

Lay Summary

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Development of a mass-spectrometry tissue classifier for rapid diagnosis of brain tumours

Prof Olaf Ansorge and Mr Chris McKinnon, University of Oxford

Brain tumours can either originate in the brain or spread there from another part of the body. These tumours can cause significant health problems and may even be life-threatening. To diagnose a brain tumour, doctors either perform surgery to remove as much of the tumour as possible or take a small sample of it for analysis. This sample is then examined by a specialist to confirm the diagnosis. This process can take anywhere from a few minutes during surgery to a few days after surgery. Without this analysis, doctors can't formulate a treatment plan.

This study aims to speed up the diagnosis process. The researchers plan to use a device called an Atmospheric Solids Analysis Probe-Mass Spectrometer (ASAP-MS), which can identify the chemical makeup of the tissue sample in about a minute. To test this approach, they'll use the device on tissue samples that have already been diagnosed. They'll then use advanced computer algorithms, often referred to as 'artificial intelligence', to find patterns in the data that match the diagnoses.

The ASAP-MS device is a small, bench-top device that gives results quickly, within 15-30 seconds. The researchers are confident that this method will work and could greatly improve how brain tumours are diagnosed. This would revolutionise near-patient diagnosis in neurosurgery and neuropathology, potentially leading to quicker treatment plans and better outcomes for patients.