

1. Where do you see image analysis fitting into your future project? Are there specific techniques and/or types of data you hope to collect from your images?

My research is based on understanding herbicide resistance in weed species. Many of these resistant weed populations produce fewer reactive oxygen species (ROS) compared to a known sensitive line from the same species. To measure and quantify ROS levels, researchers in my field often use imaging. They basically take photos of plant disks after running an ROS extraction protocol. By looking at the color differences (dark versus white for instance), they can figure out how much ROS is present. I am planning to do the same assay in a resistant population that I am working on.

2. What was the most challenging part of working through the example in CellProfiler? Why was it challenging?

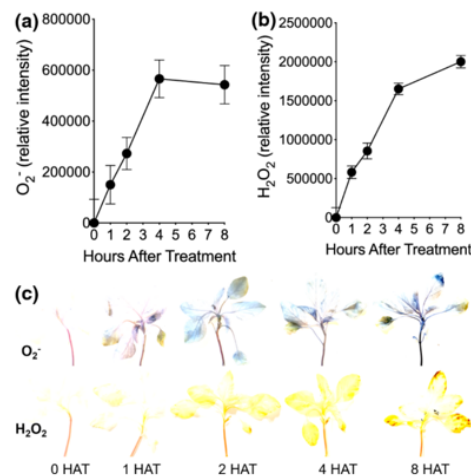
The most challenging was understand how to set each of the parameters to do the pipeline that I intended to analyze. Sometimes I got some errors, but they were not clear what were the reasons. For example, the app doesn't work well if file names have space but will not exhibit the reason for the error.

3. Find an image from a recent paper you read. What type of data did they collect from the image and what technique/software did they use to analyze it? Include references.

The authors measured the relative amount of reactive oxygen species in different plants. The amount of superoxide was quantified using CS3 Photoshop, measuring the color intensity in each leaf disc, removing background levels. The data was represented as relative intensity of treated samples compared to samples that were not treated with herbicide.

Reference:

Takano, H. K., Beffa, R., Preston, C., Westra, P., & Dayan, F. E. (2019). Reactive oxygen species trigger the fast action of glufosinate. *Planta*, 249, 1837-1849.



4. Describe an image analysis platform we haven't discussed in class. What types of images can be analyzed and what types of analysis are possible? Include references.

Photoshop. As discussed in the previous question, they used to quantify the amount of reactive oxygen species generated when plants were treated with herbicides. They measured the color intensity in each leaf discs and compared susceptible and resistant individuals.