

SCIENCE IN THE DARK

How do biologists see things invisible to the naked eye?

Adapted from Reactions' ["How to Make a Fluorescent Flower"](#)



HI, I'M EMILY!

I'm a student in a biology lab at the University of Michigan. I'm going to explain why fluorescent cells are very important in research.

HOW SMALL ARE CELLS?

We can see cells with the help of microscopes, but what if we want to study something inside of them? The molecules in cells, like proteins, are even tinier. Unfortunately, they are also colorless.

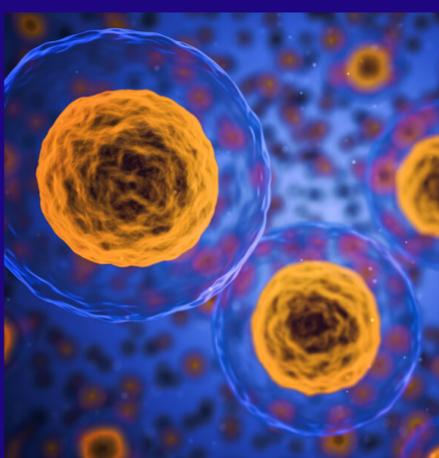


WHAT IS FLUORESCENCE?

Fluorescence is the radiation given off by some molecules when exposed to UV light. Scientists have discovered **green fluorescent protein**, or **GFP**, which fluoresces naturally.

HOW DO YOU MAKE CELLS FLUORESCENT?

Genes in DNA encode proteins. If you put the gene for **GFP** next to the gene of the protein you want to study, the cell will fluoresce when and where these two proteins are made.



WHY ARE PROTEINS IMPORTANT?

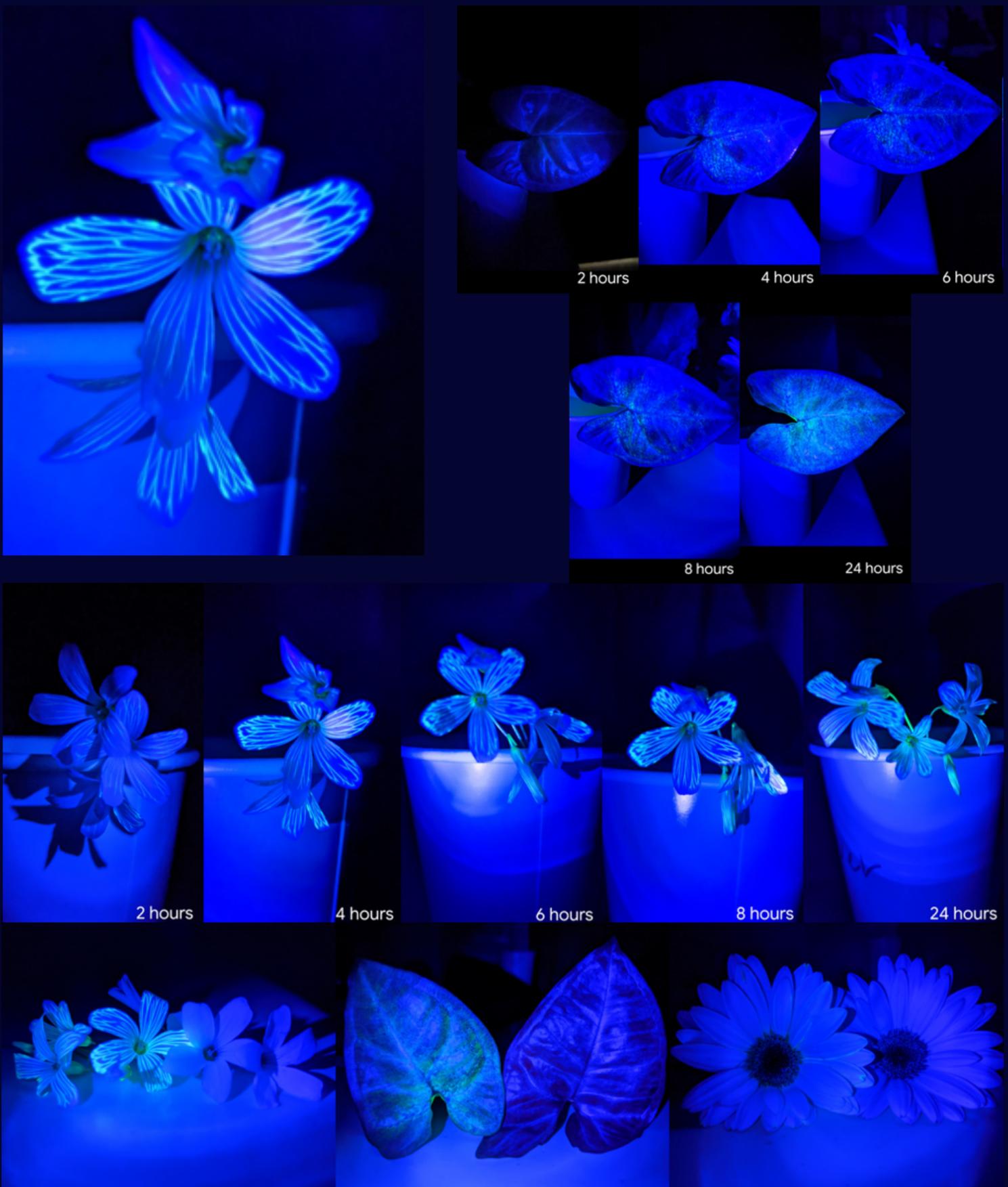
Proteins do a lot of different things! Some proteins control when cells divide. If we use **GFP**, we can see where these proteins are at different timepoints in development.

HOW CAN YOU DO THESE EXPERIMENTS AT HOME?

Highlighter ink is fluorescent! If you mix the ink with some water and put it in a vase, plants will drink it up. Exposing the plants to UV light shows where the ink is. This is the same idea behind using **GFP**: the ink will show us where the water goes, even though water is clear.

HOW DID YOU DO THIS EXPERIMENT?

I took cuttings from three plants, put them in vases with ink and water, and checked them with a blacklight. I compared them to cuttings that had only been in water. Here are some of my photos!



DID YOU TRY THIS EXPERIMENT?

Share your results! Try it with any plants that you're curious about. The full instructions are in the link at the top of the first page. Have fun!

