



HARRY PERKINS INSTITUTE  
OF MEDICAL RESEARCH

## New drug that breaks down the 'barbed wire' around some cancers

Perth researchers discover way to enhance immune response and drug treatment of stiff, difficult-to-treat solid cancers

Some solid tumours are so stiff they make a cracking noise when they are cut by researchers on the laboratory bench.

The fibrous nature of liver, pancreatic and some breast cancers make them difficult to treat. However, five years of research by a team of Perth scientists has resulted in the development of a novel, non-toxic agent that can deliver drugs to the cancer cells embedded in the fibrous matrix.

Research published in EMBO Molecular Medicine showed a non-toxic therapeutic agent boosted immune cells to selectively remove the fibrous scar tissue allowing cancer treatments to reach their target.

Dr Juliana Hamzah, head of the Targeted Drug Delivery, Imaging and Therapy Laboratory at the Harry Perkins Institute of Medical Research said by breaking down the fibrous matrix of stiff tumours the patient's own immune system paved the way for drug treatments to take effect.

"The cancer is like a wound, and a way that our body tries to repair the wound is to grow a scar tissue around it, but that scar tissue makes it very difficult to get to the cancer cells to destroy them.

"It is stiff, non-cellular, has very few blood vessels and impenetrable. The scar tissue is not only a physical barrier but it constricts blood vessels which are key pathways for delivering cancer treatment.

"The barrier around some cancers, such as liver cancer, pancreatic cancer and some breast cancers is like barbed wire.

"We have developed a non-toxic agent that does not affect surrounding healthy tissue.

"The agent activates immune cells to release enzymes that digest the scar tissue. This allows more cancer killing immune cells to enter the tumour. Our results show that removal of the fibrous tissue dramatically eliminates the drug delivery barrier.

"Tumours treated with the drug we've developed are more permeable to anti-tumour immune cells and cancer treatments", Dr Hamzah said.

The research data have been validated in four laboratories including the Harry Perkins Institute of Medical Research in Perth, the School of Engineering at The University of Western Australia, Sanford Burnham Prebys Medical Discovery Institute, California, USA, and the University California Davis, California, USA.

Dr Hamzah says that now the drug has been proven to have a positive impact on fibrosis, or scar tissue, she is investigating whether it can be used to prevent malignant cancer by treating the early stages of fibrosis in liver cancer.

"If you take liver cancer, it doesn't start immediately as cancer, it starts as fibrosis, cirrhosis, which then develops into liver cancer.

"Because chronic tissue fibrosis can lead to cancer we aim to investigate whether early treatment with our drug of the pre-cancerous stage, such as liver fibrosis, could prevent development of malignant cancer.

Testing of the drug is due to commence using human tissue biopsies.

#### **Contacts**

Alicia Bienkowski

08 6151 0726

mailto: [media@perkins.org.au](mailto:media@perkins.org.au)