

WORK ON BLOOD TEST FOR EARLY DETECTION OF CANCER


Researchers at WUR and the University of Twente are working on a new method of blood testing for cancer. Analysing a single drop of blood may be enough in the future to detect cancers at an early stage.

Cells communicate with one another using small sac-like particles known as extracellular vesicles (EVs). Tumour cells secrete them too; they are then known as tumour-derived extracellular vesicles (tdEVs). 'We know from previous studies that the number of tumour-derived vesicles in the blood is related to the patient's chance of survival,' explains Pepijn Beekman, a PhD candidate in Organic Chemistry. 'So that makes them an interesting subject for diagnostic tests and monitoring the effect of a treatment.' Beekman and the Twente PhD student Agustin Enciso-Martinez have now developed a chip that detects tdEVs.

'There are already tests that detect cancer via the blood by looking for cancer cells or the DNA of cancer cells,' continues Beekman. 'But detection is difficult, especially in the early stages. The concentration of cancer cells is very low then so you need a lot more blood to find a cancer cell.' He thinks that tumour-derived vesicles could offer a solution here as they are present in much greater numbers. 'Then you can get an awful lot of information out of one drop of blood. Except the existing analytical methods weren't up to it. That's because blood contains many other tiny particles and it was difficult to pick out the tumour vesicles.'

The new method solves that problem. The researchers used a chip with antibodies that, like jigsaw pieces, only fit onto tumour vesicles. They tested the method on tumour vesicles from prostate cancer

cells. The vesicles are too small to see with an ordinary microscope so they used other analysis methods, such as Raman spectroscopy, to get very detailed information about the tumour vesicles. Combining different analysis methods let them discover the tumour vesicle's unique fingerprint. They can now use that information to develop diagnostic tests.

Beekman: 'We hope eventually to have a test that will only require one drop of blood. Then you can see whether someone has cancer before the tumour becomes visible on scans.' But it will be at least another five years before they can run the first clinical trials.  **TL**