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Media Statement

TROJAN HORSE MOLECULE TO COMBAT PANCREATIC CANCER

A West Australian research team has developed a Trojan horse-style molecule that homes in on a type of pancreatic tumour, opening the gates for the body's powerful immune system to attack the cancer.

Led by Professor Ruth Ganss, the group at the Western Australian Institute for Medical Research (WAIMR) has harnessed lipid-nanotechnology to package a potent inflammatory agent that, when unleashed, attracts millions of immune cells to disable the tumour.

The research will be published in *The Journal of Immunology* on July 15.

Professor Ganss said the laboratory-tested process was unique in harnessing the body's own immune system to fight internal tumours, improving survival rates.

"What we've been able to do is to create a homing device for this known inflammatory agent so that we can, for the first time, send it straight to the tumour site without affecting other parts of the body," she said.

"This process avoids toxic side effects and allows us to kickstart the immune system – a natural defence mechanism – which is very powerful when focused on the tumour.

"The trigger for the immune system is the inflammatory agent that locks onto the tumour and inflames the area, something similar to what happens when you experience a rash on your skin, so immune cells come running to fight the infection.

"We've seen the immune system combat pancreatic endocrine tumours well using this process in preclinical models, and we hope our discovery will pave the way for improved treatments for people diagnosed with this aggressive cancer."

Professor Ganss and other research groups have previously shown that in experimental models the injection of this inflammatory agent into tumours growing directly under the skin has a potent impact, but her new work offers an improved technique that pinpoints tumours deep within organs by using lipid vesicles.

The creation of new, small molecules to deliver a substance into the body is a known as nanotechnology and is a growing area of research, often used in medical imaging to view tumors.

"We've used lipid vesicles to create the new Trojan horse-molecule; once we knew the inflammatory agent could help shrink tumours, we packed it into a lipid, which is then covered with special peptides known as RGR," Professor Ganss said.

"The RGR peptides act like a homing address, taking the molecule straight to the abnormally structured blood vessels found in this type of pancreatic tumour.

"These peptides seem to have a unique connection with pancreatic endocrine tumours so, in order to carry this concept across to other types of tumours and cancer in humans, more work is needed to identify separate homing peptides."

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This recent work of Professor Ganss' team is based on a substantial body of work related to this inflammatory agent's potential in tumour treatment, published in a 2004 edition of *The Journal of Immunology*.

In 2008, *Nature* published details of the group's groundbreaking discovery that the gene RGS5 can reverse angiogenesis – the growth of blood vessels inside cancerous tumours – and that, removal of the gene could change the tumour environment in a way that improves immune cell entry so tumours can be destroyed.

This latest discovery was made possible through collaborations with Australian National University's Dr Joe Altin and Professor Chris Parish in Canberra, and funding from the Medical Research Foundation at Royal Perth Hospital, National Health and Medical Research Council, and Cancer Council Western Australia.

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