

Diagnosing cancer by means of a simple blood test

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Results obtained with the aid of a new blood test suggest that it will be possible in the near future to detect eight different cancers in their early stages, which could significantly improve the treatment of these diseases.

EARLY DETECTION

Most cancers evolve insidiously over several decades (20-30 years) before reaching a stage sufficiently advanced as to provoke clinical symptoms. This is an important problem because existing anticancer treatments are generally much more effective when they are employed against immature tumors and the early detection of these tumors could thus greatly improve the patient's chances of survival. It is also for this reason that considerable effort has gone into early detection of certain common cancers, like those of breast (by mammography), colon (colonoscopy) and even cervix (Pap test).

Despite the utility of these procedures, blood is undoubtedly the tissue which offers the greatest advantages for detecting a cancer in the early stages of development because it is abundant, easy to obtain and can be rapidly analyzed. This approach is even more interesting because several studies have shown that cancer cells can circulate in the blood even before the tumor can be detected, thus opening the door towards a rapid and early diagnosis of the cancer.

NEW DIAGNOSTIC TEST

Over the past few years this approach has been explored by several research groups, but with limited success. Tests which measure certain proteins released by tumors during growth, or else based on the detection of DNA sequences specific to cancer cells, have been developed but the results obtained by these methods were not sufficiently reliable as to be used routinely.

To pare these limitations, a group of scientists had the idea of combining the two approaches, i.e. to measure the blood levels of certain proteins derived from cancer cells and, in parallel, to detect the presence of cancerous mutations in the DNA fragments released into the circulation by the tumors¹.

This new approach, called CancerSEEK, was then applied to the detection of 8 types of cancers originating in the lung, stomach, breast, colon, pancreas, liver, ovaries and esophagus. By analyzing blood samples from 1,005 people who had been diagnosed with one or another of these cancers, the research group demonstrated that the test was able to detect the presence of these diseases in 70% of cases on average, a success rate which even reached 98%



for cancers of the ovaries and liver. Another strong point of the test was that it seemed to be very specific: by analyzing the blood of 812 individuals who had not been diagnosed with cancer, the test gave false positive results for only 7 of them, i.e. less than 1%.

IMPROVE THE SENSITIVITY

These results are very exciting but the test must certainly be improved if it is to be used for detecting cancers in their first stages of development. The researchers noted that they'd had a success rate on average of only 43% for cancers which were in stage I, which is far too weak. In contrast, this approach clearly does have potential because for one of the stage I cancers tested in the study (liver) the success rate was 100%.

It is thus possible to envision the detection of several cancers by blood test becoming part of the therapeutic arsenal in the near future. This will permit not only detection of the presence of tumors at an early stage, but also enable us to precisely follow the tumor's evolution following anticancer treatments.

⁽¹⁾ Cohen JD et al. Detection and localization of surgically resectable cancers with a multi-analyte blood test. *Science* (2018) 359(6378):926-930.