MedicalXpress

Genetic make-up of rare gastrointestinal tract tumour decoded

September 11 2013

Gastrointestinal stromal tumours (GIST) are relatively rare tumours of the gastrointestinal tract that can occur both as a harmless incidental finding and as aggressive, malignant disease. Two key genetic mutations that can lead to these tumours developing are already known, however it was believed that other, hitherto unknown genes, also had a role to play. Researchers at the MedUni Vienna have now successfully decoded not only individual genes, but also the entire genetic make-up of these tumours.

The working group led by Sebastian Schoppmann (University

Department of Surgery), Berthold Streubel (University Department of Gynaecology) and Peter Birner (Clinical Institute of Pathology) used the next generation sequencing technique – a technique used to identify genetic changes in genetic material – to analyse the entire genetic material ("exome") that is translated into proteins.

"One particular challenge is that these sequencing operations often flag up thousands of genetic mutations in every tumour analysed without it being clear which of them are of significance," says Birner. "By combining 'exome sequencing' with several other genetic high throughput investigation methods, however, we have been able to arrive at ten new biologically significant genes that are frequently mutated in gastrointestinal stromal tumours, and for the majority of these there has previously been no relevant data available relating to malignant diseases." It was found, for example, that mutations in the MAP kinase pathway, which is one of many involved in cell growth and programmed cell death, are much more common than previously suspected.

For three of these genes, the researchers at the MedUni Vienna have even been able to demonstrate direct clinical significance that was previously unknown. Says Birner: "Our results enable us to create completely new insights into the biology of GIST, which could in turn lead to new therapeutic approaches."

The study has now been published in *Clinical Cancer Research* and is already the second paper published by this group in this top journal in the space of twelve months.

Provided by Medical University of Vienna