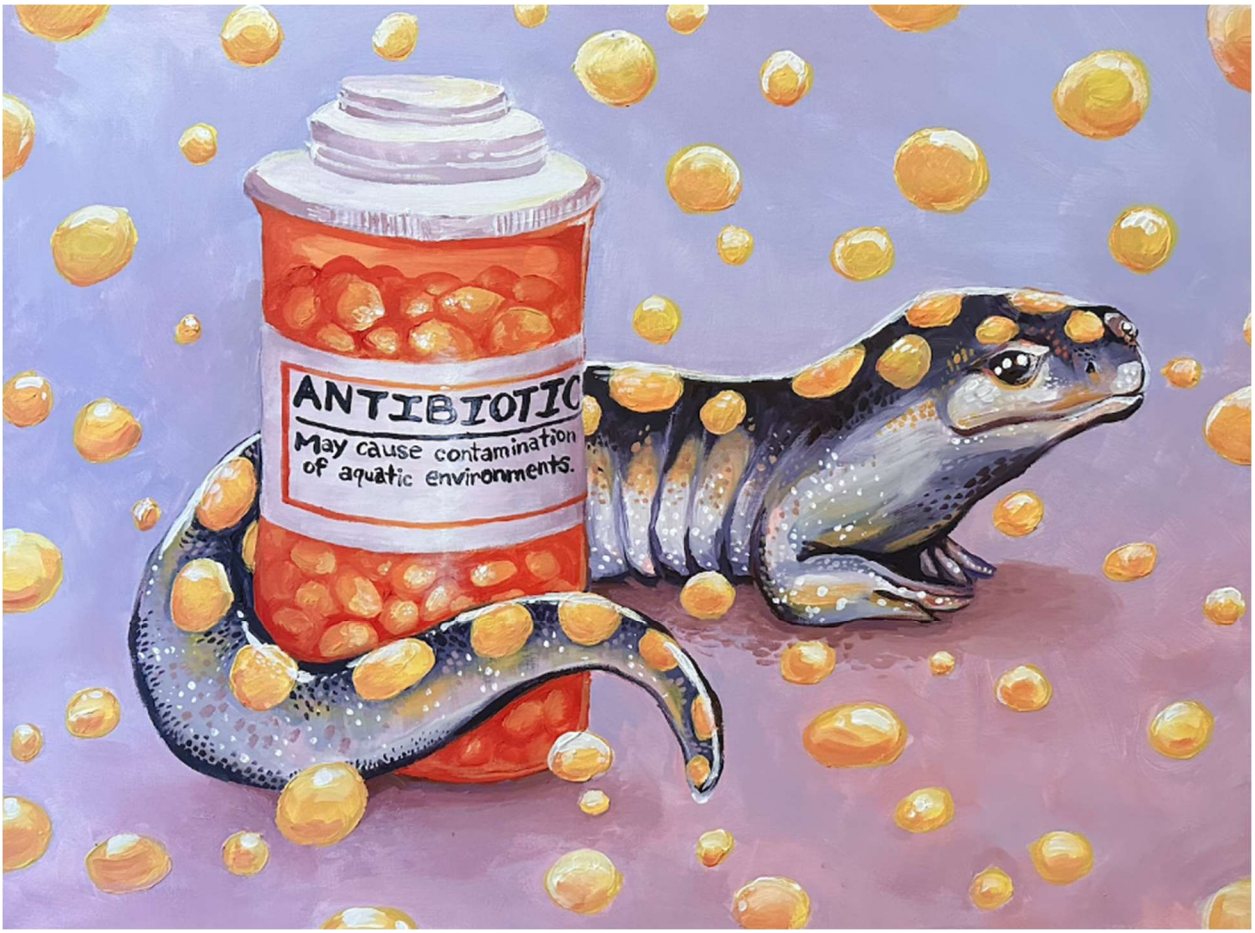
Section I: Pollutants

What pollutants are found in the wetlands? How do they affect organisms in our local environment, specifically amphibians and aquatic organisms?



