

PHASE Scientific

Concentration - A Fine Antidote to Diagnostics

How to detect cancer earlier is a question that often plagued scientists in the race to reach the next cancer diagnostic breakthrough.

One of the more promising solutions, liquid biopsy, can theoretically detect the presence of tumors at a very early stage through a non-invasive diagnostic procedure that detect tumor DNA fragments in blood samples. This can potentially help patients access more treatment options and decrease pain and suffering earlier from the disease.

However, despite decades of advancement in genetic sequencing and health data analytics in liquid biopsy that had provided much valuable insights into the disease, an approaching glass ceiling had limited liquid biopsy's existing application to late stage detection, with potential applications such as early-cancer screening still out of reach. The culprit is the extremely low concentration of the targeted tumor DNA fragments in patient blood samples, which is particularly true for early-stage cancer patients. Failure to extract enough tumor DNA fragments at a high enough concentration for analysis to confidently determine diagnostic signal is the current bottleneck found in liquid biopsy.

BUT WHAT IF THERE WAS A WAY TO CONCENTRATE THE SAMPLE RIGHT FROM THE START?

This is where PHASE Scientific, a fast-growing biotech startup, offers its game-changing proprietary sample preparation technology, which promises early detection of diseases. Sample preparation is the first and a critical step in liquid biopsy processes, where the target tumor DNA fragments, or circulating tumor DNA (ctDNA), are extracted from patient plasma before they are machine processed and data analyzed.

"It doesn't matter how good the machine and the data technology is if the sample that they are using is not concentrated enough," says Ricky Chiu, Chairman and CEO of PHASE Scientific. "Our technology involves proprietary and trade secret formulations that allow for the selective recovery and concentration of target biomarkers, whether it's pathogens for infectious disease detection or circulating DNA for cancer liquid biopsy."

Founded by scientists from the University of California, Los Angeles, PHASE Scientific's innovative technology has the vast potential to disrupt different areas of diagnostics with its superior ability to extract and enrich target molecules effectively by 10-100 folds, in turn making these molecules easier to detect.

"By producing higher quality samples, our sample preparation technology is able to enhance all types of diagnostic platforms in terms of accuracy, efficiency, speed, and cost," says Chiu. The company's core technology is their liquid phase extraction platform from which the name "PHASE Scientific" originated.

The application of PHASE Scientific's technology can be game-changing in their research and clinical-use sample preparation kits for liquid biopsy. According to Chiu, their technique provides unprecedented recovery and purification of ctDNA against industry gold standards in addition to complete removal of unwanted DNA molecules (e.g. genomic DNA) in an industry-first size selection capability.

Validated and endorsed by world-leading academic and research institutes and universities, PHASE Scientific's sample preparation technology is outstanding among market-leading products, being able to extract three to five times more tumor DNA molecules from patients' blood samples. These benefits are extremely useful for markets using



Ricky Chiu



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sample preparation kits for downstream diagnostic processes, including molecular diagnostic service providers, hospitals, and research institutes.

PHASE Scientific plans to develop a portfolio of products for cell-free DNA isolation with different types of samples to unlock new cancer diagnostic applications. "With our products, we seek to enable tumor-profiling and treatment selection, residual disease monitoring and, research and development of targeted therapies for cancers," says Chiu.

Aside from academic and clinical applications for liquid biopsy, PHASE Scientific's sample preparation technology can also be found in an ordinary day-to-day setting.

By concentrating target molecules from different sample types such as saliva or urine for point-of-care test kits (POCTs), quick and highly accurate self-test kits for an array of infectious diseases can become widely accessible to the general public at a low cost.

"We are applying our technology to the two extremes—liquid biopsy and point-of-care tests—within the spectrum of our biomedical application in terms of diagnostics," says Chiu. POCTs, such as blood glucose tests, are typically portable immediate medical tests that are performed at patient bedside or self-administered at home.

"Because, at home, the application needs to be accurate, affordable, and easy to use so that human errors don't come into play," he adds. The idea for this unique concept traces back to when Chiu went to UCLA for his PhD, carrying a dream to create faster, more accessible, and accurate tests for the general public.

The company's first POCT product is a saliva self-test for risk of tooth decay, the world's first of its kind that can be self-administered without professional assistance. This test kit is expected to help the general public better manage their oral health, and work towards tooth decay prevention.

With more POCT applications, such as influenza and hepatitis B following down the pipeline, Ricky's vision is to ultimately unlock the home-use market, allowing easy accessibility to their tests for end-users at home.

As for liquid biopsy, an emerging industry with high market potential, Ricky is confident his technology will become the new market disruptor, enabling new liquid biopsy applications in unexplored areas. "Through our technology, we can transform the way we treat and manage cancer," says Chiu. "And we can lead the way to eventually conquer cancer. That's our mission." 🌐