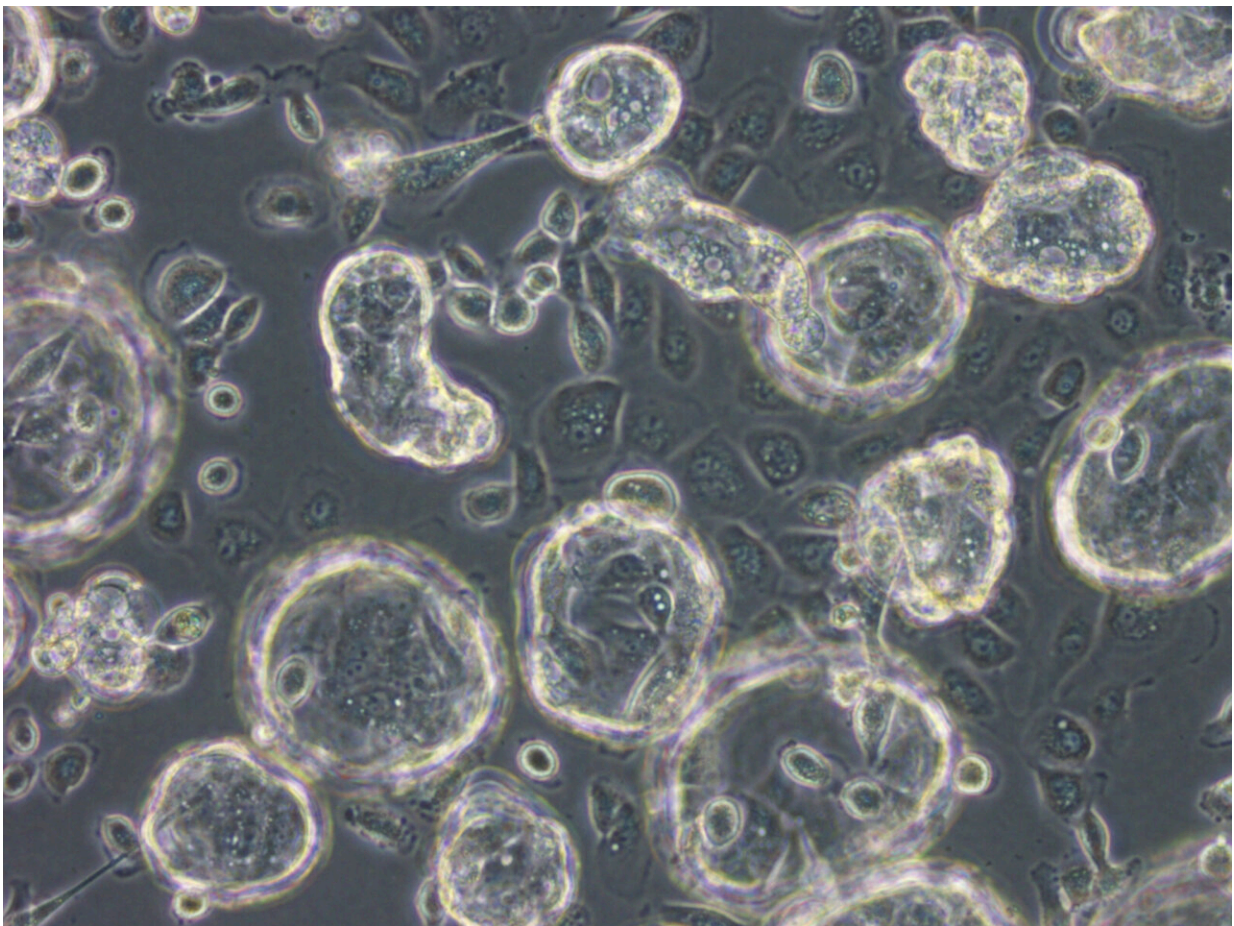


# Study demonstrates synergies of using blood-based liquid biopsies to complement tissue biopsies for lung cancer

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Lung cancer cells from liquid biopsy under a microscope. Credit: Dr Jamie Mong, Senior Scientist, Institute of Bioengineering and Bioimaging, A\*STAR

Researchers from A\*STAR's Institute of Bioengineering and Bioimaging (IBB), in collaboration with Changi General Hospital (CGH) and Lucence, a local biomedical start-up, conducted the first local prospective study which demonstrated that a blood-based liquid biopsy can be used to complement the conventional tissue biopsy for lung cancer diagnosis.

