

Roswell Biotechnologies and Imec to Develop First Molecular Electronics Biosensor Chips for Infectious Disease Surveillance, Precision Medicine and DNA Storage

Technology Advances Rapid, Cost-effective DNA Sequencing on Portable Devices



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SAN DIEGO and LEUVEN, Belgium, May 5, 2020 /PRNewswire/ -- Roswell Biotechnologies, Inc., the leader in molecular electronics sensor chips, and imec, a world-leading research and innovation hub in nanoelectronics and digital technologies, announced today a partnership to develop the first commercially available molecular electronics biosensor chips. These chips are the brains behind Roswell Technologies' powerful new platform for DNA sequencing, to support precision medicine, molecular diagnostics, rapid infectious disease testing, and DNA data storage.

"The urgent need for a new generation of rapid, low-cost, consumer surveillance and diagnostics tools has been made extremely clear in the current COVID-19 pandemic," said Roswell President & CEO Paul Mola. "In that area, the Roswell molecular electronic platform will transform the way infectious diseases are detected, with powerful new capabilities that enable, rapid screening of many infectious diseases at once, or many viral strains, with portable or handheld devices."

The Roswell platform is the first to deliver the power of molecular electronic sensing, to support a full spectrum of DNA sequencing and biosensing applications. This includes the spectrum of tests necessary for the detection and containment of infectious diseases, such as COVID-19, including sequencing, nucleic acid detection, antigen detection and antibody detection. The platform was also designed with the scalability to provide the solution for rapid, low-cost whole genome sequencing in precision medicine, for treating cancer and other diseases, as well as for reading massive amounts of digital data stored in DNA, which is envisioned as the future of archiving data at the global scale.

Molecular electronic sensor chips integrate single molecules as electrical sensor elements on standard semiconductor chips, making electronic biosensor devices massively scalable. While electronic biosensors have seen gradual adoption in DNA sequencing and other areas of testing, there have been no major innovations in the basic sensor technology. The Roswell molecular electronics sensors represent an entirely new class of sensors, specifically designed to be maximally compatible with modern CMOS chip technology, delivering a technological breakthrough that significantly increases performance and lowers costs. This advance allows low-cost, high speed biomedical tests, including DNA sequencing and other forms of biomarkers sensing essential to modern medical diagnostics, to be deployed on simple portable or handheld devices.

"Although molecular electronics has long been hailed as a scientific breakthrough, its commercial viability required the technology to be put on a standard semiconductor chip," said Roswell Chief Science Officer Dr. Barry Merriman. "One of the significant hurdles to commercializing molecular electronics is the need for costly customized solutions for large scale manufacturing. Imec has overcome those challenges by utilizing state-of-the-art semiconductor manufacturing technology coupled with its deep experience in biosensor technology to commercialize molecular electronics using standard tools. We are excited to be partnering with imec on this effort."

Imec and Roswell have successfully completed key proof-of-concept work and are now focused on final process development. The initial products are expected to be commercially available in 2021.

"Building on its leadership in advanced process development for the semiconductor industry, imec has pushed the limits of what is possible. This next-generation sensor, poised to disrupt bio-sensing, benefits from our broad expertise to solve the manufacturing hurdles," said Dr. Ashesh Ray Chaudhuri, team leader of life science technologies at imec.

Dr. Simone Severi, program director for life science technologies at imec, added, "Our partnership with Roswell is a great example of how imec is leveraging its leadership in state-of-the-art semiconductor manufacturing technology to make next-generation life-science instrumentation possible. We are very excited to collaborate with Roswell on the integration of their molecular electronics sensor and developing the fastest route to achieving large scale commercial manufacturing of their sensor chips. It is especially motivating to use our skills to make a direct impact in important areas of medicine, such as genome sequencing and infectious disease monitoring, as well as to open up new sectors such as DNA storage of Exabyte scale DNA."

About Roswell Biotechnologies

Roswell Biotechnologies, Inc. is the leading developer of molecular electronics for chip-based DNA sequencing and biosensing. The company's platform technology reduces the cost and complexity of DNA sequencing to address large markets in infectious disease surveillance and containment, precision medicine, molecular diagnostics, and DNA

digital data storage. Roswell Biotechnologies' patented molecular electronics biosensor chip is the first to integrate molecular elements into semiconductor chips, by combining the latest advances in sensors and nanotechnology, to fundamentally advance the application of DNA sequencing and biosensing. Founded in 2014, the privately held company is headquartered in San Diego, California.

About imec

Imec is a world-leading research and innovation hub in nanoelectronics and digital technologies. The combination of our widely acclaimed leadership in microchip technology and profound software and ICT expertise is what makes us unique. By leveraging our world-class infrastructure and local and global ecosystem of partners across a multitude of industries, we create groundbreaking innovation in application domains such as healthcare, smart cities and mobility, logistics and manufacturing, energy and education.

As a trusted partner for companies, start-ups and universities we bring together more than 4,500 brilliant minds from over 95 nationalities. Imec is headquartered in Leuven, Belgium and has distributed R&D groups at a number of Flemish universities, in the Netherlands, Taiwan, USA, and offices in China, India and Japan. In 2019, imec's revenue (P&L) totaled 640 million euro. Further information on imec can be found at www.imec-int.com.

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