

Media release

Novel and pioneering research offers hope for cardiovascular disease

Australian research is increasing our understanding of cardiovascular disease, the leading cause of premature death in Australia,¹ following the identification of key 'master regulator' genes (such as EGR-1) by Professor Levon Khachigian which control the thickening of arteries after balloon angioplasty.

In recognition of his ground-breaking research, Professor Khachigian, from the University of New South Wales, was last night awarded the GlaxoSmithKline Australia Award for Research Excellence.

“Two million people every year need to undergo an angioplasty, a procedure that relieves narrowing and obstruction of clogged arteries by inflating a small balloon at the site of the blockage. Although the procedure is very effective, in many cases the arteries re-narrow within a few months,” said Professor Khachigian at the GlaxoSmithKline Awards Dinner attended by around 300 of Australia's top medical researchers.

Levon Khachigian's discovery that within minutes of an angioplasty, key transcription factors like EGR-1 awaken in blood vessels from their usually dormant state, led him to study its role in triggering artery re-narrowing. “I realised very quickly that if we could control EGR-1 then we could slow down or stop the process of narrowing of the arteries,” said Prof Khachigian.

The GlaxoSmithKline Award for Research Excellence is awarded annually in recognition of distinguished discoveries in scientific and medical research which could lead to significant benefits to human health.

Commenting on the Award, Mr Paul Lirette, Managing Director, GlaxoSmithKline Australia, said the company is committed to supporting innovation, research and development for the wellbeing and economic benefit of all Australians.

GlaxoSmithKline invested \$32 million in research and development in Australia in 2005 and is in the Top 10 R&D companies in Australia.²

“Developing Australia's knowledge base and supporting scientists like Professor Khachigian is critical to our future as a country offering world class research and science capabilities,” said Mr Lirette.

¹ Australian Institute of Health and Welfare “Cardiovascular health”
<http://www.aihw.gov.au/nhpa/cardiovascularhealth/index.cfm>

² Australia's 2005 R&D and Intellectual Property Scoreboard

Levon Khachigian and his team of researchers at the University of NSW have developed enzymes made of DNA, or DNAzymes, which find and silence the EGR-1 gene. He has used DNAzymes as unique tools to increase our fundamental understanding of the complex mechanisms of driving gene expression in vascular cells.

“DNAzymes are essentially 'molecular assassins' that seek out specific genetic material, bind it tightly and destroy it quickly, ultimately stopping the targeted gene from working”, he said. “We have now expanded our armoury of gene-modifying agents using other cutting-edge nucleic acid-based technologies targeting key "master regulators" ”.

His pioneering work with arteries made Professor Khachigian eager to explore other common debilitating diseases. “We have recently demonstrated the capacity of our molecular assassins to block arthritis, blindness, lung sepsis and gut inflammation in experimental animal models, as well as inhibit tumour growth by blocking angiogenesis, the formation of new blood vessels,” said Professor Khachigian.

The next challenge for Levon Khachigian and his team is demonstrating how his tools, which work in a wealth of animal models, can be exploited therapeutically in humans. Clinical trials are planned for early 2007 and commercial partners are being sought through NewSouth Innovations (UNSW).

Professor Khachigian, who is also President of the Australian Society for Medical Research, told the audience: “Health and medical research in Australia is a 'golden egg'. Disease prevention reduces the number and length of hospital admissions and increases workforce productivity and wealth creation. In fact, research shows that for every dollar invested in research, there's between a \$5-8 return to this country per year. If we don't spend the money now, we'll have to spend much, much more later,”

Recipients of the GlaxoSmithKline Award for Research Excellence receive an honorarium of \$50,000 to acknowledge their discovery and contribution to science and help further their work. The Award is regarded as one of the most prestigious within the Australian research community. A requirement of the Award is that the majority of the research is undertaken in Australia.

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