SynCardia Co-Founder Dr. Marvin Slepian Helps Develop Biodegradable Electronics that Vanish Inside the Body

Findings on "Transient Electronics" Reported in Sept. 28 Cover Story of the Journal Science

SynCardia Systems, Inc. [1], manufacturer of the world's first and only FDA, Health Canada and CE approved Total Artificial Heart, announced today that Marvin J. Slepian, MD [2], the company's co-founder, chief scientific officer and chairman of its Science Advisory Board, has helped develop a new class of small, high-performance electronics that are biodegradable and capable of dissolving completely in water or bodily fluids. The applications which appear most promising for this transient technology are medical implants, consumer electronics and environmental monitors.

"Concerning the medical application, many of the devices we implant into patients are only needed temporarily. Once the medical need for them has passed, biodegradable devices would disappear, without the permanent burden for the body," said Dr. Slepian, Director of Interventional Cardiology and Professor of Medicine at the University of Arizona (UA) Sarver Heart Center with a joint appointment in the UA Department of Biomedical Engineering.

"We are thinking about marrying this technology with existing devices, for example the SynCardia temporary Total Artificial Heart [3]. Ideally, we'd like to be able to implant transient sensors along with the device - for example, pressure sensors that keep track of the blood pressure in the pulmonary artery or the aorta - for the first two weeks after surgery. This would help immensely with the management of such patients," he said.

Researchers at the University of Illinois, in collaboration with Tufts University, the University of Arizona and Northwestern University, have already demonstrated several devices utilizing transient electronics. For example, an implantable system designed to monitor and prevent bacterial infection at surgical incisions has been successfully demonstrated in rats. The findings were reported in the cover story [4] of the Sept. 28 issue of the journal Science.

Dr. Slepian has a long history of research and development with biodegradable biomaterials. In the late 1980s, he developed a process referred to as "Polymeric Endoluminal Paving and Sealing," which was the prototype for the first form of biodegradable stenting. Unlike conventional metal stents, which are used to keep blood vessels open after they are cleared of blockages, the biodegradable paving coats the inside of the blood vessel, similar in concept to a cast.

Watch video [5] of transient electronics dissolving in water

Read the abstract [6] published in Science
View the news release [7] from The University of Arizona

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Links:
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