Master's Thesis in Plant Biotechnology

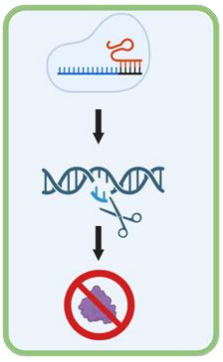
1. **Using CRISPR technology for development of crops with improved shelf life and pathogen defense**

Sclerotinia sclerotiorum infection on lettuce

Late blight on potato

Scab on apple

Each year, 20-40 % of global crop production is lost to pathogens such as fungi, bacteria, viruses, and oomycetes, as well as pests like insects and nematodes. This loss poses a major threat to farmers' economic stability and global food security. We are currently using CRISPR technology in apple, potato and lettuce to improve shelf life and pathogen defense by editing genes that negatively regulate these processes. Our goal is to develop resilient crops to reduce yield loss, food waste and the need for chemical pesticides. In these projects, we identify candidate genes to be edited by RNA-sequencing and transform plant cells with CRISPR/Cas9-constructs containing small, specific guide-RNAs that directs the Cas9-enzyme to the right gene. After the editing process, the plant cells are cultivated *in vitro* and eventually regenerated into mature, and hopefully, improved plants.



CRISPR-Cas9 editing of plant genes

You will learn: Standard molecular techniques such as RNA and DNA isolation, PCR and RT-qPCR, cloning, pathogen infection assays, CRISPR/Cas9 genome editing, transformation, *in vitro* plant tissue culture techniques and bioinformatics.

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