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Breakthrough in understanding lung cancer vulnerabilities points the way to new targeted therapy

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More effective treatments for one of the deadliest forms of cancer are one step closer thanks to groundbreaking research from an international collaborative study.

Scientists from the Universities of Sheffield and Cologne have identified the dependencies of multiple Small Cell Lung Cancer (SCLC) types – paving the way for clinical trials of new targeted treatments which could revolutionise the current approach.

Around 40,000 people are diagnosed annually with lung cancer in the UK, and SCLC accounts for nearly one in five of all these cases.

Unfortunately, the prognosis for SCLC patients is very bleak – two thirds of people are diagnosed in the late stages of the disease when the five year survival rate with current treatments is less than five per cent.

But now researchers have discovered that survival of SCLC cells grown from human tumours relies upon a protein called Aurora kinase. This finding, published today in the journal *Proceeding of the National Academy of Sciences* (*PNAS*), suggests that 'targeted' therapeutic strategies should focus on testing Aurora kinase inhibitors, several of which have already been developed by pharmaceutical companies.

The team also went on to show that Aurora kinase inhibitors are most

effective at killing SCLC cells when the cells have high levels of the MYC cancer gene. This predicts that these drugs might be most beneficial for SCLC patients with a MYC gene amplification, which is found in up to seven per cent of people diagnosed with SCLC.

Dr Patrick Eyers, from the University of Sheffield's Institute for Cancer Studies, said: "A major goal of modern cancer research is to discover drugs that target vulnerabilities in specific cancer patient sub-populations. Current chemotherapy for SCLC kills cancerous cells and non-cancerous cells indiscriminately and results in severe side effects.

"However, revolutionary clinical trials have recently validated 'molecularly targeted' kinase inhibitors for treating cancers such as melanoma, leukaemia and non-small cell lung cancer.

"We have been studying Aurora kinase inhibitors for several years, and the remarkable vulnerability of some SCLC-derived cells to such drugs can hopefully be rapidly confirmed by careful stratification of SCLC patients and their enrolment in new clinical trials."

Provided by University of Sheffield