Bachelor or Master thesis BIOVIT 2023/24

Topic/Title (Norwegian)

Konvergent molekylær evolusjon av frost toleranse i sørlige gress (Danthonioideae)

Topic/Title (English)

Convergent molecular evolution of frost tolerance in southern hemisphere grasses (Danthonioideae)

Summary

Recent molecular studies have shown how the major grass group in the Northern hemisphere (Pooideae) have evolved cold and frost tolerance over millions of years. Most other grasses are not able to survive in cold climates. Except the Danthoniodeae, a small group of temperate, Southern hemisphere grasses. In our research group we have accumulated ecophysiological data that proves that Danthonioideae possess similar adaptations as their relatives in the North. However, we have no idea which genes and molecular pathways are involved in the Danthonioideae's frost tolerance and if the cold response pathways are the same as the ones studied in Pooideae. In this project we aim to assemble the first ever genome for the species *Danthonia decumbens* and use transcriptomic data to explore the global gene expression during cold acclimation. We will test if a certain group of transcription factors has gained a role in the Danthonioideae's forst tolerance and thereby gain meaningful insights into the convergent molecular evolution of plant adaptations.

Potential candidates are expected to mainly learn and perform bioinformatic methods to assemble and analyze genomic and transcriptomic data. This project is a collaboration with Assoc. Professor Aelys Humphreys at Stockholm University.

Subject area

Genomics, transcriptomics, molecular evolution, ecophysiology

Language thesis

English

Bachelor or Master thesis

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Master thesis

Credits

60

Please contact

marian.schubert@nmbu.no