

Sovereign Autonomy for Long-term Monitoring of Non-human genes (SALMONg): the use of eDNA by community and citizen scientists in the Arctic

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Community & Citizen Science in the Far North 2024 Conference

April 17, 2024 (11:0-11:15 AKST)





Outline

1. Background: eDNA, PCR
2. Motivation: genetics for the next generation of Indigenous data scientists
3. Approach: Meet the team
4. Approach: SALMONg
5. Results
6. Future work: GRI summer 2024

What is eDNA?



eDNA, or environmental DNA, is all the genetic material that is found in an environmental sample.



eDNA can consist of whole organisms (phytoplankton), intact DNA within cells, free-floating DNA, or DNA fragments

How can eDNA be used?

Where can eDNA be collected from?



air



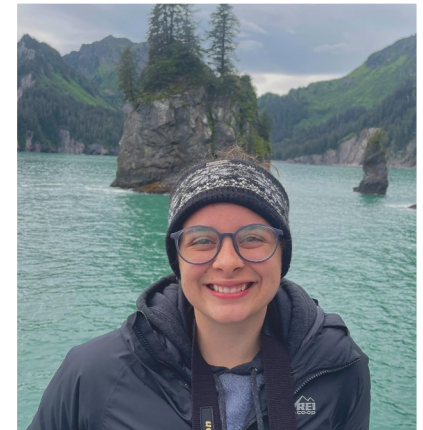
soil



water

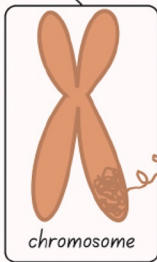
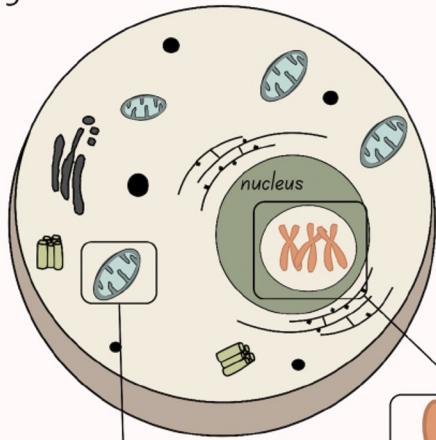


snow/ice



Maris Goodwin

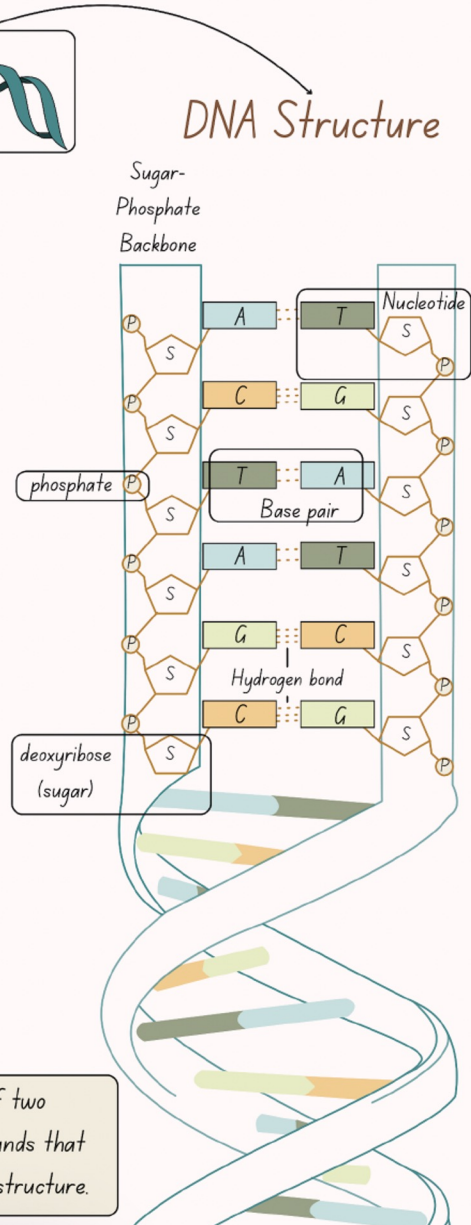
Eukaryotic Animal Cell



DNA, or deoxyribonucleic acid, is the blueprint of life found in the cells of living organisms. DNA contains a unique sequence of base pairs that defines each individual.

DNA is found in two places. The mitochondria and the nucleus.

