



Master's degree project in plant genetic engineering.

Available earliest in June 2018.

Contact:

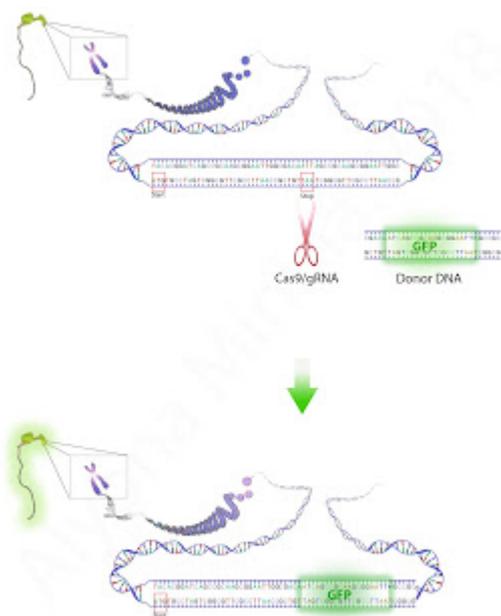
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In our group we are currently focusing on [investigating the molecular machinery of plant autophagy](#).

We are looking for a highly motivated student who is interested in **joining our group to**

optimize [CRISPR-Cas9 system](#) for [knock-in](#) modification of plant genes.



An example of CRISPR-Cas9 driven knock-in.

A stop codon of a gene in *Arabidopsis* genome is replaced with a DNA sequence encoding the Green Fluorescent Protein (**GFP**). The resulting plant expresses a GFP fusion of the endogenous protein.

Most of the current plant molecular biology studies still rely on the use of crude genetic engineering tools that dramatically limit the capacity of our research. [The recent advances in the use of CRISPR-Cas9 system for plants](#) give very promising results that still require some significant modifications.

In this project we aim to optimize the CRISPR-Cas9 for precise knock-in modification of *Arabidopsis* genes and use the new tool to make reporter lines for detection of plant [autophagy-related \(ATG\)](#) genes activity.

This project, in general, will open up a broad range of new possibilities for investigating plant gene function and in particular, will make a significant contribution to our understanding of ATG-genes regulation.

Project goals

1. Establish proof of concept constructs for knock-in modification of *Arabidopsis thaliana* genes in protoplasts
2. Create a set of constructs for knock-in modification of genes important for regulation of autophagy in *Arabidopsis thaliana*
3. Participate in establishing transgenic lines by knocking in green fluorescent protein and luciferases into *Arabidopsis* genome

You will acquire skills in

1. Genetic engineering
2. Use of CRISPR-Cas9 in plants
3. Advanced DNA and protein molecular biology methods
4. Advanced confocal microscopy
5. Plant transformation
6. Handling typical plant model organisms: *Arabidopsis thaliana* plants and tobacco cell cultures