Til' death do us part – in the plant world

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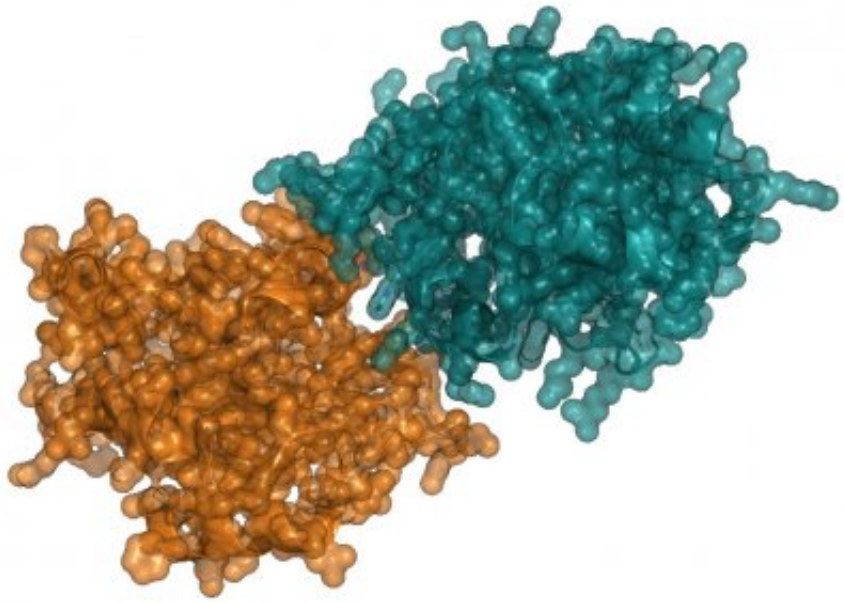

Molecular structure of interacting protein molecules involved in plant disease resistance.

(Phys.org) —A landmark study from The University of Queensland has described the ultimate act of sacrifice and survival, in the plant world.

The research sheds light on how the plant immune system provides resistance against common plant diseases and has been published in *Science*.

Co-first author Dr Simon Williams from UQ's School of Chemistry and Molecular Biosciences said the international team's unique findings describe how a pair of plant proteins fights back.

"When these proteins are disturbed by an infection, the infected cell dies allowing for the immunity of the entire plant," Dr Williams said.

"In this remarkable process the entire plant becomes immune at the expense of few noble cells. We detail how plant protein immune receptors regulate each other and coordinate a response when threatened by infection."

Research leader Professor Bostjan Kobe said that while many plant resistance genes have been identified in the past two decades, scientists have limited knowledge of how they work.

"It is vitally important that we understand how plant immune systems function because pre-harvest plant diseases account for up to 15 per cent of crop loss every year," Professor Kobe said.

"This is a significant economic and environmental challenge for a world already under pressure to produce more food, fibre and biofuels."

The study could also fuel future research in human health, as there is significant overlap between the mechanisms that plants and humans use to detect and respond to disease.

"To help our understanding of the plant interactions we used x-ray crystallography techniques to determine protein structures at near-atomic

resolution at the Australian Synchrotron," said Professor Kobe.

"We are particularly pleased as 2014 is the International Year of Crystallography and this project is a great example of how crystallography can contribute to diverse fields, including plant immunity."

More information: "STRUCTURAL BASIS FOR ASSEMBLY AND FUNCTION OF A HETERODIMERIC PLANT IMMUNE RECEPTOR." *Science* 18 April 2014. Vol. 344 no. 6181 pp. 299-303. DOI: 10.1126/science.1247357

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