

New research detects kidney cancer

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New research shows the possibility to detect kidney cancer with a simple blood or urine test. This paves the way for screening, and might help to determine which treatment works. The study is now published in *Cell Reports*.

The pioneering research on [kidney cancer](#) was performed by Francesco Gatto, a bioinformatician at the Department of Biology and Biological Engineering, in collaboration with Swedish and Italian hospitals. The prestigious journal *Cell Reports* published his results on Thursday.

"These [biomarkers](#) that we found give a whole new range of possibilities in diagnostics and [treatment](#). If you could screen patients and detect cancer at an early stage, you can simply remove the tumor surgically. But one must of course be very careful – we need to be absolutely sure that the tests give an accurate diagnosis," Francesco Gatto says.

The blood or [urine samples](#) use glycosaminoglycans, a specific family of carbohydrates, as biomarkers. Francesco Gatto discovered early during his PhD that kidney cancer cells regulate the production of these carbohydrates in an unusual way. Tests done in collaboration with an Italian clinic showed that it was true – sensible differences in glycosaminoglycan levels appeared in the blood and urine of healthy and sick subjects. The next step was to design a score, to integrate 18 different glycosaminoglycan measurements. Sick patients scored high on all accounts.

Cooperation with Sahlgrenska University Hospital enabled the collection

and testing of a larger number of samples. These also showed promising results: The biomarkers predicted the correct diagnosis in 93.7 percent of urine samples, and 100 percent of blood samples.

Francesco Gatto explains that the measurement of biomarkers may be a way to determine a suitable treatment for each patient, which can be absolutely vital.

"One patient's kidney cancer does not respond to treatment in the same way as in another patient. Physicians have no way of monitoring constantly how the treatment is working. Perhaps we can measure the biomarkers and find out if the score decreases, or if we need to change therapy," he says.

There is also the risk of removing a perfectly healthy kidney: Today, kidneys are surgically removed at the slightest suspicion of cancer, but 20 percent of those who underwent surgery turned out to have a benign tumor when the kidney is examined by the pathologists.

"We are now trying to establish at which stage we can detect an increase in biomarkers – how small can the tumor be in order for us to detect it? In the future, perhaps it will make sense to, for instance, screen people at high risk for kidney cancer," says Francesco Gatto, who is now continuing his research at Chalmers.

Provided by Chalmers University of Technology

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