Breakthrough blood test picks up cancer before symptoms arise

By **Sarah Knapton** SCIENCE EDITOR

A BLOOD test that not only detects cancer but also identifies where it is in the body has been developed by scientists.

The breakthrough could allow doctors to diagnose specific cancers much earlier, even before signs such as a lump begin to show.

The test is simple enough to be included in routine health checks, such as those for blood pressure and cholesterol levels.

The test, called CancerLocator, has been developed by the University of California, and works by hunting for the DNA from tumours that circulates in the blood of cancer patients.

The team discovered that tumours that arise in different parts of the body hold a distinctive "footprint" which a computer can spot.

"Non-invasive diagnosis of cancer is important, as it allows the early diagnosis of cancer, and the earlier the cancer is caught, the higher chance a patient has of beating the disease," said Professor Jasmine Zhou, co-lead author from the University of California at Los Angeles.

"We have developed a computer-driven test that can detect cancer, and also identify the type of cancer, from a single blood sample.

"The technology is in its infancy and requires further validation, but the potential benefits to patients are huge."

Around 350,000 people are diagnosed with cancer in Britain each year, and 90 per cent of them will survive most types for at least five years if it is spotted early. In contrast, only five to 15 per cent of people survive five years if cancer is picked up late. To create the test, the US team built a computer database containing specific molecular patterns that occur in tissue when tumours were present.

Some markers of DNA damage show up regardless of which cancer is present, while others are specific to the type of tissue they originated from, such as the lung or liver.

The test was checked 10 times on blood samples from 29 liver cancer patients, 12 lung cancer patients and five breast cancer patients. It picked up eight out of 10 cancers, and gave a false positive on fewer than one in 100 occasions.

Although the level of tumour DNA present in the blood is much lower during the early stages of these cancers, the programme was still able to make a diagnosis, demonstrating the potential of this method for the early detection of cancer, according to the researchers.

Prof Zhou added: "In general, the higher the fraction of tumour DNAs in blood, the more accurate the programme was at producing a diagnostic result."

The research was published in the journal *Genome Biology*.

Dr Catherine Pickworth, science information officer at Cancer Research UK, said: "This computer programme is an encouraging approach to being able to detect cancer, and identify where in the body it is located, from a patients' blood sample.

"But the study looked at just 46 patients so the next stage will be to look at the test's accuracy in larger numbers of patients, and compare it to the current best methods of diagnosing cancer."