Zuhra Qayyum

Biography

I have a Master's degree in Plant Biotechnology from the National University of Sciences and Technology (NUST) Pakistan. During my master’s our group worked on the identification of *stilbene* synthase genes in *Arachis hypogaea*. My research was aimed at studying the role of hormones (SA, JA) on the expression of *stilbene synthase* genes. In October 2022, I joined Batley Lab as a PhD student. I am currently working on the functional characterisation of resistance genes in *Brassica napus* against *Leptosphaeria maculans* infection.

Research Interests

Molecular Biology, Signalling, Biotic and Abiotic stresses in Plants, Gene editing.

Current Projects

**Functional characterisation of resistance genes in *Brassica napus* against *Leptosphaeria maculans* interaction.**

Brassica napus is grown around the world due to its economic, agronomic, and nutritional value, as well as its versatility in various agricultural systems. It is infected by fungal pathogen Leptosphaeria maculans and it reduces the crop yield by 50 % when infected on a large scale. The fungal infection in the plant is controlled by the presence of several resistance (R) genes that initiate a cascade of pathways limiting the pathogen to the site of infection. Each resistance gene recognises a corresponding avirulence (Avr) gene produced by the fungus to initiate defence signalling. Successful attempts have been made to improve crop yield by growing resistant varieties of canola. However, the resistance to fungus is overcome by growing cultivars with the same resistance gene continually over a few years, as has been observed in Canada and Australia. One solution to this problem is the identification and characterization of more resistance genes in canola. Up until now, 19 resistance genes have been identified, with only five genes cloned and functionally characterised. These genes are found to be race specific. Among the identified resistance genes, the LepR1 and Rlm3 genes are also of immense importance due to their role in regulating plant defence responses. This study aims for functional characterisation of candidate LepR1 and Rlm3 genes to validate their function in canola plant resistance against L. maculans. This would help to develop effective strategies to combat the fungal pathogen, increase crop yield, and enhance food security.

Publications

Qayyum, Z., Noureen, F., Khan, M., Khan, M., Haider, G., Munir, F., ... & Amir, R. (2022). Identification and expression analysis of stilbene synthase genes in Arachis hypogaea in response to methyl Jasmonate and salicylic acid induction. Plants, 11(13), 1776.

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Liaqat, N., Liaqat, A., Ali, M., Qayyum, Z., Amir, R., Siddique, R., ... & Budak, H. (2020). Wheat genomics and genome editing. In Climate Change and Food Security with Emphasis on Wheat (pp. 331-346). Academic Press.

Fatima, Z., Qayyum, Z., Anjum, B., Riaz, S., & Gul, A. (2023). Alterations in metabolic profiling of crop plants under abiotic stress. In Phytohormones and Stress Responsive Secondary Metabolites (pp. 197-233). Academic Press.

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