DIAGNOSTICS

# Biosensors extend diagnostic range

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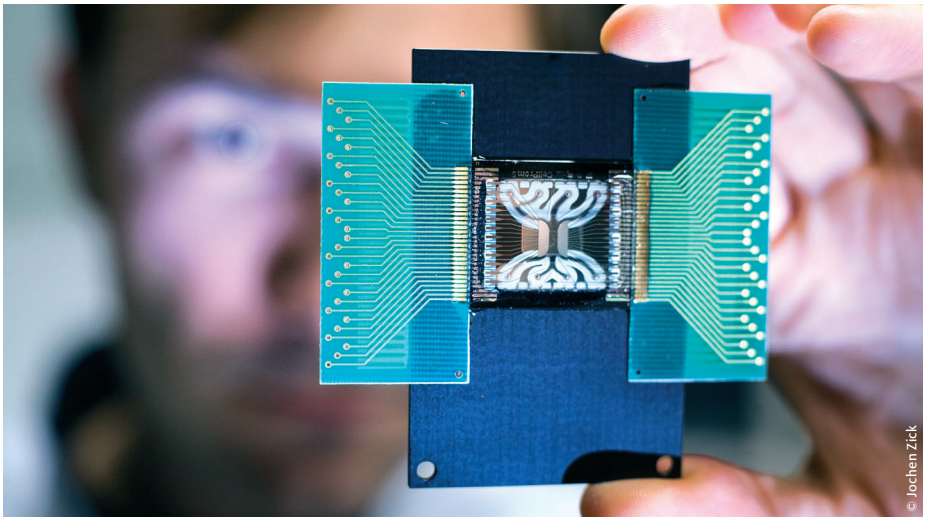
**Biosensors are gaining ground in laboratory diagnostics. Frost & Sullivan is expecting the market to grow at annual rates of between 12%-14%, up from the current US$10bn to US$14bn by 2016. The largest segment (45%) is point-of-care testing (POC). An update on the latest developments in the field was provided at the 8th German BioSensor Symposium in mid-March. The developments presented there range from improved spectroscopic sensors to novel probes to practical medical applications.**

"Biosensors for the specific detection of biomarkers – particularly in a label-free format – are opening the door to an era of personalised medicine," stressed the organiser of the symposium Fred Lisdat, who also chairs Biosystems Technology and is a member of the advisory board for DiagnostikNet-BB. The network of 35 research and industry partners is dedicated to the development of in-vitro diagnostics and biosensors. One example presented at the meeting was new gold-coated carbon nanotube probes, which were developed in the lab run by André Skirtach (Potsdam). They significantly improve intracellular detection of biomarker fingerprints by surface-enhanced Raman scattering. According to the researchers, the current detection limit for sugars or proteins in fibroblasts was in the nanomolar range. Biosensors for selective detection of micro-organisms was another focus topic. Researchers under Jürgen Popp from IPTH Jena presented an antibody-functionalised chip for the capture of pathogens that allows their subsequent identification by Raman spectroscopy. Till Bachmann (Edinburgh) presented a biosensor able to track the MRSA gene mecA down to concentrations of just 10 pM using electrochemical impedance spectroscopy. According to his research group, the label-free technique is designed for use in Point-of-care (POC) settings. Another format for POC biosensing of pathogens was presented by Sebastian Kersting (IBMT, Potsdam), who combined isothermal amplification of bacterial genes with their probe-based detection on lateral flow strips. Such DNA sensors are gaining importance in infection diagnostics because they shorten the time necessary for pathogen diagnosis from weeks (for antibody-based verification) to mere hours.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## Partners help overcome hurdles

Whether simple test strips, lab-on-a-chip or multiplex sensors – biosensors can simultaneously detect several laboratory parameters at little expense, and only require small sample volumes. Since they often enable label-free detection, they can also reduce costs for consumables, and shorten the time needed to make a therapy decision. But despite their tremendous potential – especially in POC diagnostics – many biosensors never get past the development phase.

DiagnostikNet-BB includes renowned research institutes and medium-sized diagnostic companies collaborating to engineer and manufacture marketable biosensors. Network members include the TH Wildau, the Fraunhofer IBMT and Potsdam University, the Institute for High Performance Microelectronics (Frankfurt/O) and Berlin-based BST BioSensor Technology GmbH. In one project, the Biosystems Technology division at TH Wildau and Limetec Biotechnologies are aiming to replace the current Pandy test, which determines protein content in cerebrospinal fluid, with a new rapid test for liquor diagnostics. The Pandy test needs to be replaced because it requires toxic and mutagenic phenol. The new approach provides a visual, easy-to-use, semi-quantitative test that utilises modified absorption properties of agglomerating nanoparticles. Such development projects can be advanced rapidly in the network, and the Network Management team supports interested customers.

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