Medical Xpress

A boost for medical imaging

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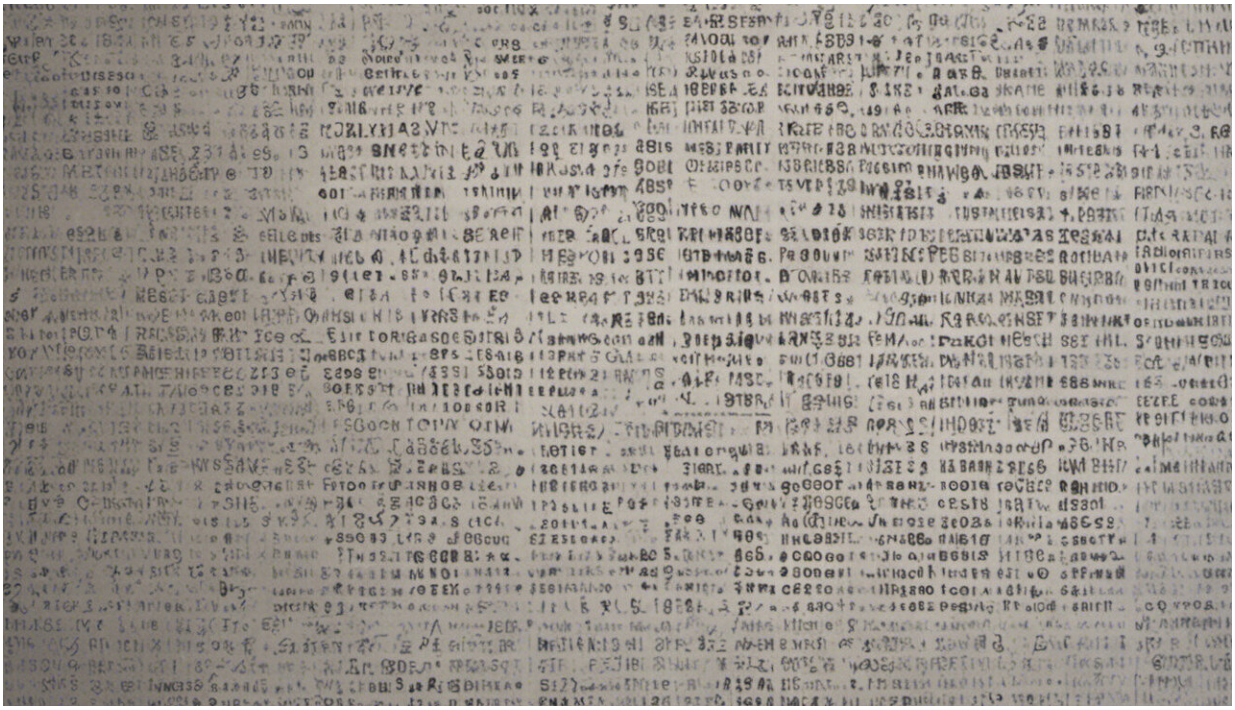

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The A*STAR Institute of Microelectronics and nanoX Imaging Ltd join forces to develop a new medical X-ray imaging detector.

In a move that promises to accelerate the development of a novel, highly sensitive X-ray imaging detector, the A*STAR Institute of Microelectronics (IME) has formed a collaborative partnership with the multinational start-up nanoX Imaging Ltd, a provider of medical imaging

solutions. The project is likely to offer improvements in current medical imaging technologies and the treatment of a number of serious human diseases.

The collaboration builds on the IME's successful development of microelectromechanical systems (MEMS) devices for a broad range of biomedical applications. Dim-Lee Kwong, executive director of the IME, praises the strategic partnership as being well-timed to benefit the growing global market for medical technology products.

The X-ray imaging system, first developed in the 1890s, is the most widely used method of examining the body's internal organs, tissues and bone structure that does not require invasive surgery. In recent years, dramatic advances have been made in the development of X-ray detectors, largely due to the rapid expansion of the semiconductor and thin-film industries. However, some abnormal tissues—such as cysts and tumors—remain difficult to detect with current technologies, unless examined using high levels of radiation, which can pose risks to the patient.

The IME–nanoX Imaging partnership aims to develop a high-performance and commercially viable MEMS-based X-ray imaging detector that employs field emission detection. Research will focus on enhancing detection sensitivity and improving digital signal processing performance, which could lead to earlier diagnoses that are made with greater accuracy and reduced exposure to radiation. "Image quality will continue to be the paramount criterion, and overcoming the current limitation will benefit all stakeholders in this industry," adds Kwong.

Key to the collaboration is the institute's experience and state-of-the-art facilities, which include advanced capabilities in silicon-based MEMS processes. "We sought a good 200-millimeter MEMS foundry over the world and finally came to the IME, recognizing its capabilities best fit

our requirements as we planned for the transition from development to commercialization," says Hitoshi Masuya, CEO of nanoX Imaging.

Since its founding in 1991, the IME has developed pioneering technologies that span the fields of bioelectronics, integrated circuits design and photonics. By actively engaging the wider semiconductor community and identifying global trends in advanced manufacturing, the IME is able to support the growth of emerging applications from the concept, design and prototype phases to full commercialization. Thus, extending the use of MEMS technology to incorporate X-ray imaging detectors will reinforce the IME's expertise in developing innovative, cost-effective MEMS products and devices for real-world applications.

Through its partnership with the IME, nanoX Imaging joins an increasing number of biotechnology and nanotechnology companies that are establishing research ties and facilities within Singapore. Meanwhile, the IME continues to make a significant contribution to the country's growing reputation as a hub of MEMS research and development through a variety of cooperative activities. These include co-presenting the MEMS Forum with SEMI, a global industry association that supports advances in the micro- and nanoelectronics industries. Held in May 2013, the forum brought together academics and industry experts to discuss and propose strategies for successfully taking innovative MEMS-based technologies to market.

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