

## **Gene clue to leukaemia progress (BBC NEWS)**

**Taking a snapshot of gene activity can help doctors gauge how well leukaemia patients are likely to respond to treatment.**

Scientists have found that certain genes play a key role.

Tests have shown the technique out-performs other diagnostic methods, such as taking a blood cell count.

The research, by Dana-Faber Cancer Institute and the University "La Sapienza" in Rome, is published in the journal Blood.

The scientists used "gene expression analysis" to measure the degree of activity in thousands of genes in 33 patients who had been recently diagnosed with adult T cell acute lymphocytic leukaemia (T-ALL).

The disease is caused by the overproduction of immune cells known as T lymphocytes.

### **Differing responses**

Around seven out of ten children who develop the disease respond very well to chemotherapy drugs.

However, the success rate among adults is much less high.

Using a technique called micro array analysis, the researchers compared gene activity levels among patients who did respond to chemotherapy and those who did not.

They found a single gene - IL-8 - that was unusually active in patients whose condition was resistant to drugs.

They also found a group of 30 genes that were highly expressed in leukaemic cells from patients who had complete remissions of the disease.

By measuring the expression levels of three of those genes - AHNAK, TTK, and CD2 - researchers were able to correctly predict the duration of remission in 71% of the cases.

Using more conventional methods to predict outcome, such as measuring the white blood cell count and comparing the similarities between normal and cancerous cells, proved to be less accurate.

### **Great potential**

The researchers say their work may help doctors adjust treatments based on patients' individual gene-expression profile.

Further study of these genes may also lead to therapies that target specific genetic abnormalities in adult T-ALL patients.

Ken Campbell, of the Leukaemia Research Fund, told BBC News Online: "As far as we are aware this is the first example of use of micro array technology to identify a gene which predicts that a patient's disease will not respond to chemotherapy.

"This has obvious clinical value but may also guide the way to developing new treatments which will block the action of this gene and restore the response to chemotherapy.

"The report that a complex of 3 genes predicts likely outcome is also consistent with earlier results on patients with lymphoma (a related condition).

"Again, this will not only help doctors to determine which patients need most intensive therapy but will help to guide future research."

The Leukaemia Research Fund has established a micro array facility at Cambridge University.

### **General application**

Professor Vaskar Saha, head of Cancer Research UK's children's cancer group, said a problem with current treatments for many types of cancer was that doctors do not know how a person will respond until later.

Thus all patients are initially offered the same treatment.

"This means that for those in whom the disease does not respond satisfactorily, not only has time been wasted but they have also been exposed to unnecessary toxicity.

"Gene expression arrays, as described in this paper, performed at diagnosis have shown that it is possible to identify those who will benefit from those who will not prior to starting treatment.

"More excitingly, they also possess the potential of identifying novel biological mechanisms which lead to drug resistance.

"This in turn will pave the way for newer approaches to those who are currently incurable using conventional methods of treatment."