



VESKI Innovation Fellow

Dr Matthew Call

Research Project

Intramembrane mechanics of immunoreceptor activation

Project Summary

Cells of the immune system actively survey their surroundings for signs of infection or cancer to initiate an appropriate immune response.



Dr Matthew Call's research focuses on the structure and function of the molecular sensors used by these cells to detect any dangerous events. Portions of these sensors are deeply embedded in the cell membrane where they are very difficult to study, yet these very domains are likely to perform crucial roles in transmitting environmental information to the cell interior and are thus excellent targets for developing new drugs.

Dr Call recently developed innovative biochemical and biophysical techniques that open a view into this "blind spot" in immune signaling and discovered important features of receptor structure that were previously inaccessible.

Dr Call says his research addresses the mechanisms controlling immune activation at the very earliest stage: the point at which a cell performing active surveillance of the body for markers of infection or transformation encounters molecular signals that are capable of initiating an immune response.

As such, he believes this project will provide new insights into a problem that is central to all of infectious disease, autoimmunity and cancer immunology.

With access to Victoria's world-class bioresearch facilities and potential collaborations with scientists such as Professor Peter Colman, who have a wealth of experience developing new pharmaceuticals using molecular structures, he will build upon these discoveries to push beyond static views of receptor structure and describe the molecular forces controlling immune activation.

"This VESKI Fellowship will support innovative and cutting-edge research into new areas of immune regulation, creating new training opportunities in medical research, high-impact publications and the potential for development of an entirely new class of immunomodulatory therapeutics."

Dr Matthew Call

Dr Call describes his research as a new string to Victoria's protein structure and drug development bow.

"Victoria has an excellent reputation in the areas of structural biology and structure-based drug design of new medicines owing to first-class infrastructure (for example the Australian Synchrotron) and first-class people, including researchers such as Professors Rossjohn, Whisstock, Parker, Colman and others, all prominent structural biologists."

Dr Matthew Call

Rather than duplicating the skills and expertise of this group, Dr Call believes he will add a new dimension to this vibrant community and he looks forward to ensuring that Victoria's reputation in this area is further enhanced in decades to come.

Personal History

Dr Matthew Call comes to Melbourne from Harvard Medical School in the United States and is married to his laboratory colleague, Dr Melissa Call, who is originally from New Zealand.

Both Matthew and Melissa have been appointed Laboratory Heads within the Structural Biology Division at The Walter and Eliza Hall Institute of Medical Research (WEHI). Matthew took up his VESKI Innovation Fellowship on 1 March 2011.

Dr Call grew up in Dallas, Texas and is the younger of two children. His parents, who are now retired, were both involved in public education. His mother was a kindergarten teacher and his father was a Minister in the Protestant Christian Church.

Back in College, Matthew had planned to go to medical school but decided on basic biology and found laboratory research to be more 'fun'. He moved into immunology in graduate school.

Despite being courted by many top ranking research institutes, Matthew says he and Melissa were looking for a change that offered the best combination of exciting living with an innovative Institute offering shared laboratory facilities.

He says at a time when most Institutes are contracting he saw expansion at WEHI.

Matthew and his wife celebrated their 4th Wedding Anniversary in Melbourne in March 2011. They are both looking forward to the relaxed living in Melbourne as well as the mixture of social, culture and professional contacts.

Other VESKI Innovation Fellowship recipients:

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Dr Alyssa Barry PhD
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Professor Sarah Hosking PhD
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For further information visit www.veski.org.au

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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.



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