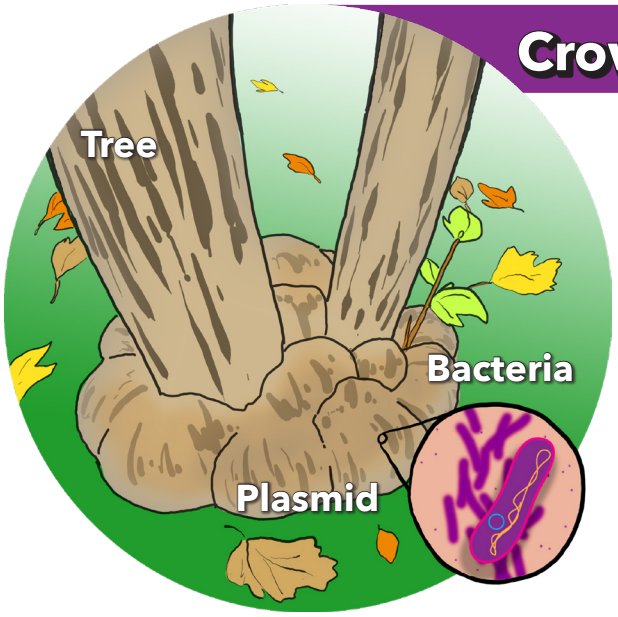
Crown Gall

ECO-TRIO



Crown gall is a tumor that grows on the stems of many kinds of trees and other plants. It's caused by a type of bacteria (A. tumefaciens). The bacteria grow inside the tumor, where it gets food and shelter.

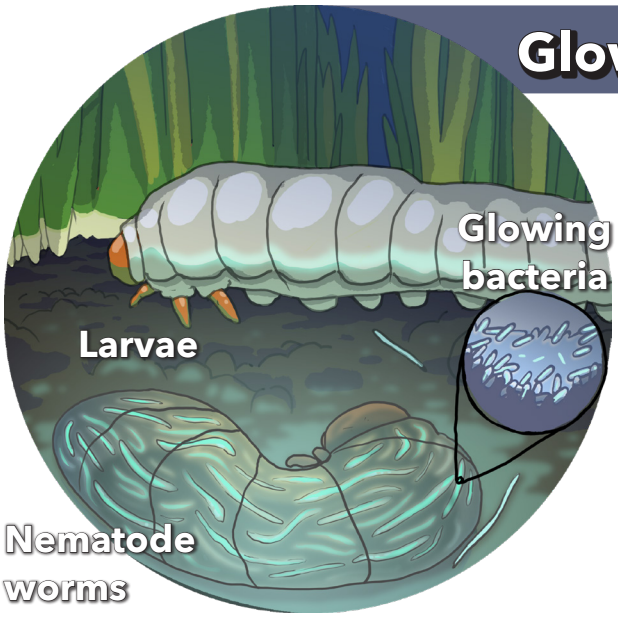
But it's all in service to the continued survival of a plasmid that the bacteria carry. The plasmid is just a loop of genetic material – it isn't even alive. The bacteria don't need the plasmid, or the plant, to survive.

Yet genes from the plasmid orchestrate the whole three-way relationship. Plasmid genes make the plant grow a gall to house and feed the bacteria. And plasmid genes enable the bacteria to use food from the plant!

Stop watching at 3:20
https://www.youtube.com/watch?v=l0_Qf86U8C4

Glowing Nematodes

ECO-TRIO



Nematode worms sit in the soil, waiting. When an insect larva comes by, a worm jumps up and burrows into it.

The worm has symbiotic bacteria in its gut, which it releases inside the host. The bacteria kill the larva and start dissolving its insides. The soupy larva guts feed the bacteria, the worms, and piles of their offspring.

