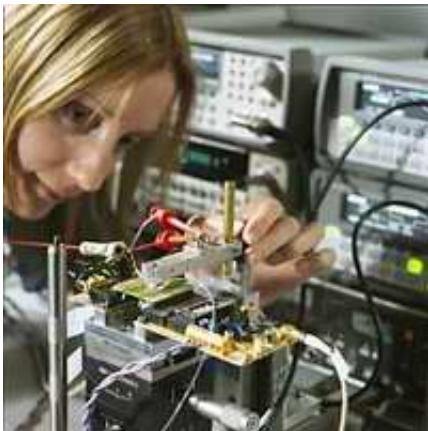


# Philips demonstrates magnetic biosensors for high-sensitivity molecular diagnostics

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Scientists at Philips Research are investigating a new magnetic biosensor technology that promises to radically improve the speed, sensitivity and reliability of biomolecular diagnostics for applications such as protein and pathogen monitoring, near-patient testing in medical centers (blood, urine, saliva tests etc.), and ultimately home testing by individuals.

Philips' biosensor measures the magnetic field created by magnetic nano-particles that bind to target molecules in a biological assay. Compared to optical sensing methods, the use of magnetic nano-particles not only eliminates the additional steps required to bind optical labels to the target molecules. It also promises biosensors that are up to one hundred times more sensitive than existing devices.

Being able to detect specific biological molecules at very low concentrations (10-13 moles/litre and lower) is one of the keys to advanced molecular diagnostics - an area of medicine that aims to identify the onset or predilection to disease before the patient shows any symptoms. If the technology can be made cheap enough and simple enough for widespread use, it will enable the rapid identification and monitoring of proteins and pathogens. As a result, it will be possible not only to give appropriate treatments much more quickly but also to make them patient specific, leading to fewer side-effects and faster patient recovery. In commercial areas such as the food industry the technology will allow far more regular testing regimes to be introduced.

Alongside the development of the silicon-based magneto-resistive sensor chip used in these sensors, Philips is developing an innovative low-cost SiP (System-in-Package) that allows the assay sample to be pumped across the surface of the sensor. It has also adapted ink-jet printing techniques used in the production of flat-panel electro-luminescent displays to apply appropriate biological receptors to the sensor surface. Patterning the sensor with an array of different receptors will allow multiple assays to be performed simultaneously on a single sample. In addition, Philips has borrowed advanced materials and signal processing capabilities from its magnetic sensor activities to increase signals and reduce noise. Philips is currently prototyping a one-time usable biosensor, designed for low-cost manufacture, that could fit into a handheld reader.

Philips' next step in the development of such systems is to work with biomedical companies in order to demonstrate dose-response curves for relevant biological molecules. The company expects the technology could be ready for industrialization in about four to six years. Important contributions to the development of this new biosensor technology have been made by Philips Center for Industrial Technology and Philips High-Tech Plastics.

Source: [www.philips.com](http://www.philips.com)

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