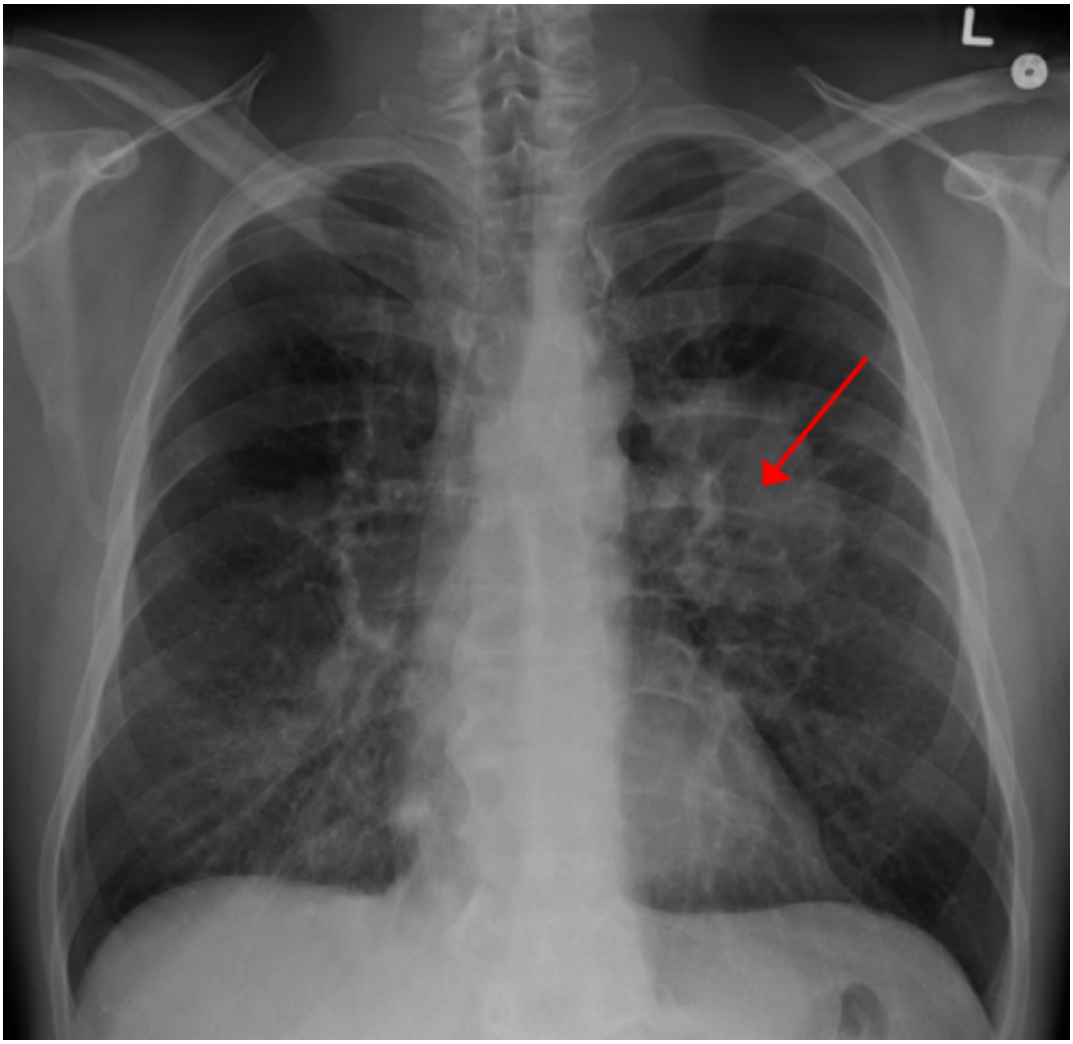
'Liquid biopsy' offers new way to track lung cancer

June 3 2014



Lung CA seen on CXR. Credit: CC BY-SA 4.0 James Heilman, MD/Wikipedia

(Medical Xpress)—Scientists have shown how a lung cancer patient's blood sample could be used to monitor and predict their response to treatment – paving the way for personalised medicine for the disease.

The recent study, published in the journal *Nature Medicine*, also offers a method to test new therapies in the lab and to better understand how tumours become resistant to drugs.

Small cell lung cancer (SCLC) is an aggressive disease with poor survival and new treatments are desperately needed. In many cases the tumour is inoperable and biopsies are difficult to obtain, giving scientists few samples with which to study the disease.

Now research carried out at Cancer Research UK's Manchester Institute, based at The University of Manchester – part of the Manchester Cancer Research Centre – has looked at the potential of using circulating tumour cells (CTCs) – cells that have broken off from the tumour and are circulating in the blood – to investigate a patient's disease in a minimally invasive manner.

The researchers, working closely with lung specialist and Medical Oncologist Dr Fiona Blackhall at The Christie NHS Foundation Trust, found that patients with SCLC had many more CTCs in a small sample of their blood than patients with other types of cancer. Importantly, the number of CTCs for each patient was related to their survival – patients with fewer CTCs in their blood lived longer.

Professor Caroline Dive, who led the study, said: "Access to sufficient tumour tissue is a major barrier to us fully understanding the biology of SCLC. This liquid biopsy is straightforward and not invasive so can be easily repeated and will allow us to study the genetics of each lung cancer patient's individual tumour. It also means that we may have a feasible way of monitoring patient response to therapy, hopefully

allowing us to personalise and tailor individual treatment plans to each patient."

In addition, the team were able to use these CTCs to grow tumour models in mice, which they termed CTC-derived explants (CDXs). When they treated these mice with the same chemotherapy drugs as the SCLC patients they showed that the CDXs responded in the same way as each donor patient.

"We can use these models to help us understand why so many SCLC patients acquire resistance to chemotherapy and to search for and test potential new targeted treatments," added Professor Dive.

More information: "Tumorigenicity and genetic profiling of circulating tumor cells in small-cell lung cancer." Cassandra L Hodgkinson, et al. *Nature Medicine* (2014) DOI: 10.1038/nm.3600. Received 17 March 2014 Accepted 16 May 2014 Published online 01 June 2014

Provided by University of Manchester