

***Investment Brief for  
Combining Forces to Improve  
Artificial Muscles***

***NSW  
AREA HEALTH  
SERVICES***

***Office of Commercialisation***

***For further information under a Confidential Disclosure  
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# Combining Forces to Improve Artificial Muscles

## Business Opportunity

A licence opportunity exists for a company interested in commercialising a new method of actuation (movement) using intelligent materials or artificial muscles. The simple yet effective method overcomes a major hurdle in the industry - how to scale up small efficient intelligent materials into large scale actuators without the loss of overall efficiency.

Most types of artificial muscle (such as intelligent polymers or shape memory alloys) show promising results when examined in small volumes/lengths. This is because, in most cases, efficiency grows with decrease in size of the material. The practical problem in producing viable actuators from these types of materials has been how to scale them up without the loss of efficiency.

Northern Sydney Central Coast Health researchers have devised a method that emulates natural muscles by using a large number of micro actuators that work together to produce large-scale strokes and forces.

A potential platform technology, the result is a novel assembly that can combine, summate, and amplify the forces and movements generated by multiple units of intelligent material.

This technology is applicable to a wide range of scales from micro to macro. Once made into a feasible, practical solution, the technology can be used to aid several different types of actuators with diverse characteristics. Through miniaturisation (achievable due to its simple structures), the invention has the potential to become a platform technology with applications in Nanotechnology.

## Market

Intelligent Materials are the future in actuation. Their higher efficiency and energy densities exceed what is currently available through electric, hydraulic, pneumatic or chemical motors/actuators.

Improving the usefulness of Intelligent Materials will benefit biomedical applications (particularly in biomechanical rehabilitation and artificial muscles), as well as applications in robotics, and the automotive and aerospace industry.

The sensor/actuator market is estimated to grow at a cumulative average annual rate of 21% between now and 2010 (IC Insights). By 2010, sensor/actuator sales will reach nearly US\$12 billion.

About 80% of sensors/actuators employ microelectro-mechanical systems (MEMS) technology to perform transducer functions. The latest YOLE forecasts indicate that the micro MEMS markets will grow from US\$5.1B to US\$9.7B, representing an annual growth rate close to 15%.

## ***Investment Opportunity***

Northern Sydney Central Coast Health is seeking a partner able to prototype and commercially develop this technology in the exciting area of Intelligent Material actuation.

The present invention offers a method for solving a major hurdle in the industry, namely how to scale up small efficient Intelligent Material into large-scale useful actuators.

The nature of the investment would be through a licence deal.

## ***Status of Intellectual Property***

Australian Provisional application #2006900944 Mechanical Actuation System filed on 24 February 2006.

## ***Technology Investment Brief***

Industry	Sensors/Actuators
Proposed Business	Actuators for intelligent material applications

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