Amphibiotics

Kathleen Lu

Section I: Pollutants

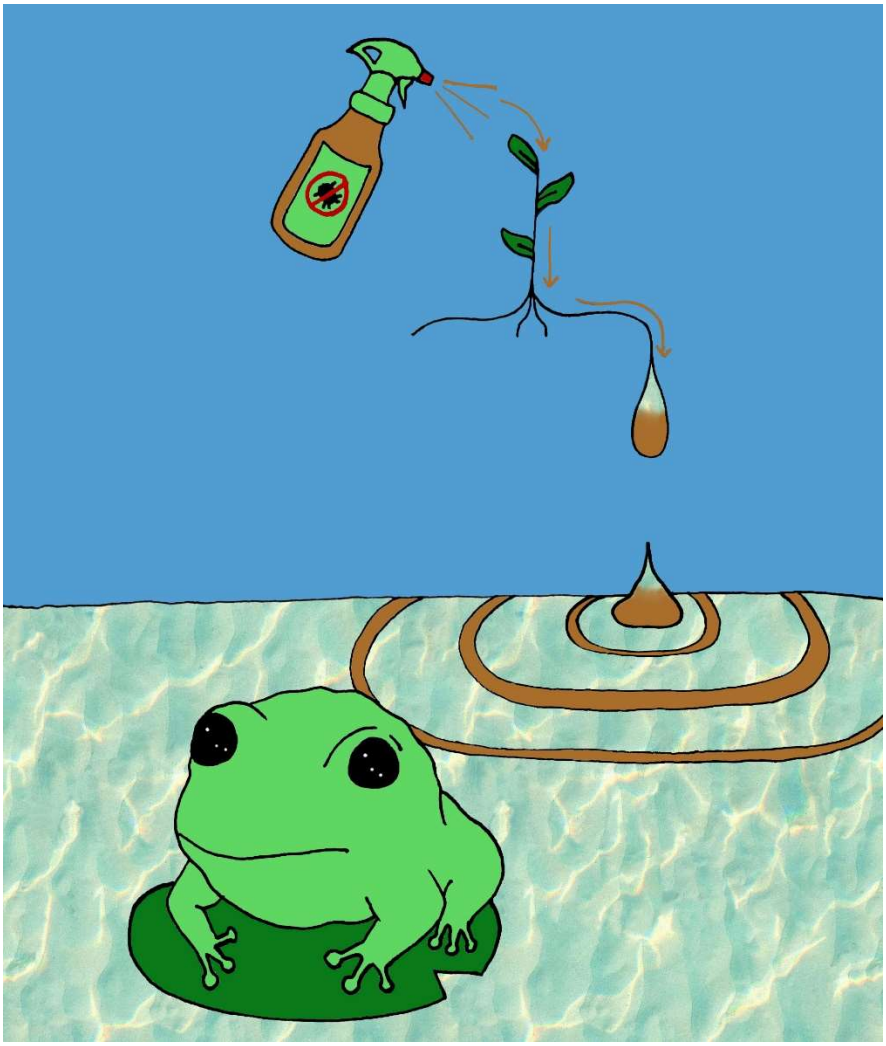
Amphibians tend to have sensitive skin, so when discarded antibiotics find their way into aquatic environments, they can be absorbed into amphibian skin and affect their fitness and relationships with other creatures. This painting features a spotted salamander, which is commonly found around vernal pools and forests.

Light Pollution

Angela Luo

Section I: Pollutants

Artificial light can have devastating effects on amphibians such as frogs as it disrupts their natural 24h rhythms and negatively affects their behavior and development. Through this piece, I hope to display the excessive illuminations of light from indoor lighting and outdoor lighting. Some simple ways we can reduce light pollution are by turning off lights when they are not in use and keeping blinds and drapes closed at night.



Pesticides

Lila Pomerantz

Section I: Pollutants

Pesticides seep through the soil and enter the runoff, which carries their toxic chemicals to streams and other aquatic ecosystems where they are absorbed by delicate amphibian skin. To portray this process, I created a design on photoshop, with a focus on the use of color to portray a message. I chose to color the runoff as an orange-brown tone, and a bright blue pattern for the water. I wanted there to be a strong contrast between these two colors to drive in the unnatural properties of pesticides.

Carbaryl Pollution

Ingrid Shen

Section I: Pollutants

Wood frog populations with more exposure to the pesticide Carbaryl are modestly more susceptible to trematode (a parasite) infections. Trematode cysts cause massive disruption and abnormal cellular growth involving the limb buds of infected individuals, causing deformities in the frogs' limbs.

Pollution is Threatening the Survival of Frogs and Their Habitats

Nagasri Thota

Section I: Pollutants

As pollution continues to wreak havoc on our planet, the survival of frogs and their habitats are at risk. Let's take action to reduce pollution and protect these important species before it's too late.

