



PhD position (100%, fixed term)

DNA-based analysis of species composition and genetic diversity in multispecies swards

We offer a position for a doctoral student in the Molecular Plant Breeding group at ETH Zurich as part of the LegumeLegacy international doctoral network. The doctoral student will develop and apply molecular genetic tools to monitor species composition and genetic diversity in the multi-site experiment implemented by LegumeLegacy partners. The position is for 3-4 years, starting 1st September 2023.

Project background

LegumeLegacy is a Marie Skłodowska-Curie Doctoral Network (Horizon-MSCA-DN-2021) titled 'Legume Legacy – Optimising multiple benefits of grass, legume and herb mixtures in crop rotations: modelling mechanisms and legacy effects'. This project brings together Principal Investigators and collaborators from 14 academic and industry partners from across Europe and one Canadian partner. LegumeLegacy will hire and train eleven Doctoral Researchers and will implement a research programme aimed at improving the sustainability of farm-scale crop rotations. The role of multi-species grassland mixtures within crop rotations will be investigated in the search for solutions to develop lower nitrogen farming systems that will promote sustainable farming practices. LegumeLegacy is a highly interdisciplinary collaboration bringing together experts in ecology, agronomy, plant breeding, animal nutrition and statistics. The Doctoral Researchers will undertake a world-class training programme developed and implemented by the LegumeLegacy collaborating experts and will meet twice per year to participate in joint training events.

Job description

The overall aim of the doctoral project is to develop and apply molecular genetic tools to investigate species composition and genetic diversity in the LegumeLegacy multi-site experiment. Approaches will be based on (but not limited to) DNA barcoding, amplicon sequencing and genotyping-by-sequencing or whole genome (skim) sequencing. Methods will be applied to monitor genetic diversity within selected species over time to determine the stability of cultivar mixture across seasons and years and relate changes with the development and performance of multispecies swards. The project will apply state-of-the-art molecular genetics, bioinformatics and statistical approaches to gain a deeper understanding of the genetic diversity and intra-species relationships in managed grassland. You will be able to learn and apply a broad set of methods and technologies and profit from the interdisciplinary interactions within the doctoral network. Furthermore, you will be enrolled at ETH Zurich and work at the forage crop hub of the Molecular Plant Breeding group, located at Agroscope Reckenholz, 8046 Zurich, Switzerland. In addition, you will be expected to undertake two mobility secondments during their studies, facilitating them to develop a deep collaborative network. The salary for the position corresponds to the 2021 MSCA Doctoral Network funding model.

Your profile

You should have a master's degree in plant genetics, agronomy or plant biology with a strong focus on molecular genetics, genomics and statistics. Solid knowledge of the R programming language as well as a basic knowledge of command-line programming and bioinformatics is a prerequisite. Wet lab experience is preferable and the willingness to acquire missing skills is indispensable. Furthermore, you should have a strong interest in plant genetics and agronomy and be willing to develop and apply state-of-the-art methods and analysis pipelines. Strong writing and communication skills in English are essential and

knowledge of German and/or French is an advantage. A strong understanding of European grassland agriculture is indispensable.

The following 2021 MSCA Doctoral Network eligibility criteria must be met:

- You must be an 'early-stage researcher', i.e., at the time of recruitment have not already been awarded a doctoral degree.
- You are required to undertake physical, transnational mobility (i.e. move from one country to another) to take up this appointment.
- You must not have resided or carried out your main activity (work, studies, etc.) in Switzerland for more than 12 months in the 3 years prior to their recruitment. Compulsory national service and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.

About us

ETH Zurich is one of the world's leading universities specialising in science and technology. We are renowned for our excellent education, cutting-edge fundamental research and direct transfer of new knowledge into society. Over 30,000 people from more than 120 countries find our university to be a place that promotes independent thinking and an environment that inspires excellence. Located in the heart of Europe, yet forging connections all over the world, we work together to develop solutions for the global challenges of today and tomorrow.

ETH Zurich is a family-friendly employer with excellent working conditions. You can look forward to an exciting working environment, cultural diversity and attractive offers and benefits (Working, teaching and research at ETH Zurich). In line with our values, ETH Zurich encourages an inclusive culture. We promote equality of opportunity, value diversity and nurture a working and learning environment in which the rights and dignity of all our staff and students are respected. Visit our Equal Opportunities and Diversity website to find out how we ensure a fair and open environment that allows everyone to grow and flourish

Curious? So are we.

We look forward to receiving your online application consisting only of the two following documents:

- Document 1 should include:
 - A maximum 1-page cover letter outlining your suitability for the post, with reference to relevant qualifications or experience;
 - Detailed curriculum vitae, including qualifications and experience, publications (if applicable) and the name and email contacts of three academic or professional referees.
 - Transcripts of degrees;
 - A maximum 1-page statement outlining your research project experience to date (this can be related to undergraduate or postgraduate research projects and/or research work experience etc.);
 - All four items above should be compiled into a *single* pdf document and not exceed a maximum number of ten pages.
- Document 2:
 - Please complete the LegumeLegacy eligibility form available here and convert it to pdf before submission.

Please note that we exclusively accept applications submitted through our online application portal. Applications via email or postal services will not be considered. Further information about the Molecular Plant Breeding group can be found on our website or on twitter @MolecPlantBreed. For further information, please contact Dr Roland Köllliker or email roland.koelliker@usys.ethz.ch (no application documents).