



VESKI Innovation Fellow

Professor Michael Cowley PhD

Research Project:

“Re-establishing glucose sensing in α -MSH cells to treat diabetes.”

Project Summary:

Professor Cowley and his team recently discovered that a specific group of neurons in the brain detects blood sugar levels and these are probably master cells regulating metabolism

(Parton et al., 2007). These cells produce a transmitter (that can also act as a hormone) called melanocyte stimulating hormone (α -MSH) and this regulates the production of glucose by the liver and the use of glucose by tissues in the body. How α -MSH does this is unknown, but the researchers do know stimulation of α -MSH secretion in response to glucose normalizes blood sugar levels in obese diabetic mice. They have recently uncovered evidence in human liver transplant patients that the brain regulates glucose secretion from the liver in humans too.



Unfortunately in diabetic mice glucose is unable to stimulate α -MSH secretion in response to glucose, so the feedback loop fails, and blood glucose levels rise catastrophically. They have developed 2 therapeutic interventions, the first is a molecule called genipin that reactivates α -MSH in response to glucose in diabetics.

The second intervention is to develop long acting analogues of α -MSH for acute treatment of diabetes. These new therapies would compliment existing diabetes treatments. The overall strategy will be to confirm and refine treatment with genipin and α -MSH and conduct trials in non-human primates. Optimal doses would be determined and the development of pharmaceutical products would be progressed with a pharmaceutical company partner (Orexigen Therapeutics) and the objective would be clinical trials within 3 years.

Personal History

Prof Michael Cowley is aged 39 and was born in Melbourne growing up in Ferntree Gully. His tertiary education was at Melbourne University where he completed his Bachelor of Science in 1989. Between 1994 and 1998 he was a graduate student of Reproductive Neuroendocrinology, Department of Physiology, Monash University and Prince Henry’s Institute for Medical Research in Melbourne.

In 1996 as part of the Queen Elizabeth II Silver Jubilee Trust for Young Australians, he was awarded “Queen’s Trust Achiever Award” to travel to the Brain Metabolism Unit in Edinburgh (U.K.) and work for several months.

More recently in the US he has been Associate Professor in the Division of Neuroscience, Oregon National Primate Research Center, Oregon Health and Science University, Beaverton, USA where he specialised in research into obesity.

Professor Cowley is the founder of Orexigen Therapeutics, a company developing new therapies for obesity, diabetes and neurological diseases. The company was listed on the NASDAQ in 2007.

Professor Cowley is married with two children aged 5 and 18 months. In relocating back to Melbourne he is living with his family in Balwyn.

Other VESKI Innovation Fellowship recipients:

Professor Andrew Holmes AM FRS FAA FTSE

Professor Marcus Pandy PhD

Dr Gareth Forde PhD

Dr Alyssa Barry PhD

VESKI Fellows in an ambassadorial role include:

Professor Adrienne Clarke AC

Professor Peter Doherty AC

Professor Alan Trounson

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BACKGROUND INFORMATION

VESKI [Victorian Endowment for Science, Knowledge and Innovation] assists outstanding Australian scientists and leading innovators to undertake their research in Victoria and contribute to building an inspired community where innovation, ideas, and business provide benefits for Australia. VESKI is supported by the State Government of Victoria.

