

Why plants panic when it rains

October 29 2019, by Harvey Millar



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An international team of scientists involving The University of Western Australia's School of Molecular Sciences, the ARC Centre of Excellence in Plant Energy Biology and Lund University has made the surprising discovery that a plant's reaction to rain is close to one of panic.

The research, published in *Proceedings of the National Academy of Sciences*, revealed complex [chemical signals](#) are triggered when [water](#) lands on a plant to help it prepare for the dangers of rain.

UWA Professor Harvey Millar said after spraying plants with water and observing the effect, the researchers noticed a [chain reaction](#) in the plant caused by a protein called Myc2.

"When Myc2 is activated, thousands of genes spring into action preparing the plant's defences," Professor Millar said. "These warning signals travel from leaf to leaf and induce a range of protective effects."

"As to why plants would need to panic when it rains, strange as it sounds, rain is actually the leading cause of disease spreading between plants."

"When a raindrop splashes across a leaf, tiny droplets of water ricochet in all directions. These droplets can contain bacteria, viruses, or fungal spores. A single droplet can spread these up to 10 metres to surrounding plants."

Evidence also suggests that when it rains, the same signals spreading across leaves are transmitted to nearby plants through the air.

"One of the chemicals produced is a hormone called [jasmonic acid](#) that is used to send signals between plants," Professor Millar said.

"If a plant's neighbours have their defence mechanisms turned on, they are less likely to spread disease, so it's in their best interest for plants to spread the warning to nearby plants.

"When danger occurs, plants are not able to move out of the way so instead they rely on complex signalling systems to protect themselves."

Professor Millar said it was clear [plants](#) had an intriguing relationship with water, with [rain](#) a major carrier of disease but also vital for a plant's survival.

More information: Alex Van Moerkercke et al. A MYC2/MYC3/MYC4-dependent transcription factor network regulates water spray-responsive gene expression and jasmonate levels, *Proceedings of the National Academy of Sciences* (2019). DOI: 10.1073/pnas.1911758116 , www.pnas.org/content/early/2019/10/25/1911758116

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