New cancer drug test promises safer and more effective clinical trials

September 23 2009

A group of scientists from Hamburg may have taken a big step towards more effective cancer drug development, Europe's largest cancer congress, ECCO 15 - ESMO 34, heard today. Dr Ilona Schonn, Director of Cell Culture Research at Indivumed GmbH, told the conference that they had developed a preclinical drug test platform that would enable researchers to analyse tumour tissue for individual patient drug responses on the molecular level.

To date most tests for drug metabolism and toxicity testing have used tissue slices of normal organs like liver, kidney and lung. The new test was created specifically for oncology drug testing and uses tumour tissues from colorectal and lung cancer patients.

A major problem of drug development at present is the inability to extrapolate response in preclinical cell models to patients. "Approximately 90% of clinical trials fail because the drugs used are too ineffective or too toxic," explained Dr Schonn. "Not only does this result in unacceptably high costs for drug development, but it also exposes patients to risks from toxicity or simply wastes their time in testing a substance which proves to be ineffective."

The problem arises from the fact that patients respond individually to drugs. In addition, each tumour consists of a variety of different cancer cells that interact in different ways with the framework of individual non-tumour cells, resulting in highly variable growth behaviour and response to drugs. Dr Schonn and her team set out to try to develop a drug test

that would eliminate these problems and provide an accurate model of individual patient response.

"Based on freshly cultivated intact tissue from surgically treated cancer patients we are now able to analyse numerous tumours from different patients, to identify differences in drug response between those patients, and to understand variations of response in cell subtypes within one tumour," said Dr Schonn.

The new test allows scientists to translate findings from commonly used cell lines to a preclinical model which is as close as possible to using the same drug in the clinical setting, thus enabling a better estimate of the number of patients who are likely to respond to the treatment. It also helps to identify biomarkers that can predict drug response for patients entering a clinical trial, allowing researchers to include only those patients whose participation will provide a significant answer to the question being asked.

"Together with all the clinical patient data and several analytical test systems such as signalling pathway analysis, we have been able to characterise individual tumours in more detail. This will improve the understanding of drug effects and treatments, a step forward towards the goal of individualised cancer therapy," she said. "The test is of particular interest to pharmaceutical companies because it allows the analysis of samples from meaningful number of patients with different tumours in a short period of time, and can, therefore, accelerate progression of a potential new treatment to clinical trials."

In addition, it can help gain more knowledge about the mode of action of a new compound in patients, and identify optimal disease areas, for example tumours with particular mutations or over-expression of target receptors, and dosage.

To date the test has only been validated in colon, non small cell lung, and breast cancer tumours but there is no reason to think that it would not be equally accurate in other solid tumour types, the scientists say. "Because the test allows us to maintain the complex environment of the primary cancer tumour, we believe that it holds out great promise for the quick and effective elucidation of response to anticancer drugs," said Dr Schonn. "We hope to be able to apply it to a growing number of drugs emerging from the labs of pharmaceutical companies to help to shorten development time and to make clinical trials both more efficient and safer for patients."

Source: ECCO-the European CanCer Organisation