



## LINKING ENVIRONMENTAL STRESS TO TRANSPOSABLE ELEMENT ACTIVITY

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We are offering a four year **PhD position at the Department of Plant and Microbial Biology, University of Zurich** under the supervision of Prof. Anne Roulin and Dr. Michael Thieme (for more on the group: <https://www.botinst.uzh.ch/en/research/evogenomics/roulin.html>).

### Background

Transposable elements are mobile DNA sequences that constitute the main component of most eukaryotic genomes. TEs are also functionally important as they can lead to the creation of alternative or new promoters, the rewiring of regulatory networks and the alteration of epigenetic landscapes. While their mobility is normally restricted by a sophisticated silencing machinery implemented by their hosts, external stresses, however, can lead to their mobilization and induce stable transgenerational genetic changes. TEs may thus be especially prone to produce the raw diversity necessary for individuals to respond and adapt quickly to new or changing environmental conditions. Hence, the stress-induced mobilization of TEs is increasingly seen as one of the major drivers of phenotypic diversity and plant evolution.

### Aims of the project

We have previously developed a method to circumvent the strict epigenetic regulation of TEs in plants. This allowed us for the first time to study the effects of stress-induced transposition events in *Arabidopsis thaliana*. We were able to show that the stress-induced mobilization of a heat responsive TE indeed caused a broad panel of phenotypes and an altered response to environmental cues such as day length.

Using the same approach, your PhD project will aim at studying the mechanisms of TE-mobility in the model plant *Brachypodium distachyon*. By tracking TEs in various accessions from different habitats, we want to observe and understand TE-mediated evolution in real-time. These findings will make a major contribution towards the understanding of the adaptive potential of TEs and will have direct implications for the use of TEs in plant breeding programs, as *B. distachyon* is closely related to major crops.

### You are ...

... interested in plant (epi)genetics/physiology/ecology/evolution and willing to develop skills in molecular biology and bioinformatics. You will be encouraged to come up with your own ideas and creativity in order to shape your PhD project according to your interests. The successful candidate must hold a master degree in biology (or in a related field).

### How to apply ?

Send a PDF file including a cover letter, a CV, and contact information of 2 referees to [anne.roulin@botinst.uzh.ch](mailto:anne.roulin@botinst.uzh.ch) **AND** [michael.thieme@botinst.uzh.ch](mailto:michael.thieme@botinst.uzh.ch) before 31.12.18. For more information or to visit the lab, don't hesitate to contact us.