

AI Identifies Cancer of Unknown Origin

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A machine learning model may be able to identify the origin of metastatic cancer, which could help guide treatment decisions, according to a study presented at the American Association for Cancer Research Annual Meeting in April.

When cancer spreads to the lungs, liver or other parts of the body, it can be hard to determine where it originated and how best to treat it. People with so-called cancer of unknown primary (CUP) tend to have poorer outcomes, in part because they might not receive the right treatment.

“Only between 15% and 20% of patients with CUP show features that allow physicians to treat them with site-specific therapies, which are associated with better outcomes,” said presenter Marco De Velasco, PhD, of Kindai University in Japan. “However, most patients, between 80% and 85%, receive more general chemotherapy, which is often less effective.”

Molecular profiling that analyzes patterns in tumor biology may help identify cancer types even after metastasis. De Velasco’s team focused on a chemical modification known as CpG DNA methylation. Using data from nearly 7,500 patients with known cancer origin, they developed a computational model that could distinguish among 21 different types of cancer. The model correctly identified the cancer type in about 90% of cases in two patient cohorts.

One limitation of this approach is that some tumors are not easily accessible for genetic testing. The researchers hope to adapt their model to use circulating tumor DNA in blood samples instead of tumor tissue samples from a biopsy.

“The long-term goal is to create a tool that could support physicians in identifying the likely tissue of origin and helping inform more effective treatment decisions,” De Velasco said.
