

Hybrid Plant Project

Your Task

Read through the article below to get ideas about how this worked in the real world. Then create a fictional animal that has merged with a plant and uses photosynthesis now. Answer the questions on the next page about your hybrid, create a drawing (either digitally or physically) of your hybrid, attach a picture of your hybrid and turn in this complete document.

Slugs Becoming Plants?!?

Researchers have recently discovered the first direct evidence that an emerald green sea slug's chromosomes have some genes that come from the algae it eats, allowing the slug to "feed" on sunlight for months at a time. These algal genes help sustain photosynthetic processes inside the slug that provide it with all the food it needs.

The slug represents one of the only known examples of functional gene transfer from one multicellular species to another, which is the goal of gene therapy to correct genetically based diseases in humans.

The team used an advanced imaging technique to confirm that a gene from the alga is present on the slug's chromosomes. This gene makes an enzyme that is critical to the function of photosynthetic "machines" called chloroplasts, which are typically found in plants and algae.

It has been known since the 1970s that the slug "steals" chloroplasts from the algae (in a process called kleptoplasty) and embeds them into its own digestive cells. Once inside the slug cells, the chloroplasts continue to photosynthesize for up to nine months – much longer than they would perform in the algae. The photosynthesis process produces carbohydrates and lipids, which nourish the slug.

How the slug manages to maintain these photosynthesizing organelles for so long has been the topic of intensive study and a good deal of controversy. "This paper confirms that one of several algal genes needed to repair damage to chloroplasts and keep them functioning is present on the slug chromosome," says study coauthor Sidney K. Pierce. "The gene is incorporated into the slug chromosome and transmitted to the next generation of slugs." Although the next generation must take up chloroplasts anew from algae, the genes to maintain the chloroplasts are already present in the slug genome, Pierce says.

This biological adaptation is also a mechanism of rapid evolution. Pierce says, "When a successful transfer of genes between species occurs, evolution can basically happen from one generation to the next," he notes, rather than over an evolutionary time scale of thousands of years.



From an article in the *Marine Biological Laboratory*

What You Need to Do

You will need to answer the following questions about your animal and then create either a physical or digital poster with information to tell the public about your find.

1. What is your animal and why did you pick that animal?
2. What is your plant that will hybrid with your main animal and why did you pick that plant?
3. How did your plant merge with your animal? (What fictional process happened for them to merge?)
4. Is your hybrid dangerous in any way?
5. In the real world, how likely do you think this hybrid would be? Why?

Now that the questions are complete, create a poster (either digitally or physically) to inform the public about your hybrid. Make sure to include a picture and details about how the hybrid uses photosynthesis. Attach your digital poster to this assignment, or take a picture of your physical poster and insert it below.