

Developing a urine test for various types of cancer

February 1 2018, by Wiebe Van Der Veen

Detecting cancer of various types, in a very early stage and using a simple urine sample. That is the ambition of the new startup company NanoMed Diagnostics. Years of research, by scientists of the University of Twente and the VU University Medical Center Amsterdam (VUmc) led to a new approach using nanotechnology. Together with the new company, the researchers will further develop this towards a test that is ready for clinical use.

Early detection of [cancer](#) can really make the difference, in survival rates and in the duration and cost of necessary treatment. In practice, patients go to their doctor at the moment they have complaints or pain. In many cases, this is too late. The current approaches for early diagnostics are often limited to one single type of cancer. Can we develop a non-invasive [test](#) on fingerprints of various types of cancer 'in one run,' is the question for many researchers worldwide. Recently, American scientists published a blood test for several types of cancer, for example.

At the University of Twente and the VUmc, researchers have worked on early cancer diagnostics for some years now. Albert van den Berg (UT/MESA+) and former VUmc-oncologist Bob Pinedo originally had an idea for a patient-friendly test on [colon cancer](#). The nanotechnology behind this test can now serve as the basis for a [urine](#) test, for more than one cancer type. For accelerating these developments, the researchers closely cooperate with the new company. A group of investors, together with the Netherlands Enterprise Agency (RVO), make this possible.

The urine test analyses DNA fragments that are 'hyper-methylated': at certain locations of the DNA, methyl groups are attached. These are fingerprints for cancer, including its location in the body. The fact that you can detect bladder cancer in a urine sample may seem self-explanatory, but detecting cervical cancer is also possible. Moreover, there are strong indications that lung cancer leaves early traces in urine as well. Further research has to prove the clinical applicability of the test. For a start, four types of cancer will be examined: [bladder cancer](#), [cervical cancer](#), [lung cancer](#) and colon cancer.

The hyper methylated DNA fragments are extracted from urine using a structure of 'nano pillars.' The next step is unraveling the fragments and detecting fingerprints. This is another step that can be miniaturized to micro or even nano scale. The UT scientists of the MESA+ Institute for Nanotechnology are experts in this, while their VUmc colleagues link the technology to medical expertise and clinical relevance: can we really distinguish healthy persons from persons with a higher risk and actual patients? NanoMed and the scientific partners expect that it takes about four years to have reliable and validated tests ready for the international markets.

Provided by University of Twente

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