Section II: Biological Interactions

How do organisms interact with one another in the environment? What benefits and stressors do these interactions create for the organism and the ecosystem? How do pollutants and other stressors influence these interactions?

Tadpole Competition

Ingrid Shen

Section II: Biological Interactions

Competition is an interaction between organisms or species in which both require a resource that is in limited supply. Competition in tadpoles can cause them to become shorter and lighter or to experience faster metamorphosis, allowing them to move onto land for other resources. Some tadpoles may also induce carnivory in the presence of competition.

Fight or Flight

Angela Luo

Section II: Biological Interactions

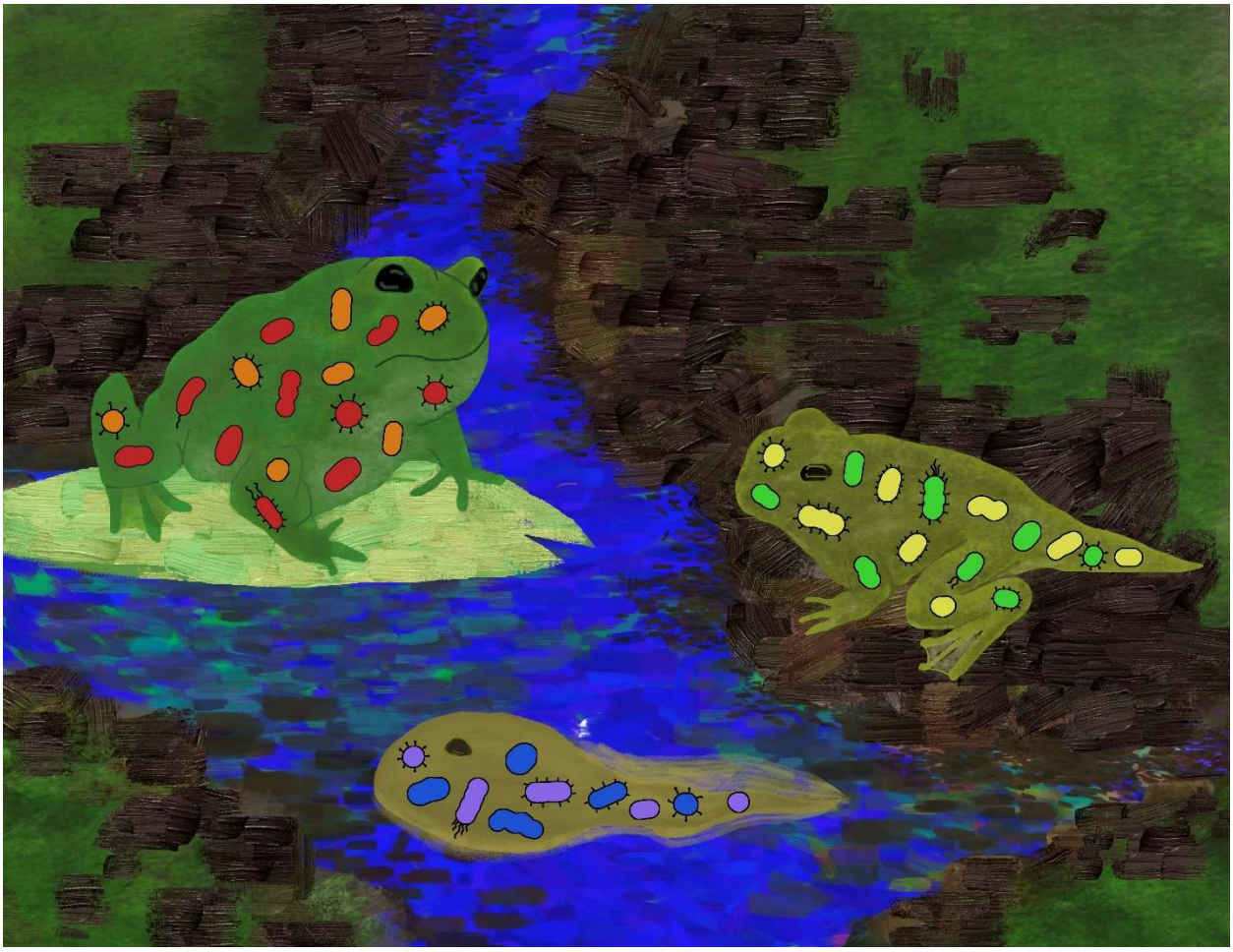
Caption: This piece shows the predator-prey interactions between the predatory eastern newt and gray treefrog tadpoles. When people are exposed to threatening situations, stress hormones are produced to get our bodies ready to either defend themselves or escape. Like humans, when these tadpoles sense the predatory eastern newt, they produce stress hormones that actually allow them to grow larger bright red color tails as a fight or flight response to have a greater chance of surviving a predatory attack.

