

# CRISPR Plants: A Course Based Undergraduate Research Experience

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With the rapid advances in gene editing using CRISPR/Cas 9 and associated technologies, undergraduate students are seeking opportunities to learn about and experience this exciting technology. Plant Molecular Biology is a laboratory based upper level elective course at RIT. We describe the development of a course-based undergraduate research experience (CURE) to explore CRISPR/Cas 9 editing in *Arabidopsis thaliana*. Groups of students selected gene targets, designed guide RNAs, produced plasmids containing the guide RNAs, and introduced the plasmids into *Arabidopsis thaliana* using *Agrobacterium tumefaciens*-mediated floral dip transformation. In addition, we performed in vitro assays to determine the ability of our guide RNA sequences to target and cleave template DNA in the presence of Cas 9. Students used a variety of online tools in the project design and designed their own timelines to achieving their goals. We discuss preliminary results as well as further work required to achieve this workflow in a single 14-week semester.

**Keywords:** CRISPR/Cas 9, CURE, *Arabidopsis thaliana*, *Agrobacterium tumefaciens*, undergraduate research

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