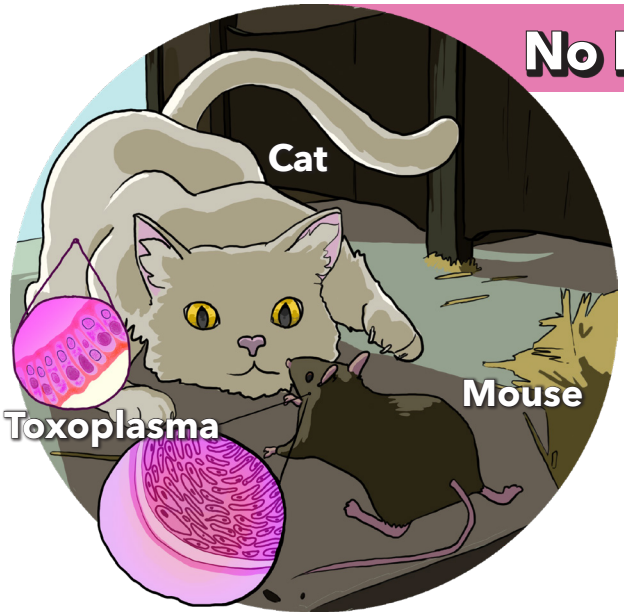
The bacteria make chemicals that keep other organisms away–like competing microbes and birds that could eat the whole colony. And they give the host an eerie glow, which may attract new insect hosts.

As the young worms eat, they take up some of the bacteria. When the food runs out, the worms dig down into the soil and wait.

Watch 6:00–6:59
learn.genetics.utah.edu/content/microbiome/symbiosis

No More Cat Aversion

ECO-TRIO



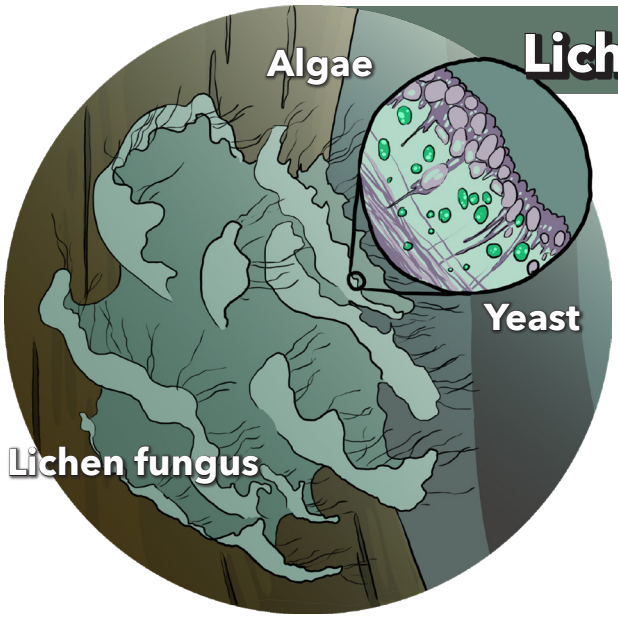
Mice hate cats…the smell of cat urine repels them. Unless they have been infected with a protist called Toxoplasma gondii.

When a mouse ingests these single-celled parasites from the ground or water, the parasites go to its brain and messes with its behavior. The aversion becomes an obsession!

Infected mice seek out the smell of cat pee, and that puts them right in the path of cats who will eat them.

The protist is now right where it needs to be: in the intestine of a cat, which is the only place it can complete its life cycle!