The Life Cycle of a Trematode Parasite

Olivia Cashimere

Section II: Biological Interactions

Trematode parasites start their life cycle by infecting aquatic snails. Snails then shed the parasite into the water where tadpoles live. In this painting, the tadpole within the water is thrashing around as it gets attacked by the trematode parasite. In the background a Great Blue Heron is feasting on tadpoles from the pond. Eventually the Great Blue Heron feeds upon a tadpole infected with the parasite. The parasite then infects its desired host, the Great Blue Heron.



Host-Microbiota Interactions

Lila Pomerantz

Section II: Biological Interactions

The microbiota living on the skin of amphibians, specifically different frog species, differs in regard to a variety of factors. These include life stages, environment, climate, and sex of the frog. This design portrays the differences in life stages; a tadpole, a froglet, and an adult frog. Done in a program called Krita, differing microbiota is drawn directly onto the skin of the frogs in each life stage with its own set of colors.

Attack on Fungus

Kathleen Lu

Section II: Biological Interactions

Tadpoles actually produce a biofilm of bacteria on their skin that release antifungal compounds. In this painting, the antifungals are fighting off the invading fungal disease *Bd*. (*Red=bacteria, Yellow=antifungal secretions, Green=Bd*).

Disease Transmission in Tadpoles: How Healthy Individuals Can be Affected by Infected Peers

Nagasri Thota

Section II: Biological Interactions

Disease transmission can occur even in the earliest stages of life, as healthy tadpoles can contact infected peers and become sick. Understanding how diseases are transmitted among tadpoles can help us better protect amphibian populations from devastating outbreaks.

Section III: Techniques

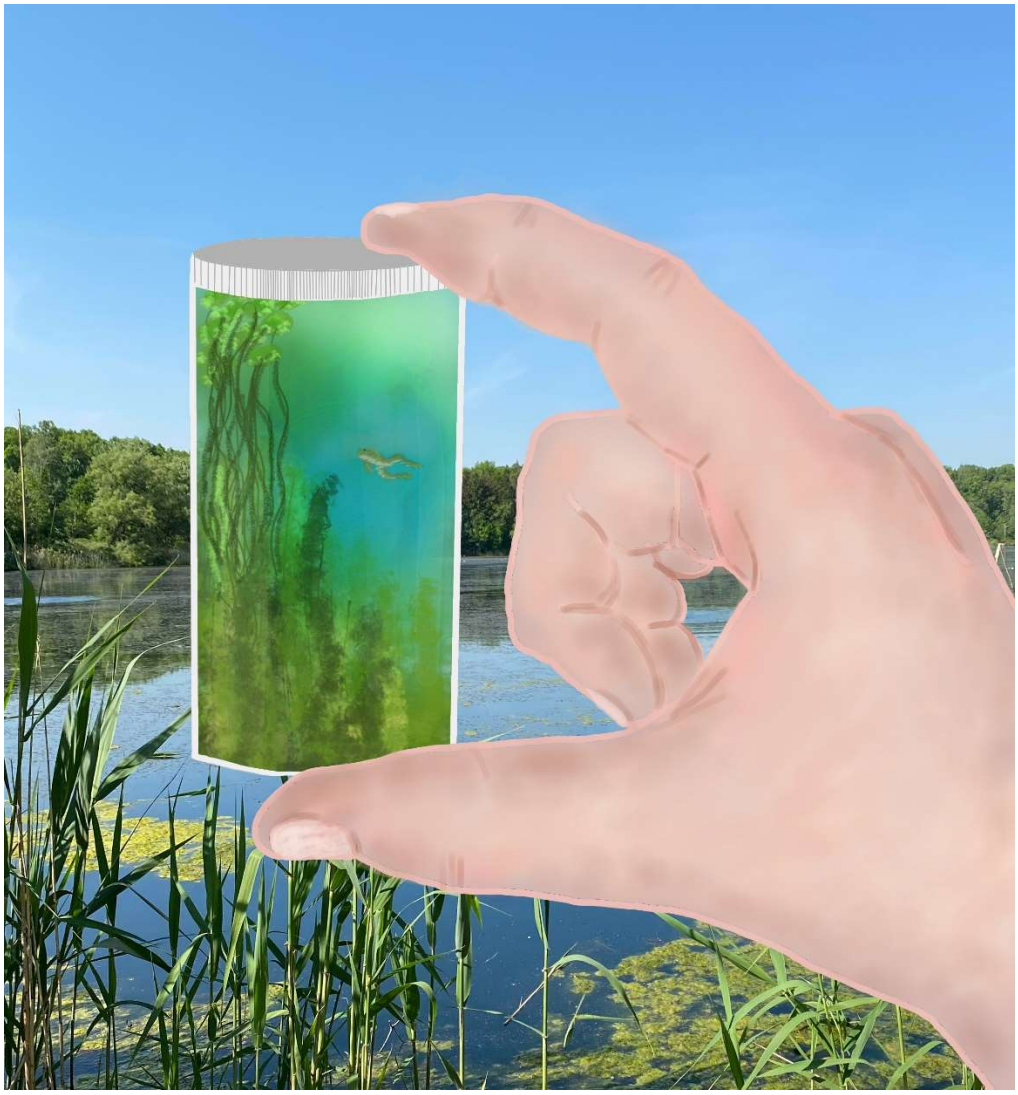
How do researchers study these pollutants and biological interactions in the field and in the lab?

