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Genes, Hide-and-Seek, and Masks: *what's there in common in host pathogen interactions*

Dilantha Fernando

Dilantha.fernando@umanitoba.ca

Department of Plant Science, University of Manitoba, Winnipeg, Manitoba, R3T 2Nt, Canada

Host-pathogen interactions have become more interesting to investigate with molecular tools and new technologies being available, such as next generation sequencing. My lab focuses on the two most economically important crop diseases in Canada, studying the host-pathogen interactions of the Canola-Blackleg pathosystem, and the Wheat/Barley-Fusarium pathosystem at the molecular level. The presentation will discuss how genes in both the host and pathogen interact, and how some genes have found a way around to not be detected by the host or the pathogen. The AvrLm3 avirulence genes, and AvrLm9 avirulence gene's phenotype with the host are masked in the presence of the AvrLm4-7 gene in the pathogen allowing a phenotype of virulence in farmers' fields. This will make the Rlm3 and Rlm9 resistance genes in the canola plant ineffective in the field. The presentation will also discuss how the deoxynivalenol (DON) mycotoxin is converted by the hosts barley and wheat to a less toxic DON_3-glucoside (DON-3-G), which would go undetected in the grain flour, when tested with mycotoxin detection methods at the elevator. This new form of the mycotoxin can be converted back to DON in human and animal gut, by gut microorganisms. This conversion by the host (from DON to DON-3-G) is done as a resistance to the toxin, but as DON-3-G goes undetected into the food system, it may have an adverse effect on human and animal health. The presentation will discuss how such findings were carried out in my lab, and what recommendations have been put forward to the industry.