Stop watching at 2:30
youtube.com/watch?v=aA-POO8S01Y



Lichen

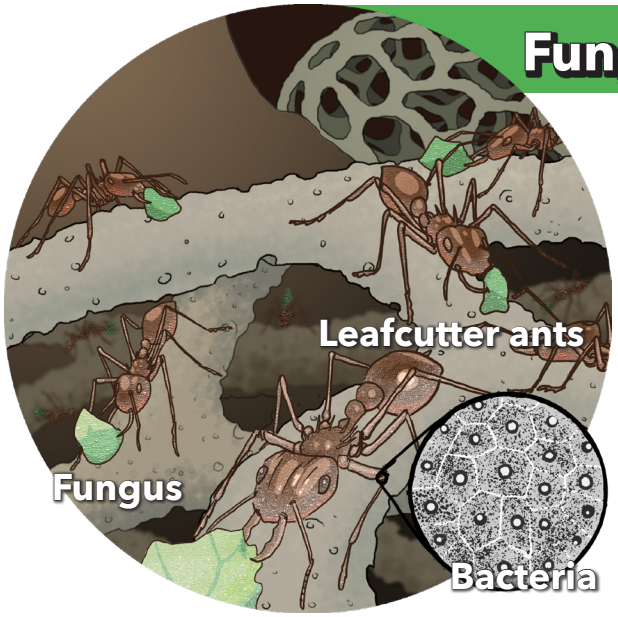
ECO-TRIO

Lichen is found all over the world in some of the harshest environments—places where individual members of this trio may not be able to survive on their own.

The algae uses photosynthesis to make food for everyone. The lichen fungus provides a protected, water-absorbant home, securely attached to a rock or tree.

Many lichens also have a third partner, usually a yeast (another type of fungus). Scientists sure yet what role the yeast play—but at least some of them make toxic chemicals that protect the lichen from predation.

youtube.com/watch?v=Fkw_VF5zDT0



Fungal Gardens

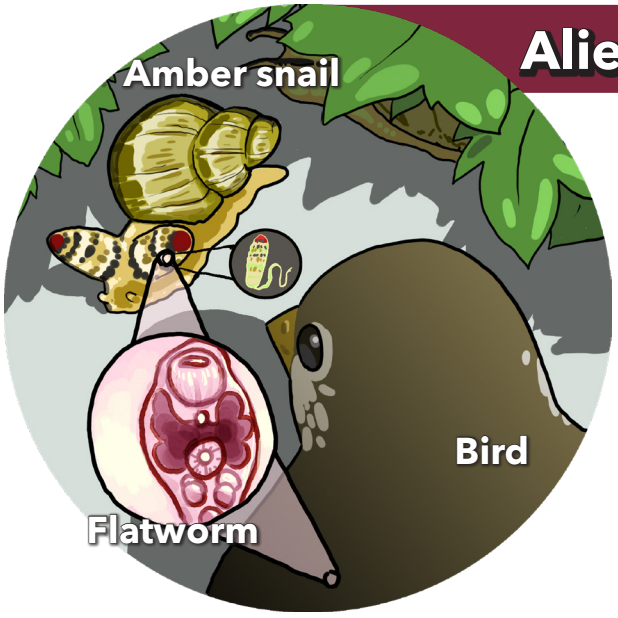
ECO-TRIO

Leafcutter ants march in long lines, carrying leaves back to their home. But the ants don't eat the leaves. Instead, they use them to grow fungal gardens, which they cultivate and then eat.

The ants' bodies, and their gardens, are covered in a white film of bacteria (Pseudonocardia). The bacteria make chemicals that kill other microorganisms that could invade the garden. And the bacteria may also protect the ants from being infected by parasitic fungi.

In return for this service, the bacteria may get nutrients and/or a free ride to new territory to colonize.

Watch 4:07–5:10
learn.genetics.utah.edu/content/microbiome/symbiosis



Alien Antennae

ECO-TRIO

Snails normally do whatever they can to hide from birds—who seek out the soft bodied animals for lunch. But when the snails are infected with a flatworm (Leucochloridium), their eye stalks transform into pulsating, colorful beacons that look like wiggling caterpillars. Inside are brood sacs, filled with dozens of flatworm larvae.

If that wasn't enough to blow the snail's cover, the flatworm changes the snail's behavior. Infected snails go out into the open where birds are most likely to see and eat them.

Once eaten, the young flatworms grow up in the bird's gut and make eggs that go out in the bird's poop. When a new snail stops by for a little treat, it unknowingly takes in a flatworm, and the cycle continues.

youtube.com/watch?v=Go_LIz7kTok