Dipnetting is Like a Box of Chocolates

Kathleen Lu

Section III: Techniques

You never know what you're gonna get! This is how researchers catch tadpoles, newts, etc. Just go into a muddy, marshy area and "dip" the net a few times. It's pretty fun!

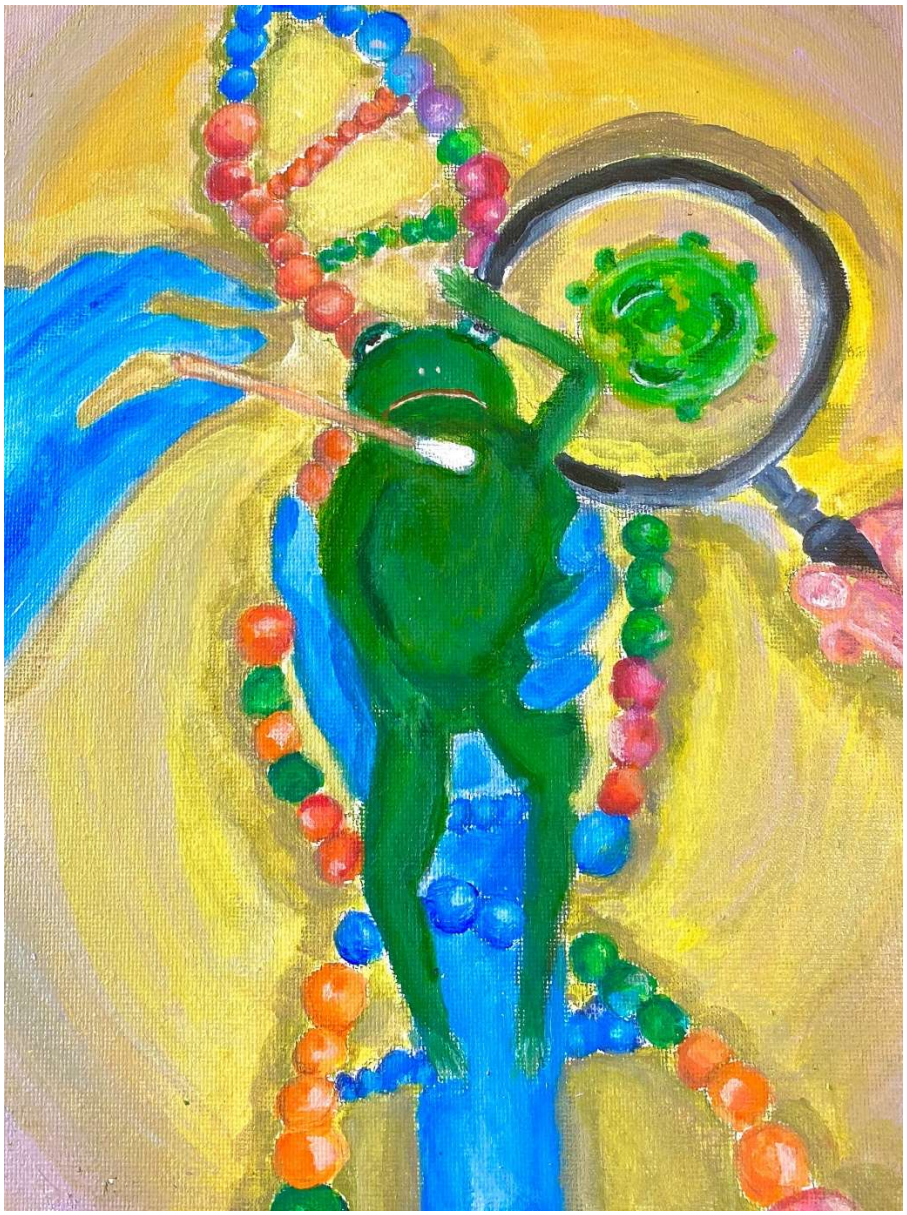


eDNA

Lila Pomerantz

Section III: Techniques

eDNA stands for “environmental DNA”, and it involves using genetic material obtained from environmental samples which can be used to quantify the amount of different pathogens and organisms present in an area. This information led me to the idea of someone holding a sample, with a pond habitat inside the container, to show where the different pathogens may be found in the environment. This design was also drawn in Krita, with the background image taken by a friend visiting a park on Long Island.

