

Cancer to be diagnosed with a drop of blood

Monday, 13 April 2009

A drop of blood or speck of tissue no bigger than a full stop could soon be all that is required to diagnose cancers and assess their response to treatment, research suggests.

New technology that allows cancer proteins to be analysed in tiny samples could spell the end of surgical biopsies, which involve removing lumps of tissue, often under general anaesthetic.

Researchers at Stanford University, California, have developed a machine that separates cancer-associated proteins by means of their electric charge, which varies according to modifications on the protein's surface.

Antibodies, immune system agents that bind to specific molecules, are then used to identify the relative amounts and positions of different proteins. The technique was able to detect varying levels of activity of common cancer genes in human lymphoma samples and even distinguish between different lymphoma types.

The researchers said that the same system could be used to monitor cancer treatment more quickly and easily. Although the study focused on blood cancers, scientists also hope to apply the technique to solid tumours and are currently testing the technique on head and neck tumours.

Dean Felsher, from the university, said: "Not only can we detect picogram levels — one trillionth of a gram — of protein, but we can also see very subtle changes in the ways the protein is modified."

The researchers, who reported their findings online in the journal *Nature Medicine*, were able to confirm the anti-cancer effect of a cholesterol-reducing statin drug on one lymphoma patient. "This is the first time we have been able to see that this compound affects the biology of cancer cells in patients," Dr Felsher said.

Alice Fan, a clinical instructor in the division of oncology at Stanford's medical school, said it could be a real advance in rapid tracking of tumour cells during treatment. "The standard way we measure if a treatment is working is to wait several weeks to see if the tumour mass shrinks. It would really be a leap forward if we could detect what is happening at a cellular level."

The scientists found that the technique worked on lymphoma samples drawn from laboratory mice as well as on cultured tumour cells.

The researchers were able to detect varying levels of two common oncogenes — a gene that, when mutated or found at high levels, helps to turn a cell cancerous — in 44 of 49 human lymphoma samples. But they said more research was needed before the technology became widely available. //04.13.09 Mina