Professor Allen Chan and his team have been actively researching the diagnostic applications of circulating cell-free DNA. Since 2013, the team started a large-scale prospective study to evaluate the potential use of circulating DNA for the screening of early nasopharyngeal cancer (NPC). Through the screening of over 20,000 subjects, they demonstrated that plasma Epstein-Barr virus (EBV) DNA analysis is useful for screening NPC in asymptomatic individuals. Patients identified by screening had superior survival compared with those who had not been screened. This study was published in the *New England Journal of Medicine* and was selected as one of the ten notable articles published in 2017. To recognise this work, Prof. Chan was awarded the Annual Achievement Award from the Chinese Society of Clinical Oncology in 2018 and the Lo Ying Shek Chi-wai scholarship.

To enhance the accuracy of this cancer screening method, they have developed next-generation-sequencing based methods to differentiate EBV DNA released from cancer and non-cancer cells. The new methods were based on the size and methylation difference between EBV DNA released by cancer and non-cancer cells. The positive predictive values of the two new methods improved to 19% and 35%, compared with 11% of the original study. These two improved methods were published in the *Proceedings of the National Academy of Sciences of the United States of America* (PNAS) and *Nature Communications*, respectively.
Second phase nasopharyngeal cancer screening to address if plasma Epstein-Barr virus DNA analysis can predict risk of future development of the cancer.

Source: Professor Allen Chan