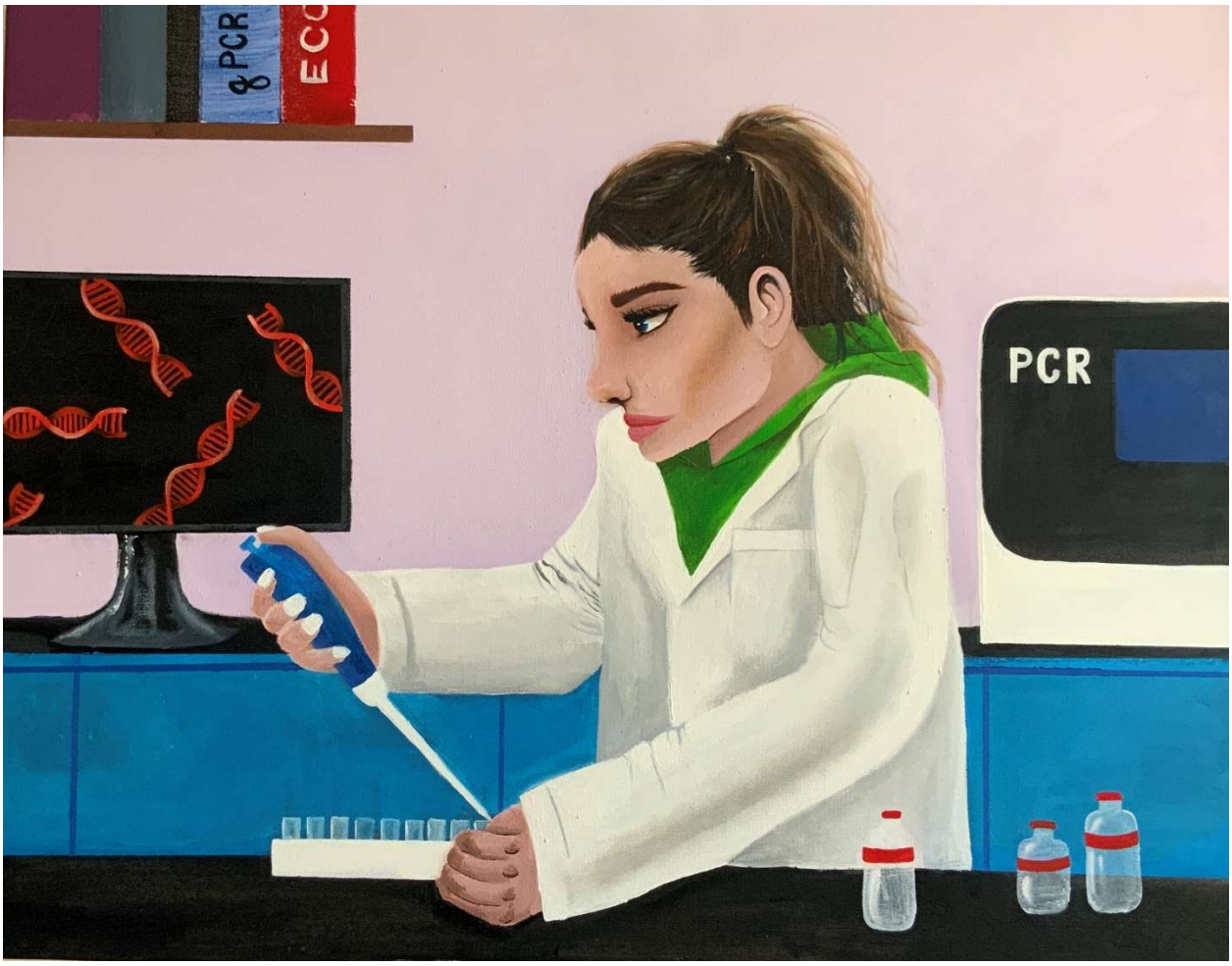


Swabbing

Angela Luo

Section III: Techniques

There is a hand holding the frog with another using a q tip to swab. The magnifying glass shows chytrid fungi to show how the frog has been tested with *Chytridiomycosis* as an infectious disease. This disease is a significant problem causing the decline in the frog population that can be tested through the swabbing technique.

