MOLEKULARES DESIGN VON DÜRRETOLERANZ AM BEISPIEL DER SOJABOHNE

Lead partner:
Universität für Bodenkultur Wien

Scientific management:
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Additional participating institutions:
Institute of Science and Technology Austria (IST Austria)

Research field:
Ökosysteme und Ökosystemdienstleistungen
Wasser
Nachwachsende Rohstoffe und Bioenergie
Lebensmittel- und Futtermittelsicherheit
Nachhaltige Landbewirtschaftung und Produktionsoptimierung

Funding tool: Basic research projects

Project-ID: FTI19-008

Project start: will follow

Project end: will follow

Runtime: 36 Monate / ongoing

Funding amount: € 177.025,00

Brief summary:
Water deprivation as a consequence of changing environmental parameters, represents one of the most immanent problems for agriculture. This, of course, has far-reaching consequences, not restricted merely to crop plants on farmland, but thus affects the most vital resource for a functional society – food supplies. Conventional breeding approaches aimed at the generation of drought-tolerant crops combined with all necessary parameters of elite germplasm, made substantial progress in recent decades. However, current drastic climate changes that we are experiencing, for example in Middle Europe, ask for a swift reaction. Innovative approaches, employing genetic engineering of crop plants, would give rise to a range of transgenic crop plants well adapted to environmental stress conditions. Nevertheless, owing to legislative and -perhaps even more relevant- limited public acceptance, it seems highly unlikely that GMO crops will find their way onto local farmland. Here, we intend to make use of results from basic research obtained in the model plant Arabidopsis thaliana, which will be adapted for molecular breeding in order to generate drought-tolerant crops. Specifically, by combining expertise from the BOKU campus Tulln and the IST-Klosterneuburg, we propose to generate drought tolerant soybean, via modifying the activity of a plant-specific group of genes. This approach is based on state-of-the art CRISPR/Cas9-based gene editing and shall produce novel soybean cultivars that will be tested for drought responsiveness and further vital growth parameters. Once such a proof-of-principle has been provided, it is intended to identify naturally occurring genetic variations from accessible collections of soybean varieties, which will serve as a solid foundation for generation of GMO-free elite germplasm capable of coping even with drastic changes in our environment.