

B2

Investigation of the interaction between phages, bacteria and plants

Ines
Friedrich

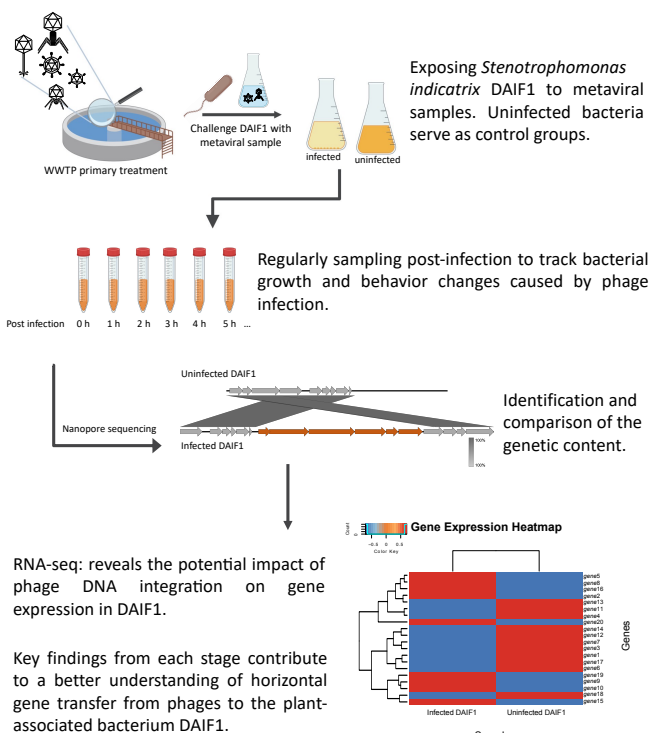
State of the art

- Bacteria-plant interactions span mutualistic to pathogenic, impacting plant growth.
- Certain bacteria enhance plant growth through growth-promoting substances, nutrient uptake, and pathogen protection.¹
- Phages, bacterial viruses, crucially influence bacterial dynamics.^{2,3}
- Presence of phage-like genes in plant genomes suggests a potential link between phages and plants.
- Phage DNA incorporation into plant genomes raises questions about horizontal gene transfer and evolutionary implications.

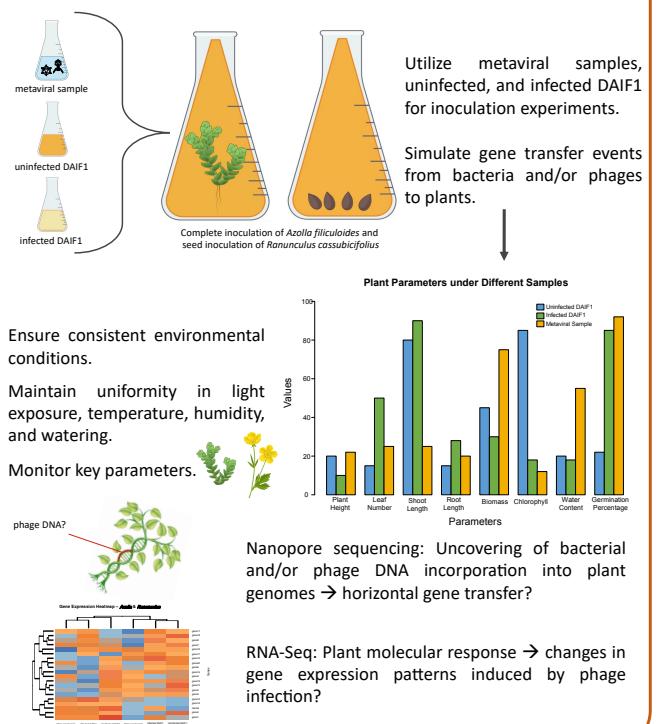
Objectives

- Investigate phage-mediated gene transfer, its impact, and horizontal transfer in plant-associated bacteria.
- Perform infection assays, metagenomic sequencing, gene expression analysis, and study DNA incorporation into plant genomes.
- Examine evolutionary advantages, functional implications on genetic and physiological levels, and monitor plant growth parameters and transcriptome changes using RNA-Seq.

PhD 1 – Investigating phage-mediated gene transfer in plant-associated bacteria



PhD 2 – Exploring Horizontal Gene Transfer: Interaction between Bacteria, Phages, and Plants



References

1. Kumar R, Sharma AK, Ahluwalia SS. 2017. Advances in Environmental Biotechnology.
2. Abedon ST. 2008. Bacteriophage Ecology: Population Growth, Evolution, and Impact of Bacterial Viruses: Cambridge University Press.
3. Kutter E, Sulakvelidze, A. 2004. Bacteriophages: biology and applications. Boca Raton: CRC Press.

RTG
2984/1