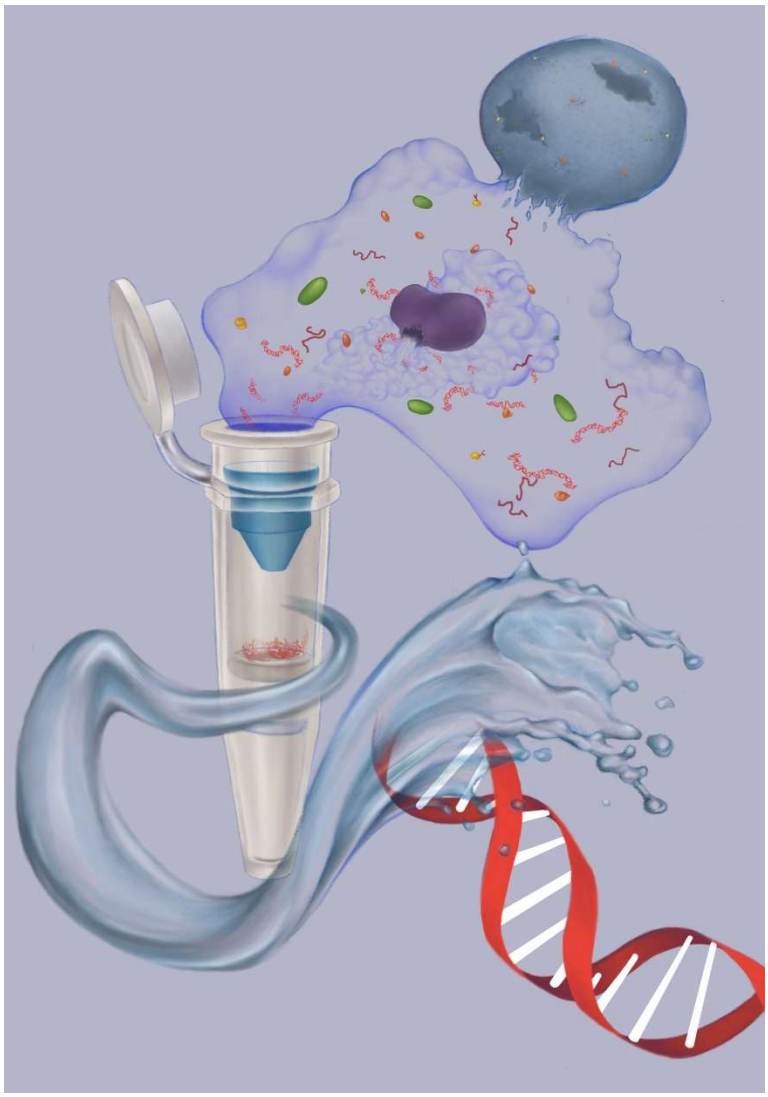


Student Begins PCR Process on Tadpole DNA

Olivia Cashimere

Section III: Techniques

A student is undergoing the process of extracting some tadpole DNA to place it within the PCR machine for DNA analysis. These tests are helpful for studies on infection, disease transmission, species identification, and many other helpful studies.

