News Release

Elpida Memory & Hiroshima University's Joint Research Project Selected for Funding Under Ministry of Education, Culture, Sports, Science and Technology's "Center for Creating Innovations in Advanced Integrated Technology" Scheme

TOKYO, September 13, 2006 –Hiroshima University, one of the world's top research universities, and Elpida Memory, Inc.(Elpida), Japan's leading global supplier of Dynamic Random Access Memory (DRAM), today announced that their joint research project on the creation of technologies that integrate semiconductors and biotechnology has been selected by the Ministry of Education, Culture, Sports, Science and Technology as a candidate for funding under the "center for creating innovations in advanced integrated technology" scheme newly conceived by the Ministry's Science and Technology Promotion Bureau. The competition to obtain this funding was intense, as only one of every five proposals was selected.

The concept behind the scheme is to promote cooperative research and development between industry and academia in the field of advanced integrated technologies, which have the potential to impact greatly on society and the economy through the introduction of new technological developments and the creation of new industries in the next 10 or 15 years. The scheme—which will focus on seeking practical applications from basic theory—will be used to create a global research base for generating technological innovations and build a support system for tomorrow's researchers and engineers.

Under this scheme, Hiroshima University and Elpida proposed a joint business research project on the creation of technologies that integrate semiconductors and biotechnology. The proposed project was one of nine of 46 selected by the Ministry as a "center for creating innovations in advanced integrated technology." As a result, the joint project will receive funding support from the Ministry's Science and Technology Promotion Bureau starting in the current fiscal year.
As part of getting the business project underway, Hiroshima University plans to set up an integrated technology research and education facility in 2007. The facility will be outfitted with the necessary equipment and will employ researchers from both inside and outside the university who appear capable of meeting the challenges of the project. Hiroshima University will also work together with Elpida to use new theories and materials to research technologies that can realize ultra-high density memories and high-sensitivity biosensors. At the same time, the university will train researchers and core staff with the aim of promoting innovations in integrated technologies based on linkages between industry and academia.

Working with Hiroshima University, Elpida will:
1) dispatch its own researchers and
2) install advanced equipment facilities at Hiroshima Elpida for use by the project and in cooperation with Hiroshima University.
In these and other ways Elpida will be fully involved at all stages of the project, from basic research

through to technology verification.

Elpida believes that the fruits of this research will bring the company closer to its aim of becoming the world's number one memory maker.

Elpida and Hiroshima University also hope that the innovations generated by this project will contribute to realizing a safer, healthier and more secure society, as well as create new fields of global industry. Elpida and Hiroshima University expect that in the next 10 or 15 years this project will yield results such as the development of a "drinkable biosensor" which integrates a biosensor, memory and uses wireless communication and terabit-level ultra-high density memory technology. The former could be used in medical applications to quickly and conveniently allow early diagnosis of disease and diagnosis of intestinal bacteria or high cholesterol, while the latter could be used to enable innovations in the fields of digital information systems, robotics and automotive technologies.

In principle, the Ministry's funding period for the kind of joint project run by Elpida and Hiroshima University will be 10 years, with the Science and Technology Promotion Bureau responsible for providing funding of 500 million to 1 billion yen annually (200 to 500 million yen for the first three years) to each "center for creating innovations."

The innovations to be generated by the Elpida / Hiroshima University project and the way the project will work are summarized below.

-- Innovations to be generated by the project for integrating semiconductor and biotechnology

Elpida and Hiroshima University intend that this project will yield the following innovations in the next 10 to 15 years:

1) In the field of medical diagnostic systems, the creation of a "drinkable biosensor" consisting of a biosensor and brain chip. Information can be collected via wireless communication and used quickly and conveniently for early diagnosis of disease and diagnosis of intestinal bacteria and high cholesterol.
2) In the field of environmental information systems, the creation of nano-size sensors to be embedded in plants to detect environmental pollutants under natural conditions, leading to a safer environment.
3) The realization of terabit information systems using high-density memories and brain chips. This kind of "brain", with human-type or higher performance capabilities, can be used to realize applications in a wide range of fields, especially those in which there is close contact with humans, such as robotics and automotive applications.

-- How this project will work

High-powered research and development in the field of biotechnology at Hiroshima University has led to the world's first discovery of proteins that bind with asbestos, as well as other finds such as new allergens. These discoveries have already produced valuable results. The university's research has also contributed to the realization of nanometer-scale ultra-fine devices in the field of silicon semiconductor technology. Nanowire transistors were tested in the university's cleanroom, where their fundamental operation at room temperature could be confirmed at the electron level. Tests of silicon quantum dot array structures were also successfully carried out, showing how this technology could be used in high-sensitivity optical sensors.

In order to enable this kind of integration between biotechnology and semiconductor technology, new technologies that can link the organic world of living molecules with the inorganic world of electronics are needed. The discovery by Hiroshima University of a peptide that can bind with silicon represents one step in this direction. This peptide has led to the creation of an innovative all-purpose adhesive that enables active proteins to be formed on silicon nanodevices. Hiroshima University has

called this discovery the “silicon-bio method”. Use of this new method will make it possible to realize high-sensitivity biosensors that can detect a wide range of biomolecules, as well as diagnostic systems that use these sensors.

Also, higher-density memories will be indispensable in the realization of tomorrow’s high performance digital information systems. There are worries, however, that limits to device micro structures mean that memories—currently in the gigabit range—are reaching their maximum levels of storage capacity. Elpida and Hiroshima University aim to use this project to find ways to create the ideal memory for next-generation systems in terms of capacity, speed and non-volatility. This will involve finding new materials for producing high-dielectric capacitors, proposing new theories on data recording and utilizing organic materials. By using these new materials and 3D structures, it will be possible to develop technologies that will lead to the creation of ultra-high density terabit memories. The key to higher density memory—and to another important consideration, increased functionality—will be the development of technology that enables data to be stored in an easy-to-read format and transferred via three-dimensional structures—the same function performed by the human brain. The way to develop such a technology will be to utilize the wireless interconnect technology developed as part of the Hiroshima University 21st Century COE program.

Through the above means, Elpida and Hiroshima University aim to realize a three-dimensional bio-brain that comes with a biosensor, high-density memory and wireless communication functions.

About Hiroshima University
Hiroshima University is an integrated research university with ten faculties, ten graduate schools and one research institute, along with many education and research facilities.
Under The National School Establishment Law, Hiroshima University was established on May 31, 1949. Since its foundation, Hiroshima University has strived to become one of the most prominent and comprehensive universities in Japan for the promotion and development of scholarship and education. The Center for Technology Research and Development (CTRD) was established on April 1, 1995. The Center promotes technology and engineering development through cooperative research activities among universities, local industries and governmental organizations.

About Elpida Memory, Inc.
Elpida Memory, Inc. is a manufacturer of Dynamic Random Access Memory (DRAM) silicon chips with headquarters based in Tokyo, Japan, and sales and marketing operations located in Japan, North America, Europe and Asia. Elpida’s state-of-the-art semiconductor wafer manufacturing facilities are located in Hiroshima, Japan. Elpida offers a broad range of leading-edge DRAM products for high-end servers, mobile phones, digital television sets and digital cameras as well as personal computers. For more information, visit www.elpida.com.

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