

New approach to assessing effectiveness of anti-cancer drugs

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Manchester scientists have developed a new method to monitor the effect of anti-cancer drugs on very rare leukaemia stem cells. The approach potentially allows doctors to screen patients and personalise their treatment.

The recent development of novel agents has improved outcomes for patients with chronic myeloid leukaemia (CML). These so-called [tyrosine kinase inhibitors](#) (TKIs) target abnormal proteins caused by commonly found genetic mutations in CML patients. However, the existence of treatment-resistant [cancer stem cells](#) - cells that are able to repeatedly renew the leukaemia cell population - is one way that many patients experience disease recurrence when treatment stops.

Any new [drug](#) must therefore be tested on such stem cells, but unfortunately they are only found in very low numbers and are identified by certain cell surface markers. Now researchers at The University of Manchester - part of the Manchester Cancer Research Centre - have tested a way to monitor the effect of drugs on small samples of cells.

Professor Tony Whetton, head of the Stem Cell and Leukaemia Proteomics Laboratory who led the study, said: "Current techniques require greater numbers of cells in order to detect changes caused by TKIs. Our study investigated the potential of a new technology platform that can identify changes in very small cell numbers."

The research team looked at an antibody-based approach to detect

structural changes in certain proteins, in order to track the effectiveness of the TKI drugs. The instrument used fixes proteins in place and holds them, there allowing for a better signal to be generated from less material. With this approach they found that they could record changes in samples of only a few thousand critically important but rare [stem cells](#).

"This new approach will enable us to test drugs on cells taken from patients, either at presentation or in a clinical trial setting. It has great potential to allow us to implement precision medicine, where patients receive the most appropriate treatment to target their individual tumour," added Professor Whetton.

More information: *Nature Protocols* 2015 Jan;10(1):149-68. [DOI: 10.1038/nprot.2015.007](#). Epub 2014 Dec 18.

Provided by University of Manchester

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