

Implant Systems

The future of medical implants



At a Glance

The medical device industry is seeking to provide increasingly complex neuro-stimulation therapies for conditions such as epilepsy, Parkinson's disease, and chronic intractable pain.

In order to effectively address these complex disorders, systems are needed that can monitor and stimulate many sites across the body.

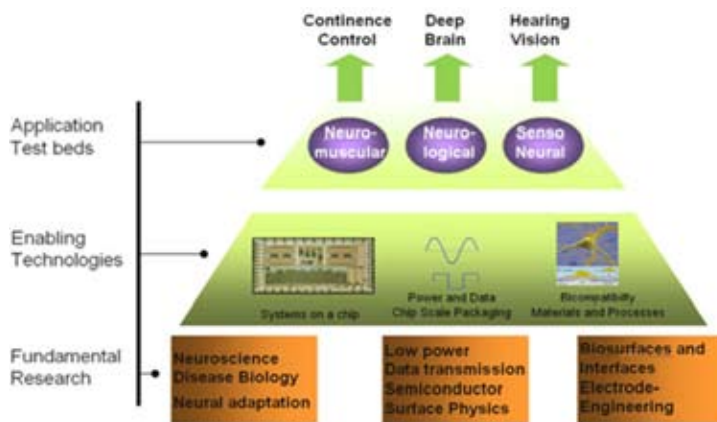
Current implant device architectures are limited in that they cannot emulate the complex biological behaviours of the human body. They are also hindered by their poor ability to withstand the harsh environment of the human body, leading to high rates of component failure.

The Features

- Automated microtechnology enabling mass production and miniaturisation
- Body-ready, sealed micro-packages that can house processors or drugs
- Local and system-wide intelligence
- Low power, fault tolerant systems that imitate biological functions.

The Benefits

- Performance – an enabling technology with higher tissue contact area and greater control in the complex nervous system
- Safety – superior mechanical properties reduce device failure rate and newly enabled designs allow reductions in procedure numbers and duration
- Cost – highly automated production methods reduce component costs and lead to reductions in surgical costs
- Ease of use – with better designed components, implantation will be made easier.



The NICTA Approach

The NICTA Implant Systems team is developing a series of technologies which will be fast and cheap to manufacture and implement. These technologies include:

- New hardware and software device architectures capable of simultaneously monitoring and stimulating multiple sites around the body
- New microelectronic packaging technologies that will vastly improve the ability of devices to behave more naturally
- New micro-technology methods for tissue interface technologies which increase performance and enable new structures

The Future

The medical implant of the future will be a long life, increasingly autonomous device that can emulate complex electrical, mechanical and chemical behaviours of biological systems.



From imagination to impact



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NICTA

NICTA is Australia's Information and Communications Technology (ICT) Research Centre of Excellence and the largest organisation in Australia dedicated to ICT research. NICTA drives innovation through high-quality research, research training and technology transfer.





Our researchers are located in five laboratories located in four cities around Australia: Melbourne, Sydney, Canberra and Brisbane. Working in specialised teams, they are focused on a series of specific research themes and business areas.

Our work as a world-class research institute and Centre of Excellence in science and innovation brings together many of Australia's and the world's top ICT researchers. NICTA provides them with the facilities and support they require, making our vision a reality.

NICTA's unique approach fosters and develops ICT research. We work closely with both industry and other research institutions to solve problems and make breakthroughs in ICT with real impact.

NICTA's focus on use-inspired research means our projects have direct relevance to the challenges faced by business, government and individuals around the world. The result is breakthrough technologies that provide commercial opportunities and have a positive impact on Australia's export earnings.

Our Research Themes:

-  Embedded Systems
-  Networked Systems
-  Making Sense of Data
-  Managing Complexity

Our Business Areas:

-  Biomedical and Life Sciences
-  Environmental Management
-  Intelligent Transport Systems
-  Mobile Systems and Services
-  Safety and Security
-  Software Infrastructure

For more information about Implant Systems

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Australian Government
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