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Nanomix inks license for UCLA biomolecule detection technology

By Steve Lewis

Nanomix Inc., an Emeryville, CA-based nanotechnology company commercializing a line of nanoelectronic sensors for industrial and biomedical applications, has signed an exclusive licensing agreement with The Regents of the University of California, Los Angeles, for technology used to detect biomolecules such as DNA and proteins.

The licensing agreement gives Nanomix the right to use and further develop the technology, invented by George Gruner, PhD, of UCLA.

The license includes a pending U.S. patent application by Gruner (Number: 20040067530), describing nano-structured electronic devices which include biological probe molecules. The probe molecules produce a measurable electrical effect when binding or interacting with a target biological molecule.

"Dr. Gruner has been affiliated with Nanomix since it's very early stages and consequently has been involved, along with our founders from UC Berkeley and other Nanomix scientists, in the development of the Sensation detection platform," notes David MacDonald, CEO and president of Nanomix, noting that Gruner continues to be involved as a technical consultant to Nanomix. "The subject matter of the recent license agreement with UCLA comes from his application development work in his UCLA lab using the Nanomix Sensation detection platform."

The Sensation technology is an ultra-sensitive nanoelectronic detection platform based on a combination of a network of carbon nanotubes with silicon microstructures. Electrical impedance can be

measured by applying a voltage, thus providing a characteristic signal. The nanotube network is coated with a functional layer that interacts with the chemical or biological analyte of interest. Interactions between the functional layer and the analyte result in a measurable change in the electronic characteristics of the detection device. The 1 nm diameter of the nanotubes allows for ultra-sensitive detection, as very slight changes in electronic characteristics can be measured.

From glucose monitoring to infection detection

MacDonald says that Gruner's discoveries will be used to develop products including a range of sensors and detectors for medical, diagnostic, industrial and forensic uses. "These sensors will permit the direct electronic detection and identification of biomolecules, resulting in faster, simpler and cheaper measurements," he asserts.

The wide range of applications is made possible by the variety of functional layers that can be employed in the Sensation platform, he adds, noting that future applications of the technology may range from glucose monitoring to viral and infectious disease detection, and even homeland security. "We can expand our biodetection intellectual property around this licensed technology," MacDonald asserts.

Nanomix has selected three market segments for deployment of the Sensation detection platform. The industrial gas segment will take a unique hydrogen sensor to market in early 2005, and focuses the company on product commercialization. The second segment, medical breath testing, will initially bring to market a high-volume, disposable application -- a quantitative capnography (CO₂) respiratory monitoring device -- in early 2006. (For more on the capnography application, see *NanoBiotech News*, Sept. 1, 2004, p. 8.) This third market segment, products that employ fundamentally new methods for nanoelectronic biomolecule detection, is targeted for market in 2007.

In terms of pursuing these markets, MacDonald says "Nanomix is open to working with collaborative partners for the development and distribution of these applications." He notes that the current worldwide market for medical and biomolecule detection is \$14 billion, and growing at a rate of 25% per year.

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