

Cancer BREAKTHROUGH: Smartphone accessory can diagnose disease in less than an hour

A CUTTING-EDGE smartphone accessory could provide a fast and low-cost new way of diagnosing cancer.



Data recorded by the smartphone-powered device is then sent for processing in the cloud

The device – dubbed a D3 system – includes a battery-powered LED light that allows a standard smartphone to record high-resolution imaging data with its camera.

The D3 system, which stands for digital diffraction diagnosis, is capable of recording data on more than 100,000 cells from a blood or tissue sample in a single image.

Data recorded by the smartphone-powered device is then sent for processing via a secure and encrypted cloud service.

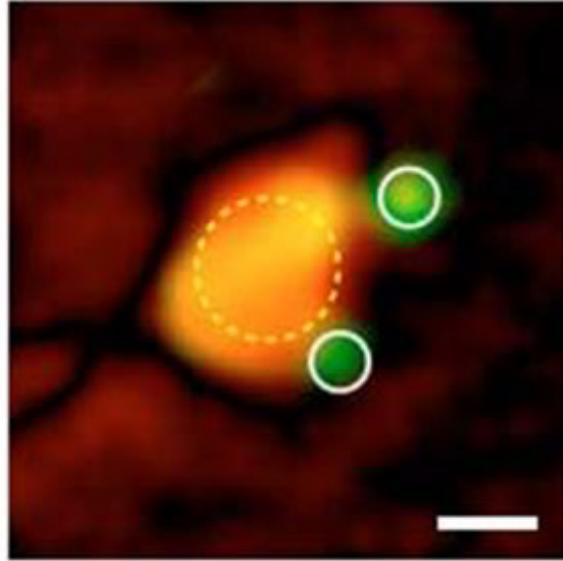
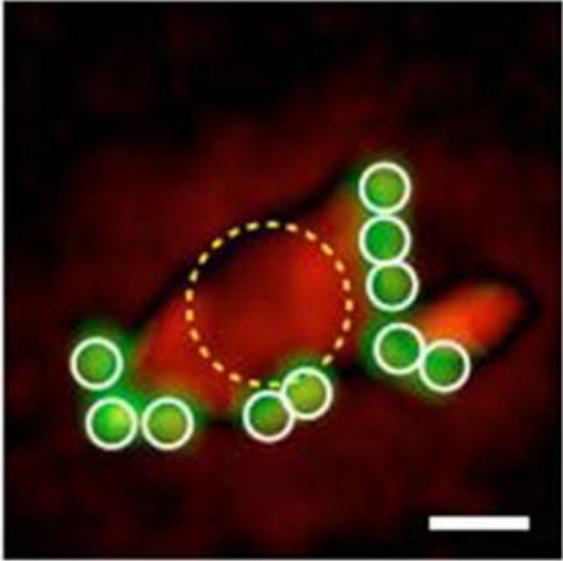
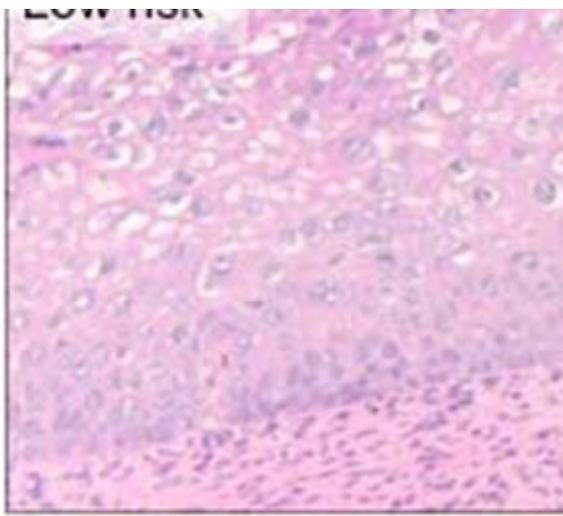
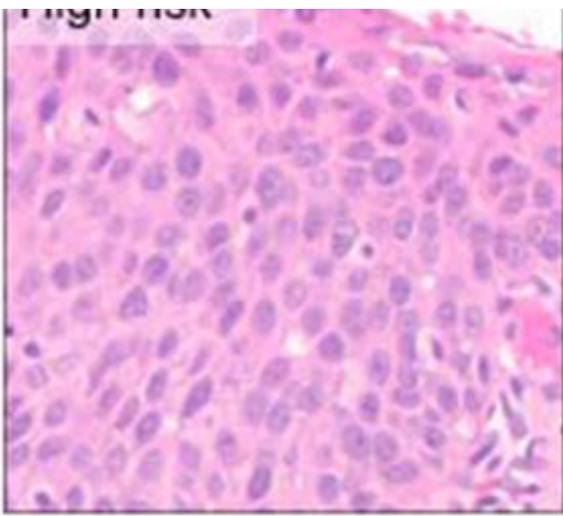
In a pilot scheme for the new system, a correct diagnosis was returned from the cloud servers in less than an hour.

Researchers behind the new system claim the diagnosis costs just £1.25 per sample – and will decrease over time.

Study co-lead author Doctor Cesar Castro, of the Massachusetts General Hospital Cancer Center in the United States, said: "The global burden of cancer, limited access to prompt pathology services in many regions and emerging cell profiling technologies increase the need for low-cost, portable and rapid diagnostic approaches that can be delivered at the point of care."

We expect that the D3 platform will enhance the breadth and depth of cancer screening
Dr Ralph Weissleder





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Samples captured and analysed by the pilot D3 system

"The emerging genomic and biological data for various cancers, which can be essential to choosing the most appropriate therapy, supports the need for molecular profiling strategies that are more accessible to providers, clinical investigators and patients; and we believe the platform we have developed provides essential features at an extraordinary low cost."

Researchers say the D3 system employs the same technology that is used to make holograms to collect detailed microscopic images for digital analysis of the molecular composition of cells and tissues.

Investigators conducted analysis of cervical biopsy samples from 25 women with abnormal PAP smears.

The D3 analysis correctly categorised biopsy samples as high-risk, low-risk or benign – with each of the results matching those returned by conventional pathologic analysis.

Co-senior author Dr Ralph Weissleder said: "We expect that the D3 platform will enhance the breadth and depth of cancer screening in a way that is feasible and sustainable for resource limited-settings.

"By taking advantage of the increased penetration of mobile phone technology worldwide, the system should allow the prompt triaging of suspicious or high-risk cases that could help to offset delays caused by limited pathology services in those regions and reduce the need for patients to return for follow-up care, which is often challenging for them."

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