



The Realisation of Research

New Micro-Cantilever Configuration

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Category(s):

Sensors
Laboratory Equipment & Imaging

Description:

New Micro-Cantilever Configuration

Available for: Licensing and collaborative development

Summary

A team at London Centre for Nanotechnology are developing a device that is already being used to detect the presence viruses, bacteria and proteins from a single sample. It is based on a cantilever sensing method and is configured to give binding energy information as well as a quantitative assay. The new system has already displaced use of the commercially available system in the Lab as the virologists find the new configuration much easier to use. The project is currently supported by the EPSRC for research on HIV management.

The Technology and its Advantages

The nano-cantilever arrays are each coated with substances that stick to HIV and other proteins, which are markers associated with disease progression. Accommodating these markers causes the highly sensitive sensors to bend like a diving board and this bend indicates the level of virus in the sample. The nano-cantilever arrays have also been used to investigate drug resistance in super bugs.

The device will display messages on an integral screen, giving patients access to clear, immediate device. For example, they could be told that their condition remains stable if levels of virus do not change, or they could be told to make an appointment to see their doctor if the virus begins to flare up. If patients neglect to take their treatment or need prompting to see their GP the device will provide a simple way of letting them know. The technology will empower HIV patients to keep a close eye on their health and their treatments. One of the principal advantages of the proposed device is its capacity to monitor viral and immunological markers on a single chip without the need for time consuming analysis that requires specialist laboratories.

This development combines technology from semiconductor processing with modern biology to produce a unique piece of kit for tracking how HIV develops in individual patients, and helping them to keep a close eye on their own health.

The device overcomes the limitations of HIV Diagnosis & Monitoring of current gold standard technologies:

Enzyme-linked Immunosorbent Assays-lack of sensitivity.

Polymerase Chain Reaction (PCR)- costly instrumentation. prep and staff.

Fluorescence Activated Cell Sorting (FACS) - costly instrumentation, prep & staff

Market Opportunity

The patent underpinning the development allows a radical simplification of the optical readout configuration for cantilever technologies. Thus it should be possible to develop a highly compact device that could be used anywhere to diagnose a spectrum of illnesses and conditions from a single sample.

In the UK, there are an estimated 70,000 carriers of HIV. Worldwide, HIV/AIDS has grown to pandemic proportions and today there are 35 million people living with the virus, two thirds of them in sub-Saharan Africa. This development is expected to bring major improvement to UK patient care and will anchor the UK at the forefront of HIV research.

Intellectual Property Status

Entered National Phase 18th November 2009

Further Information

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