

Bacterial toxins provide new weapon in fight against insects

2 August 2013

A team of Australian and New Zealand researchers are harnessing bacteria as a possible new bio-insecticide to control crop pests.

The team, which includes Dr Michael Landsberg from The University of Queensland's [Institute for Molecular Bioscience](#), investigated the workings of *Yersinia entomophaga*, a bacteria that kills a range of insect species that damage crops.

In the process, the researchers discovered an entirely new way in which cells produce and store toxins.

The team, led by Drs Shaun Lott from AgResearch and the University of Auckland and Mark Hurst from AgResearch together with Jason Busby from the University of Auckland, Dr Santosh Panjekar from the Australian Synchrotron and Dr Landsberg, published their findings overnight in leading scientific journal *Nature*.

" We showed that the bacteria manufactures a giant, hollow protein shell that encapsulates the toxin, much like a protective canister that is only opened when specific environmental conditions are encountered," Dr Landsberg said.

" This explains how the bacteria can produce toxins without harming themselves – the toxins are secured in the protein shell and released at an appropriate time, which is what kills the insect.

Dr Landsberg said the bacteria's ' blueprint' for producing this canister uses a repeating protein sequence that is found in large numbers in other bacteria and animals.

" While the sequence encoding the shell is conserved across species, the toxins or other encapsulated molecules can be quite different," he said.

" Our studies suggest we may have found a molecular assembly manual that bacterial and animal cells alike use to manufacture a generic canister for the protection of toxic or sensitive molecules.

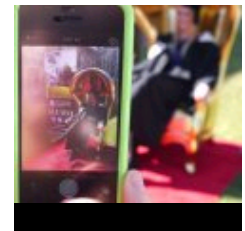
" This has implications for research into human disease as well as pesticides."

The bacteria was originally discovered in the native New Zealand grass grub by Dr Mark Hurst from AgResearch in Lincoln, but it was the discovery that it also affected insects such as the diamondback moth, which damages crops worldwide, that piqued the team's interest.

To donate to IMB's insecticide research please visit www.imb.uq.edu/donate or call (07) 3346 2132.

The [Institute for Molecular Bioscience \(IMB\)](#) is a research institute of The University of Queensland that aims to improve quality of life by advancing personalised medicine, drug discovery and

RECENT HEADLINES



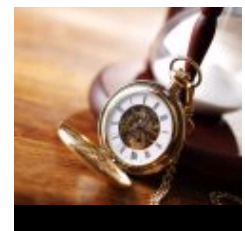
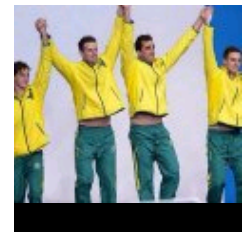
UQ hits social media

milestone 28
July 2014



Hot exhibit

highlights Queensland architecture
25 July 2014



Time out for

AgResearch is New Zealand's largest Crown Research Institute and partners with the pastoral sector to identify and deliver the innovation that is needed to create value for the country.

[More headlines](#)

Media: Bronwyn Adams, IMB Communications Officer 0418 575 247 or 07 3346 2134 or b.adams@imb.uq.edu.au

Share link:

<http://tinyurl.com/mz489e>



Subscribe to the UQ News weekly newsletter

Subscribe

[Home](#) › [Bacterial toxins provide new weapon in fight against insects](#)

Brisbane St Lucia, QLD 4072
+61 7 3365 1111

Other Campuses: [UQ Ipswich](#),
[UQ Gatton](#), [UQ Herston](#)

[Maps and Directions](#)

© 2014 The University of Queensland

A MEMBER OF

edX

GROUP OF EIGHT

[Privacy & Terms of use](#) | [Feedback](#)

Authorised by: Director, Office of Marketing and Communications
ABN: 63 942 912 684
CRICOS Provider No: 00025B

QUICK LINKS

- [For Media](#)
- [Emergency Contact](#)

SOCIAL MEDIA

NEED HELP?

EMERGENCY
[3365 3333](#)

EXPLORE

- [Giving to UQ](#)
- [Faculties & Divisions](#)
- [UQ Jobs](#)
- [UQ Contacts](#)
- [Services & Facilities](#)
- [Login](#)