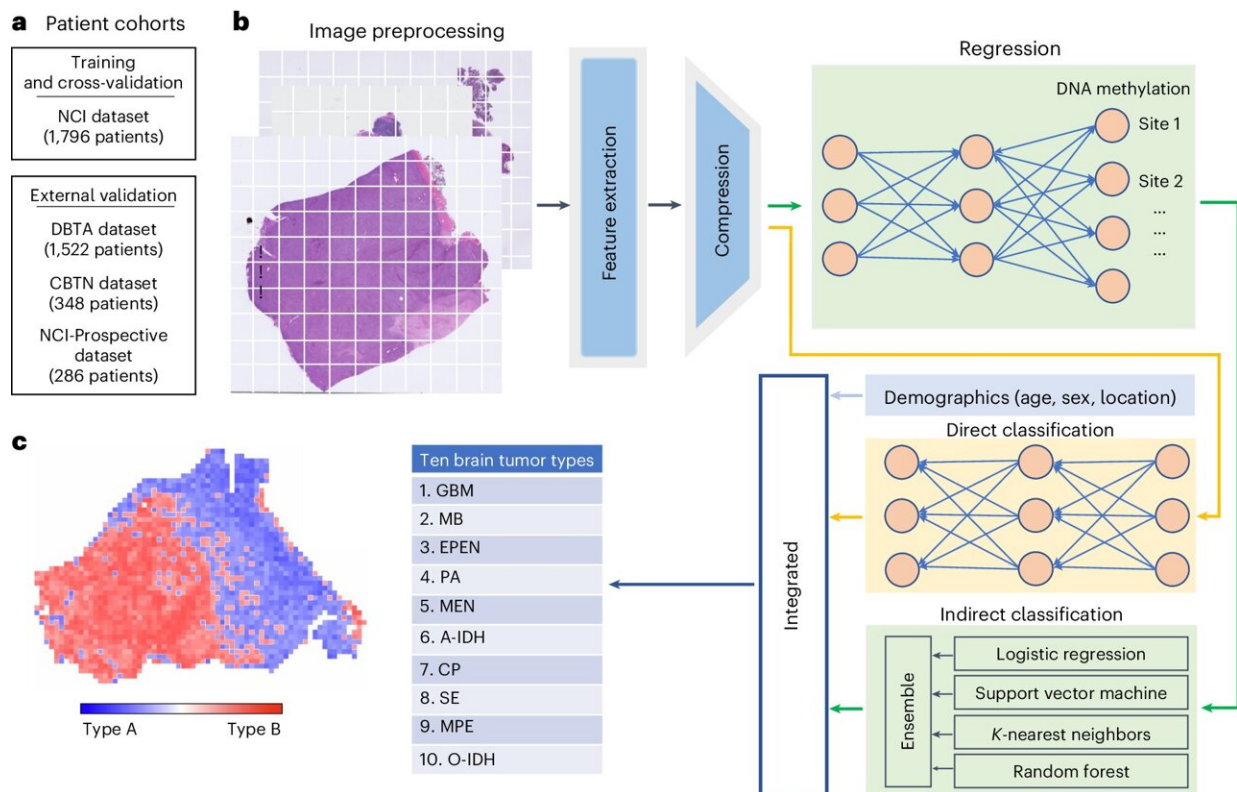


Research team develops new AI tool to help classify brain tumors

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Overview of the datasets and computational workflow. Credit: *Nature Medicine* (2024). DOI: 10.1038/s41591-024-02995-8

A new AI tool to more quickly and accurately classify brain tumors has been developed by researchers at The Australian National University (ANU).

According to Dr. Danh-Tai Hoang, precision in diagnosing and categorizing tumors is crucial for effective patient treatment.

"The current gold standard for identifying different kinds of brain tumors is DNA methylation-based profiling," Dr. Hoang said.

"DNA methylation acts like a switch to control gene activity, and which genes are turned on or off.

"But the time it takes to do this kind of testing can be a major drawback, often requiring several weeks or more when patients might be relying on quick decisions on therapies.

"There's also a lack of availability of these tests in nearly all hospitals worldwide."

To address these [challenges](#), the ANU researchers, in [collaboration](#) with [experts](#) from the National Cancer Institute in the United States (US), developed DEPLOY, a way to predict DNA methylation and subsequently classify brain tumors into 10 major subtypes.

DEPLOY draws on microscopic pictures of a patient's tissue called histopathology images.

The model was trained and validated on large datasets of approximately 4,000 patients from across the U.S. and Europe. The study is [published](#) in the journal *Nature Medicine*.

"Remarkably, DEPLOY achieved an unprecedented accuracy of 95%," Dr. Hoang said.

"Furthermore, when given a subset of 309 particularly difficult to classify samples, DEPLOY was able to provide a diagnosis that was

more clinically relevant than what was initially provided by pathologists.

"This shows the potential future role of DEPLOY as a complementary tool, adding to a pathologist's initial diagnosis, or even prompting re-evaluation in the case of disparities."

The researchers believe DEPLOY could eventually be used to help classify other types of cancer as well.

More information: Danh-Tai Hoang et al, Prediction of DNA methylation-based tumor types from histopathology in central nervous system tumors with deep learning, *Nature Medicine* (2024). [DOI: 10.1038/s41591-024-02995-8](https://doi.org/10.1038/s41591-024-02995-8)

Provided by Australian National University

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