

# Can Liquid Biopsies Transform Cancer Diagnosis and Management?

In the coming decade, [liquid biopsy](#) may be a standard procedure for detecting cancer. Studies now show the potential of this minimally invasive technique as an alternative to traditional tissue biopsies, which can be painful for patients and don't always provide clinicians with a complete profile of tumors mutation.

A [recent study](#) found that “almost 90 percent of a tumor’s genetic features can be detected in blood samples,” suggesting liquid biopsies could be used not only to identify tumors but also to determine the best therapies for targeting them. In an interview, Joydeep Goswami, president of clinical next generation sequencing and oncology at Thermo Fisher Scientific, expands on the current state of liquid biopsy research and what is on the horizon.

Q: Why are leaders in the healthcare industry excited about the potential of liquid biopsies?

Joydeep Goswami: Researchers believe that liquid biopsies may enable more widespread cancer screening to increase early detection rates. Cancer outcomes often depend on early diagnosis: If cancer is discovered at an early stage, the chances of survival are better. Liquid biopsy can detect cancer before a patient develops masses large enough to spot with a CT scan and can be used to identify tumors in locations that would be inaccessible for tissue biopsy. This could not only aid with early detection but also give clinicians more advanced notice when cancer is recurring.

Additionally, since liquid biopsies are collected using a simple blood sample, they can be far less expensive, faster, easier to perform and safer for the patient than solid tissue biopsies.

Q: Are there other clinical applications besides cancer detection?

JG: Liquid biopsies may also be used to determine more targeted treatments for patients once they are diagnosed with cancer. Today, researchers are exploring whether liquid biopsies can be used to effectively manage cancer by monitoring response to treatment, detecting early signs of relapse after remission and evaluating tumor mutation.

Researchers also believe that one day we'll be able to use liquid biopsy to more specifically characterize tumor mutations, enabling clinicians to devise more personalized treatment plans. For example, precision medicine treatments that target specific [tumor pathways](#) are currently showing promise for treating certain cancer types.

Q: What innovations are helping to advance the use of liquid biopsies?

JG: Realizing the full potential of liquid biopsies requires ongoing advancement in two areas: sensitivity and speed.

Increased sensitivity is important because it enables researchers to obtain more in-depth information on mutations. In the past, clinical cancer research focused on approaches to analyze samples with low-frequency mutations. These applications, while sensitive, restrict the number of target genes and, as a result, limit researchers' field of vision. Thermo Fisher's newly launched assay for liquid biopsies, the [lon Torrent Oncomine Pan-Cancer Cell-Free Assay](#), offers increased sensitivity and specificity for targeting more than 50 genes across multiple cancer types, including lung, colorectal, breast, pancreatic, thyroid and others.

Speed is a factor because faster turnaround times mean liquid biopsies could realistically be used as a routine screening tool. While traditional methods for analyzing liquid samples take several hours, Thermo

Fisher is accelerating the process by developing ready-to-go reagents, such as [Cell-Free DNA](#) and [Cell-Free Total Nucleic Acid Isolation Kits](#), that reduce hands-on processing and analysis time while making it possible to standardize DNA prep. Researchers hope that speeding up the time from sample to result may one day enable them to deliver simple blood tests that can efficiently and cost-effectively check at-risk patients for cancer during yearly check-ups. Liquid biopsies could help enable the healthcare system's transition from disease management to preventative care, so we can focus on keeping people healthy rather than treating them when they're already sick.

Q: What is on the horizon for liquid biopsies?

Advancements in precision medicine are driving the need for innovative technologies to build on how we're currently using liquid biopsies. Right now, liquid biopsy is being applied mostly for the detection of DNA and RNA (nucleic acids). Future applications may include the detection of other biomarkers, including proteins, to provide a more holistic picture of cancer and the way the immune system responds to it. As this knowledge develops, enabling clinicians to create more targeted, effective therapies, liquid biopsies may bring us one step closer to a cancer-free world.