Dxcover® Cancer Liquid Biopsy

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A drop of blood serum is dried on a Dxcover® Slide and analyzed with infrared light. Data is captured from all the vital components, including the body's response to disease. The Artificial Intelligence algorithm provides a result in minutes.

- A spectroscopic liquid biopsy for the earlier detection of multiple cancer types
- Global serum profiling: an opportunity for earlier cancer detection
- Augmentation of FTIR spectral datasets using Wasserstein generative adversarial networks for cancer liquid biopsies
- Liquid biopsies: the future of cancer early detection
- Liquid Biopsy for Pancreatic Cancer Detection Using Infrared Spectroscopy
- Clinical validation of a spectroscopic liquid biopsy for earlier detection of brain cancer
- Vibrational Spectroscopy for the Triage of Traumatic Brain Injury Computed Tomography Priority and Hospital Admissions
- Rapid Spectroscopic Liquid Biopsy for the Universal Detection of Brain Tumours

Cameron et al. applied the Dxcover® Cancer Liquid Biopsy to examine eight different cancers. The test uses Fourier-transform infrared spectroscopy (FTIR) and machine learning algorithm to detect cancer.

Area under the receiver operating characteristic curve (ROC) values were calculated for eight cancer types versus symptomatic non-cancer controls: brain (0.90), breast (0.76), colorectal (0.91), kidney (0.91), lung (0.91), ovarian (0.86), pancreatic (0.84) and prostate (0.86). We assessed the test performance when all eight cancer types were pooled to classify 'any cancer' against non-cancer patients. The cancer versus asymptomatic non-cancer classification detected 64% of Stage I cancers when specificity was 99% (overall sensitivity 57%). When tuned for higher sensitivity, this model identified 99% of Stage I cancers (with a specificity of 59%).

This spectroscopic blood test can effectively detect early-stage disease and can be fine-tuned to maximize either sensitivity or specificity depending on the requirements of different healthcare systems and cancer diagnostic pathways. This low-cost strategy could facilitate the requisite earlier diagnosis when cancer treatment can be more effective, or less toxic.

The earlier diagnosis of cancer is of paramount importance to improve patient survival. Current liquid biopsies are mainly focused on single tumor-derived biomarkers, which limits test sensitivity, especially for early-stage cancers that do not shed enough genetic material. This pan-omic liquid biopsy analyses the full complement of tumor and immune-derived markers present within blood derivatives and could facilitate the earlier detection of multiple cancer types. There is a low barrier to integrating this blood test into existing diagnostic pathways since the technology is rapid, and simple to use, only minute sample volumes are required, and sample preparation is minimal. In addition, the spectroscopic liquid biopsy described in this study has the potential to be combined with other orthogonal tests, such as cell-free DNA, which could provide an efficient route to diagnosis. Cancer treatment can be more effective when given earlier, and this low-cost strategy has the potential to improve patient prognosis [1].

1)
Cameron JM, Sala A, Antoniou G, Brennan PM, Butler HJ, Conn JJA, Connal S, Curran T, Hegarty MG, McHardy RG, Orringer D, Palmer DS, Smith BR, Baker MJ. A spectroscopic liquid biopsy for the earlier detection of multiple cancer types. Br J Cancer. 2023 Sep 16. doi: 10.1038/s41416-023-02423-7. Epub ahead of print. PMID: 37717120.