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Using High-throughput Phenotyping to Characterize the *srfr1* Arabidopsis Mutant

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As temperatures rise due to climate change and the spread of some pathogens becomes easier, the plant immune system will be even more crucial to crop survival. To know how to mitigate yield loss due to pathogen introduction we need to further understand the immune system. Our focus is SRFR1, which is a negative regulator of immunity in plants. Arabidopsis plants with a non-functional *SRFR1* gene displays stunted growth compared to the wildtype genotype Columbia. This is due to the *srfr1* mutant having a constitutive immune response that comes at the cost of growth. When growing Columbia and *srfr1* mutants side by side they are identical before a stunted appearance manifests. To characterize this phenotype, the root phenotype was analyzed in the mutant by using an inhouse automated image collection platform and an image analysis algorithm. Preliminary results suggest no significant difference in the root growth of Columbia and the *srfr1* mutant. To measure the rosette size high-resolution images were captured every two hours. By doing this we can monitor the plants' leaves in more detail than we could by hand, imaging the plants side by side and pinpointing the exact point in development when *SRFR1* becomes necessary for wild type development. Then using a computer algorithm we will be looking at rosette size and other aspects of the plant to generate a fine temporal resolution of the *srfr1* mutant phenotype. These two experiments will provide more information on the *srfr1* mutant phenotype and its affect on development of arabidopsis.