Medical Xpress

'Fingerprinting' breakthrough offers improved brain tumour diagnosis

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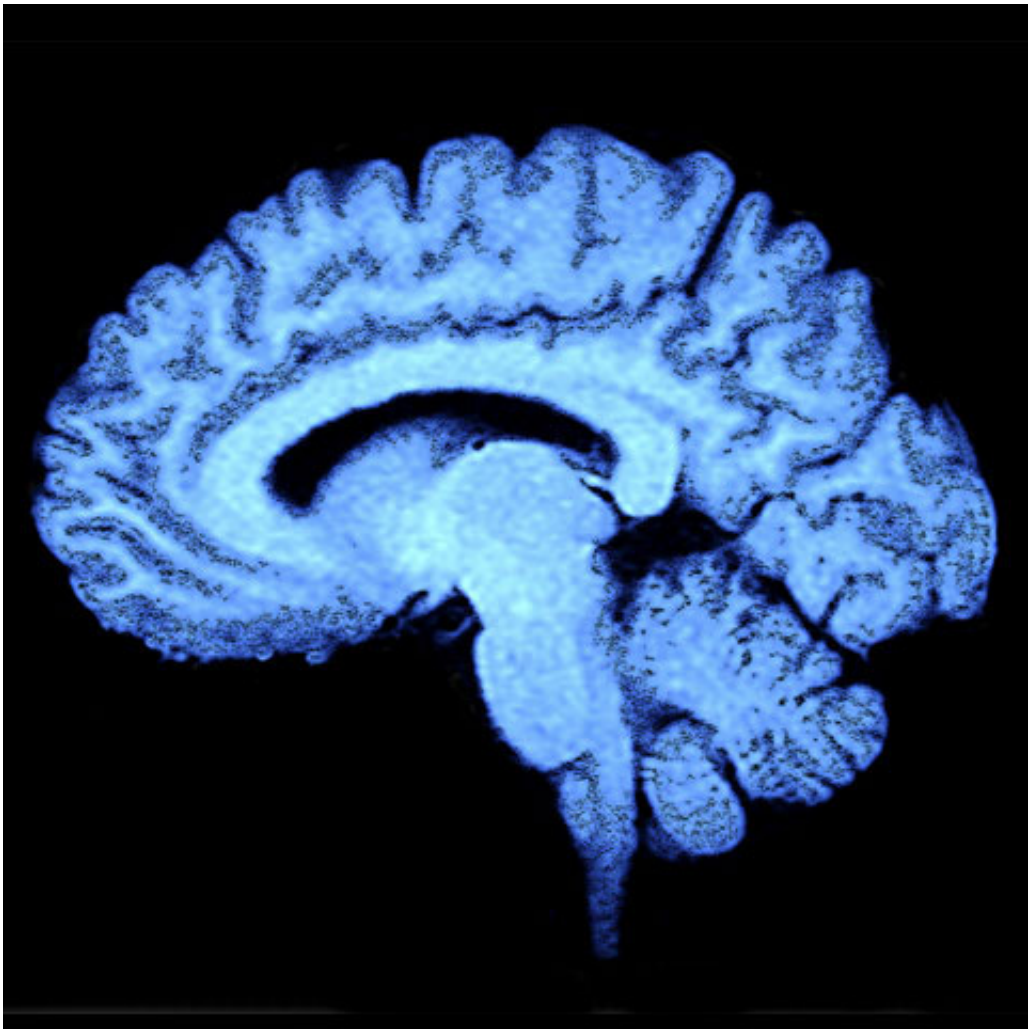

(Medical Xpress)—UK scientists have made a breakthrough in a new method of brain tumour diagnosis, offering hope to tens of thousands of people.

Researchers, led by Professor Francis Martin of Lancaster Environment Centre at Lancaster University, have shown that infrared and Raman spectroscopy – coupled with statistical analysis – can be used to tell the difference between normal brain tissue and the different tumour types that may arise in this tissue, based on its individual biochemical-cell 'fingerprint'.

Spectroscopy is a technique that allows us to analyse light interactions with samples such as tissue by generating a spectrum, which is a reflection of the interrogated sample.

Currently, when surgeons are operating to remove a brain tumour it can be difficult to spot where the tumour ends and normal tissue begins.

But new research published online in Analytical Methods this month has shown it is possible to spot the difference between diseased and normal tissue using Raman spectroscopy – a type of spectroscopy which works effectively on living tissue, giving accurate results in seconds.

This is a key development which means it is now theoretically possible to test living tissue during surgery, helping doctors to remove the complete tumour whilst preserving intact adjacent healthy tissue.

The fingerprinting technique was also able to identify whether the tumours arose in the brain or whether they were secondary cancers arising from an unknown primary site. This is a key development which could help reveal previously undetected cancer elsewhere in the body, improving patient outcomes.

Professor Francis Martin said: "These are really exciting developments which could lead to significant improvements for individual patients diagnosed with brain tumours. We and other research teams are now working towards a sensor which can be used during brain surgery to give surgeons precise information about the tumour and tissue type that they are operating on."

The information obtained by this method can be combined with conventional methods, for example immunohistochemistry, to diagnose and grade brain tumours to allow for more accurate planning and execution of surgery and/or radiation therapy.
This offers more potential for individualised treatment and better long-term survival.

More information: K Gajjar et al, *Anal. Methods*, 2012, DOI: 10.1039/c2ay25544h . pubs.rsc.org/en/content/articl … g/2012/ay/c2ay25544h

Provided by Lancaster University