



Tapping into nature for tailored relief stopping pain at the source

Pain is a major medical and socio-economic issue affecting one in five Australians.

Chronic pain can have many different causes such as cancer, inflammation, chemotherapy or nerve damage, and in some cases, there is no discernible cause at all. Despite the frequency and severity of chronic pain, there is currently only a limited number of medicines available to reduce the suffering of those afflicted.

Pain killers currently available often do not work very well and also cause serious side effects. For example, opioids such as morphine and codeine can result in addiction, breathing difficulties and sedation. With recent restrictions on the sale of codeine, accessing adequate pain relief is now even more challenging.

Pain typically originates in pain-sensing nerves found throughout our bodies; but while all pain has similar symptoms, it is becoming clear that the underlying cause behind pain can vary.

Combating the issue directly at the pain-sensing nerves.

IMB's Professor Irina Vetter believes venom could yield the secret to developing novel pain killers. Her team recently discovered a compound found in the venom of a tarantula that selectively blocks pain-sensing nerves.

This not only reduces pain, but also the dose of opioids needed to provide pain relief. Importantly, the compound does not affect other sensations, like touch, which means it has exciting prospects as a pain drug.

Spider venoms are comprised of a complex mix of compounds that together act to rapidly immobilise prey by targeting their nervous system. These master insect killers have been around for 400 million years, however emerging technologies have recently made it possible to analyse the individual compounds found in animal venoms and learn more about how these compounds interact with the nervous system.

Notably, while an injection of venom kills insects and can also affect mammals, individual components of the same venom can act as powerful pain killers in humans.

Impact and outcomes

By targeting pain at its source, we could not only achieve better pain control, but also reduce the side effects that often arise elsewhere in the body following a dose of medicine.

We aim to improve the quality of life for millions of Australians who live with chronic pain every day.

Researcher profile

Professor Irina Vetter

Professor Irina Vetter, a trained pharmacist, has been conducting research in the fields of peripheral pain mechanisms, target identification and analgesic drug discovery. Irina has been promoted to Director of the Centre for Pain Research and Group Leader of the Chemistry and Structural Biology Division within the Institute for Molecular Bioscience.

She uses toxins isolated from venomous animals to investigate the contribution of ion channels to sensory neuronal physiology.

In collaboration with Dr Thomas Durek (an expert in nature and chemistry), her research group is harnessing the unique biodiversity of Australian venomous plants and wildlife to deliver more effective pain killers, without harmful side effect.

The team combine considerable expertise in basic, pre-clinical and translational research.

Your opportunity to support game changing research at IMB

The following details a sample of how giving to UQ's Institute for Molecular Bioscience research can support our drive to develop pain therapies for 1 in 5 people suffering debilitating pain.

\$2,500	Enables greater quantities of the potential treatment to be produced for further testing.
\$5,000	Provides vital digital engagement training for our researchers to effectively showcase the Centre's discoveries internationally for broader impact.
\$10,000	Supplies the scientific materials necessary for one team member's research investigations for up to one year.
\$50,000	Ignites further pre-clinical studies required to advance our compound to the clinic.
\$250,000	Could advance new pain treatments to clinical trials, and support continued research into new ways to treat chronic pain.

We welcome your suggestions for other ways to support IMB's research that reveals the best ways to translate research to prevent side effects from chemotherapy but also improve treatment outcomes for children globally.

For more information contact:

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“When I was 10 my parents gave me a book about how penicillin was discovered. Since then I found the process of drug discovery absolutely fascinating and I knew I wanted to be a scientist.”

I studied Pharmacy because I wanted to understand how medications interact with the body and during an honours project I became hooked on research.”

Professor Irina Vetter

Institute for Molecular Bioscience



#1 Australian research institute, based on the Nature Index



1454 international collaborators from 48 countries



>20% of patent families at UQ are derived from IMB research