Biography

Will completed his Bachelor of Science (majoring in Genetics and Botany) and Honours (Botany) at UWA. His Honours project was based at Kings Park Science, where he studied the population genetics of a critically endangered native plant. He then worked for a year at the Department of Biodiversity, Conservation and Attractions in the Species and Communities Program. In March 2020, he joined the Batley Lab to undertake his PhD.

Research Interests

Plant genetics and genomics, plant disease resistance, R-gene identification, target enrichment sequencing

Current Project

Several fungal diseases cause severe yield loss to the canola industry worldwide, including blackleg, white rust and white leaf spot. To control these diseases, methods such as the application of fungicides and specific agronomic practises are typically employed. However, host resistance is the most cost-effective and sustainable way to manage disease. The objective of my PhD is to identify and validate new resistance genes (R-genes) which will provide protection from disease. A new approach to identify R-genes, R-gene enrichment sequencing or RenSeq, will be utilised. RenSeq and its descendant RLP/KSeq, allow for the identification of NLR, RLP and RLK class R-genes without a reference genome. This promising technique will be used to capture the genome wide repertoire of resistance gene analogs (RGAs) in different Brassica germplasm. A combination of association genetics and RenSeq, termed AgRenSeq, will also be used to identify R-genes that provide qualitative resistance to blackleg, white rust and white leaf spot. The discovery of new R-genes will facilitate breeding programs to develop disease resistance cultivars and increase the genetic diversity in cultivar rotation.

Publications

**William J W Thomas**, Janet M Anthony, Mark P Dobrowolski, Siegfried L Krauss, Optimising the conservation of genetic diversity of the last remaining population of a critically endangered shrub, AoB PLANTS, Volume 13, Issue 1, February 2021, plab005, <https://doi.org/10.1093/aobpla/plab005>

Zhang Y, **Thomas W**, Bayer PE, Edwards D, Batley J. Frontiers in Dissecting and Managing *Brassica* Diseases: From Reference-Based RGA Candidate Identification to Building Pan-RGAomes. International Journal of Molecular Sciences. 2020; 21(23):8964. <https://doi.org/10.3390/ijms21238964>

Awards

•Australian Government Research Training Program (RTP) Scholarship

•Grains Research and Development Corporation (GRDC) Research Scholarship

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