deliver molecules into cells – to carry drugs into cancer cells. The challenge, as with any treatment, is to direct the liposomes and their payload directly to tumours while sparing healthy tissue.

Two new studies show the team has taken a step closer to solving this problem by fitting liposomes with a heat-activated trigger. By slightly heating tumours in the lab and in mouse models*, the researchers have been able to control when the pin is pulled so that the cancer-killing ‘grenades’ release the drug and target the cancer.

Kostas Kostarelos, study author and professor of nanomedicine at the University of Manchester, said: “Temperature-sensitive liposomes have the potential to travel safely around the body while carrying your cancer drug of choice. Once they reach a ‘hotspot’ of warmed-up cancer cells, the pin is effectively pulled and the drugs are released. This allows us to more effectively transport drugs to tumours, and should reduce collateral damage to healthy cells.

“The thermal trigger is set to 42 degrees Celsius, which is just a few degrees warmer than normal body temperature. Although this work has only been done in the lab so far, there are a number of ways we could potentially heat cancer cells in patients – depending on the tumour type – some of which are already in clinical use.”

Prof Charles Swanton, Chair of the 2015 NCRI Cancer Conference, said: “Liposomes are small bubbles of cell membrane that act like a cellular postal service, delivering molecules to our cells. Using them to deliver cancer medicines has been a holy grail of nanomedicine. But finding ways to accurately direct the liposomes towards tumours has been a major challenge in targeted drug delivery.

“These studies demonstrate for the first time how they can be built to include a temperature control, which could open up a range of new treatment avenues. This is still early work but these liposomes could be an effective way of targeting treatment towards cancer cells while leaving healthy cells unharmed.”

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For media enquiries please contact Greg Jones on 0151 707 4642/43/44/45/46 or, out-of-hours, the duty press officer on 07050 264 059

Notes to Editors:

The NCRI Cancer Conference runs from 1 - 4 November, 2015.

Abstract details:

<http://abstracts.ncri.org.uk/abstract/enhanced-in-vivo-tumour-accumulation-of-antibody-targeted-temperature-sensitive-liposomes-by-local-heat-activation-2/>

And:

<http://abstracts.ncri.org.uk/abstract/triggered-doxorubicin-release-in-solid-tumours-in-vivo-from-lipid-zipper-peptide-hybrid-thermosensitive-vesicles-2/>

*The researchers used warm water baths and heating pads, but also suggest the use of metallic probes or focused ultrasound in the clinic.

NCRI Press Office

Angel Building
407 St John Street
London EC1V 4AD

T: +44 (0)20 3469 8300

T: +44 (0)7050 264 059

(out of hours)

E: press@ncri.org.uk

www.ncri.org.uk



About the NCRI

The National Cancer Research Institute (NCRI) was established in 2001. It is a UK-wide partnership between cancer research funders which promotes collaboration in the field. Its member organisations work together to maximise the value and benefits of cancer research for patients and the public.

NCRI members are: Biotechnology and Biological Sciences Research Council; Bloodwise (formerly Leukaemia & Lymphoma Research); Breast Cancer Now; Cancer Research UK; Children with Cancer UK, Department of Health; Economic and Social Research Council; Macmillan Cancer Support; Marie Curie; Medical Research Council; Northern Ireland Health and Social Care Public Health Agency (Research & Development Department); Prostate Cancer UK; Roy Castle Lung Cancer Foundation; Scottish Government Health Directorates (Chief Scientist Office); Tenovus Cancer Care; The Wellcome Trust; Welsh Assembly Government (Health and Care Research Wales); and Worldwide Cancer Research (formerly AICR).

For more information visit www.ncri.org.uk

About the NCRI Cancer Conference

The 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 NCRI Cancer Conference is taking place from 1–4 November 2015 at the BT Convention Centre in Liverpool.
- For more information visit conference.ncri.org.uk

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