

## **PRESS RELEASE – March 15, 2010**

### **International research starts revolution by bringing computer chips to life**

Life-like solar panels that constantly renew themselves. Life-like computer systems that store data for millions of years. And life-like medical devices that detect, report and repair disease deep inside the human body.

Today this is science fiction. But living energy, medical and computer devices could be a reality thanks to new research into living technology, a groundbreaking field at the crossroads between computer technology, biotechnology and nanoscience.

“We’re paving the way for a revolution,” says Professor Steen Rasmussen from the University of Southern Denmark – project coordinator for the consortium of researchers from Denmark, Germany, Italy and Israel who kick-started the project at the European Center for Living Technology in Venice earlier this month.

“The industrial revolution mechanised production with factories. Then the information revolution mechanised information processing with computers. Now we’re combining production and information processing in an artificial subcellular matrix, which imitates living cells found in plants, animals and humans.

“The technology we’re developing is different from anything we know today. It will be based on the same principles as life. If your mobile phone breaks, somebody needs to fix it. But if you cut your hand, it heals itself. Living technology has potential applications in all sectors of our society and therefore has the potential to change how we live. The possibilities are endless – both beautiful and scary.”

#### **How it works**

The researchers have started creating an artificial subcellular matrix called Matrix for Chemical IT or MACHIT. It imitates internal functions of a biological cell, namely information processing, self-programming, self-repair, self-assembly and self-replication. MACHIT can make its own decisions – just like a biological cell operates as a combined information processing and production machine, identifying and creating what is needed. The scientists, however, programme MACHIT’s main tasks.

This is possible by combining MEMS (Micro-Electronic-Mechanical Systems) technology with soft nano- and micro-scaled functional materials as well as a chemistry that could be similar to the biochemistry found in the earliest organisms on earth.

“The matrix is made up of chemical containers on a silicon chip. By applying DNA tagging and DNA computing, the containers interact inside minute channels on the chip. We use micro cameras to feed information about the containers into a computer, which calculates how electrodes or channels are opened or turned off. As a result, the containers can be guided around the chip and provide what the system needs to complete its programmed tasks,” concludes Professor Rasmussen.

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## **Background information**

The international consortium consists of the following research groups:

- The Center for Fundamental Living Technology (FLinT) and the Mærsk McKinney Møller Institute at the University of Southern Denmark
- The BioMIP group and the group for Bioorganic Chemistry I at Ruhr-University Bochum, Germany
- The Department of Molecular Genetics and the Department of Biological Chemistry at the Weizmann Institute, Israel
- The European Center for Living Technology, Venice, Italy.

The research project has received funding (€2.8 million over three years) from the European Commission's Seventh Framework Programme (FP7/2007-2013).

[www.fp7-matchit.eu](http://www.fp7-matchit.eu)

Images are available on request.

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