The study focuses on non-small cell lung cancer (NSCLC) and has shown that a [liquid biopsy](#) test could be used to extract [relevant information](#) for a preliminary [diagnosis](#). This would benefit some patients who have had their cancer diagnosed, allowing them to track their response to treatment, or learn whether cancer has returned, and better assess and select the most suitable treatment earlier, using evidence-based methods.

NSCLC accounts for 85 percent of all lung cancers, making it one of the most common causes of cancer death worldwide. The median age of NSCLC diagnosis is 70 years of age and approximately 40 percent of patients are diagnosed at a late stage. Such patients would benefit from the added option of liquid biopsies, which can provide additional information about the cancer that would complement tissue testing.

Tissue biopsies are a vital part of cancer care as they provide representative tissue of the actual tumor that can be assessed by pathologists in a highly accurate manner, and are used to confirm a [cancer diagnosis](#), identify the cell type of the tumor and provide predictive biomarkers of response to targeted treatments. While [tissue biopsies](#) remain the gold standard for cancer diagnosis, liquid biopsies, which are performed on [blood samples](#), are able to complement this process and provide early detection of cancer recurrence.

The liquid biopsy works by detecting mutant DNA from mutated cancer cells, which cannot be found in normal DNA. While the type of cancer

cannot be confirmed, the information from the liquid biopsy helps to detect cancer, determine the appropriate course of treatment and potentially improve time to report and time to treatment. In this study, the process from blood-based liquid biopsy to diagnosis took an average of 10 days. Turnaround time for tissue results may take longer, depending on the quantity and quality of the specimen being biopsied.

Working with a local biomedical start-up, Lucence, the team tapped on IBB's capabilities in ultrasensitive diagnostic assays and technologies and Lucence's liquid biopsy test to process the samples in a clinically accredited laboratory. IBB researchers validated the results in tumor samples and [clinical data](#) provided by CGH. The results are applicable for local hospitals and clinics. It would also be clinically impactful for local patients.

Dr. Jamie Mong, Senior Scientist at A\*STAR's IBB, said, "The aim of IBB's research is to design and develop studies to help improve diagnostics tools for patients. The findings from this collaboration with Changi General Hospital and Lucence have shown that blood-based biopsies are very useful in preliminary diagnosis of non-small cell lung cancer, and this could help to improve health outcomes for patients."

"The research study findings showed the feasibility of liquid biopsy as an additional diagnostic option for [non-small cell lung cancer](#) when tissue biopsy for lung cancer mutation testing is not viable, particularly for medically unfit patients with progression of the cancer disease. In innovating healthcare for tomorrow, CGH collaborates widely with research partners to create new value and enhance care for patients," said Clinical Associate Professor Augustine Tee, Deputy Chairman, Medical Board (Medical Disciplines) and Senior Consultant, Respiratory and Critical Care Medicine, Changi General Hospital.

"This collaborative study shows that liquid [biopsy](#) yields additional

26.8% actionable treatment options for patients, because of the limitations of conventional tissue testing," said Dr. Min-Han Tan, Founding CEO and Medical Director at Lucence. "Together with a ten day turnaround time, this means earlier and more guideline-concordant [cancer](#) treatments."

Beyond diagnosis, the blood tests can be also used to monitor a patient's condition and how receptive they are to treatment.

The research was published in *Frontiers in Medicine*.

**More information:** Yukti Choudhury et al, Complementing Tissue Testing With Plasma Mutation Profiling Improves Therapeutic Decision-Making for Patients With Lung Cancer, *Frontiers in Medicine* (2022). [DOI: 10.3389/fmed.2022.758464](https://doi.org/10.3389/fmed.2022.758464)

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