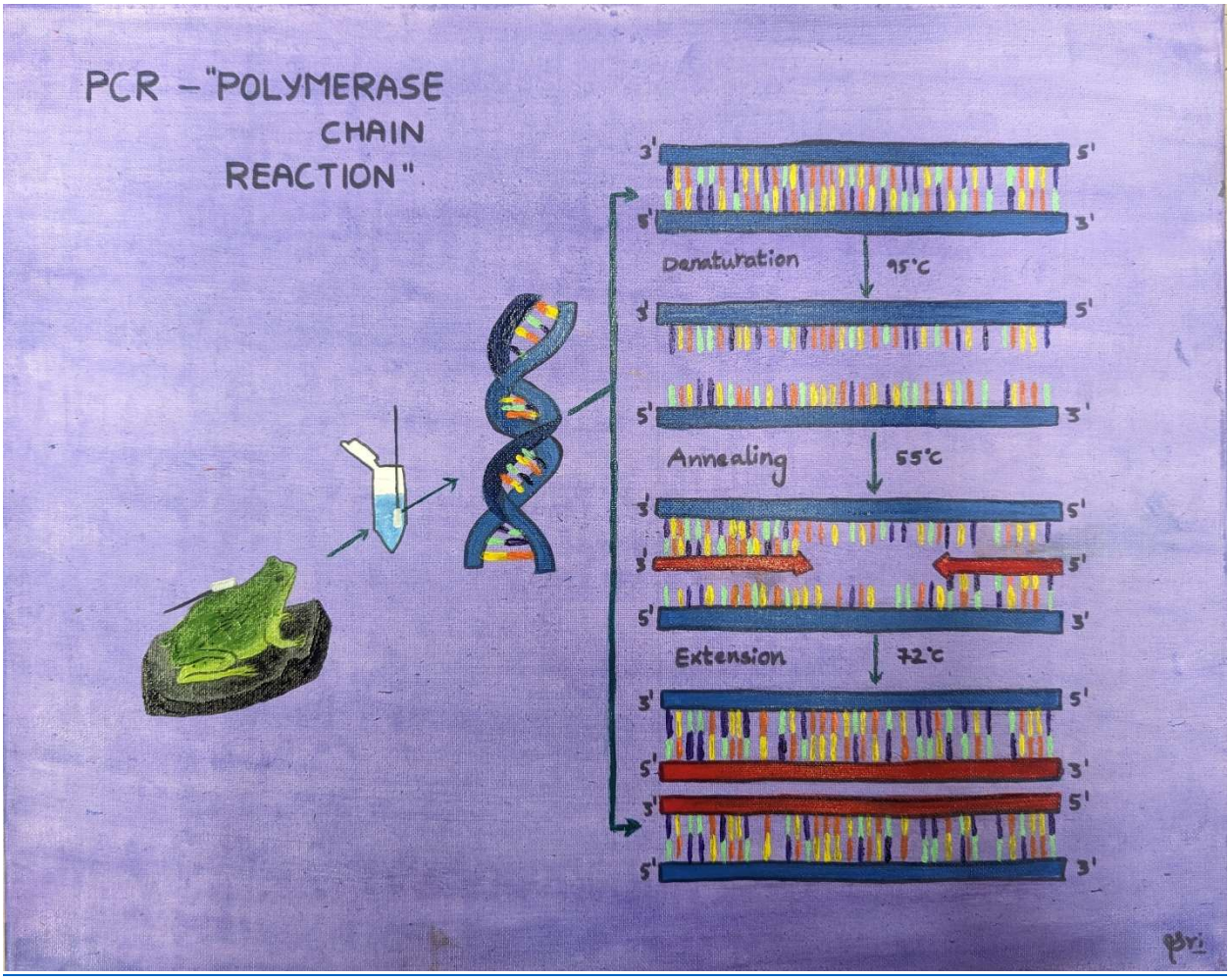


DNA Extraction

Ingrid Shen

Section III: Techniques

To analyze DNA, it must first be extracted from a sample. The first step of DNA extraction is “lysis”: using a soap and an enzyme to break up cell walls and membranes and make it so everything (DNA, protein, lipid) is floating together in the solution. In this drawing, the DNA is separated using a small filter to separate it from everything else (like proteins) in the sample. Once the DNA is separated, it is washed and “eluted” into its own, pure aqueous (in water) sample. Now, it's ready for analysis (like PCR)!



PCR-Based Detection of Disease in Frogs and Tadpoles: An Essential Tool for Conservation and Management

Nagasri Thota

Section III: Techniques

PCR technology has revolutionized disease detection in frogs and tadpoles, helping to protect vulnerable species from outbreaks and decline.