Media Release

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Resistance is futile – researchers develop 'smart' insecticides

Scientists at The University of Melbourne are making steps towards the development of "smart" insecticides – insecticides designed to minimise the potential for resistance and to be more environmentally friendly.

Associate Professor Phil Batterham, along with Dr Trent Perry and Dr Phil Daborn of the Centre for Environmental Stress and Adaptation Research (CESAR), are investigating the genetic basis of resistance to insecticides that has arisen in pests like sheep blowflies, cat fleas, cotton bollworm and mosquitoes.

"A lot of our work focuses on genes that produce enzymes that break down insecticides – in some ways they're like the insect's defence system. If mutations arise changing where or when these genes are active in the insect, or even how active they are, this can lead to resistance", Dr Daborn says.

The group hopes to use the information about which genes can cause resistance to aid in the design of new insecticides that will get around this defence system.

The production of more effective insecticides will reduce the amount that is required to control insect pests, saving the agriculture industry money, improving human health and reducing the environmental impact of insecticide use.

Others members of the group are looking at the genes that are actually targeted by insecticides. If mutations in these genes change the ability of the insecticide to act through them, this can also lead to resistance.

Information on the common target genes of insecticides may reveal important differences in these genes between different insect species.

"The problem with many existing insecticides is collateral damage – non harmful or even beneficial insects that are also killed by the insecticide. By exploiting genetic differences between the pests and these other insects, it may be possible in the future to design smart insecticides that discriminate between them', Dr Perry says.

“We are keen to take the fight up to the insects, overcoming their defences and exploiting their weaknesses”, says Assoc Prof Phil Batterham.

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