DNA Structure

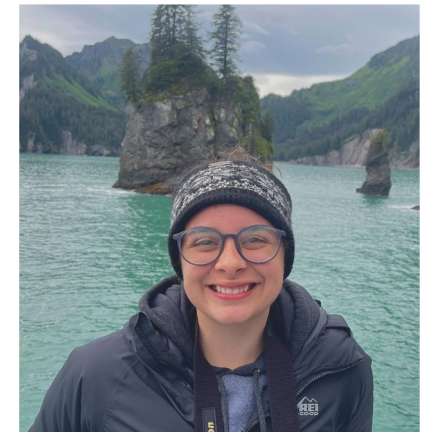


Guanine (G) Cytosine (C)

Nucleotide bases

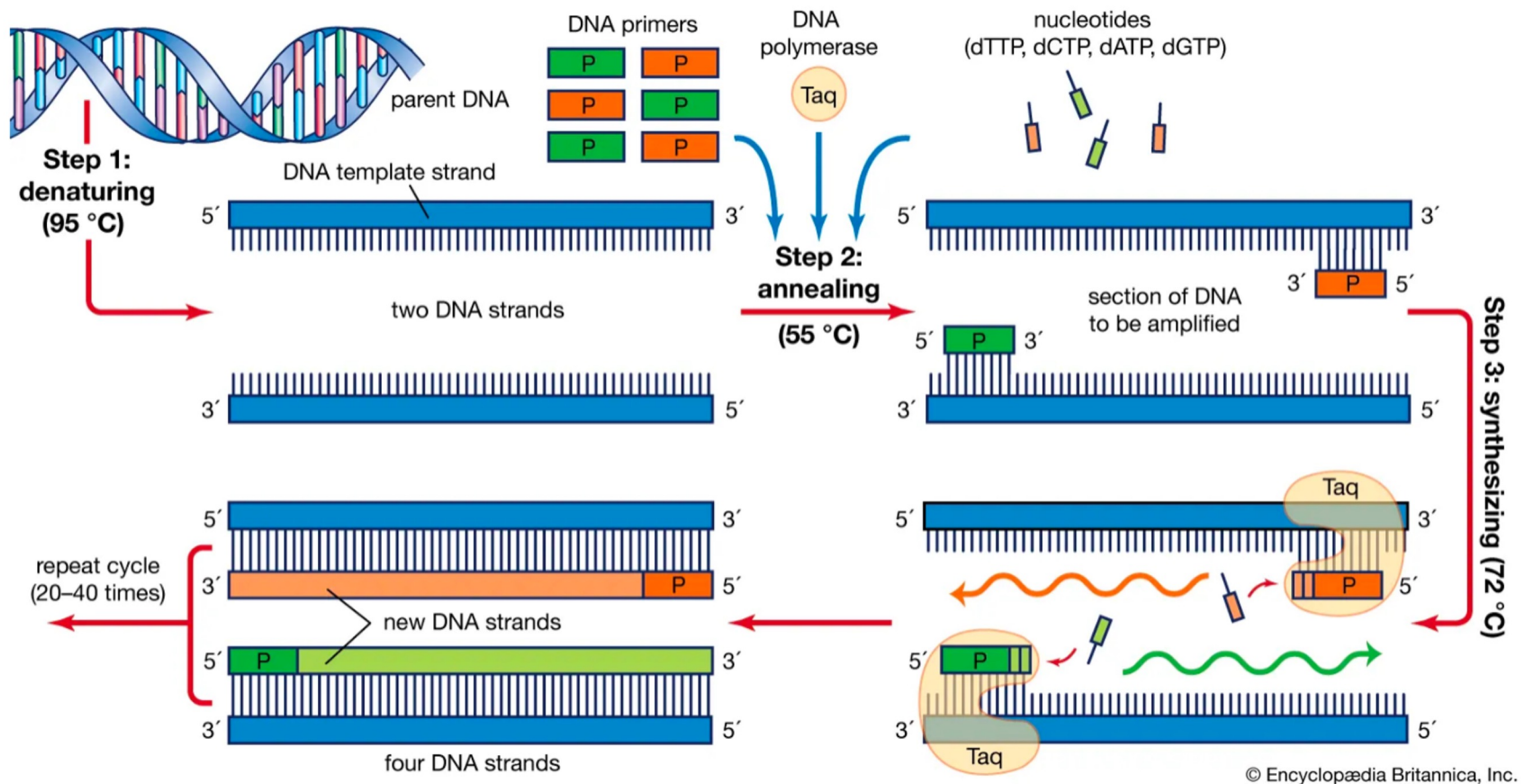
Adenine (A) Thymine (T)

DNA consists of two complementary strands that form a double helix structure.

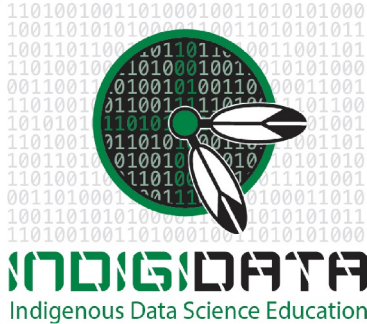


Maris Goodwin

Polymerase chain reaction



Motivation- Long-term goals



Dr. Jessica Glass



Approach- Team of eDNA trackers



Dr. Erik Schoen



Maggie Harings



Rachel Lekanoff



Julian Pender



Maris Goodwin



Kristen Reece



Dr. Andrés López



Dr. Jessica Glass

Approach- Hands-on research



Creates a classroom experience that is connected to a real place that students have deep connection to.



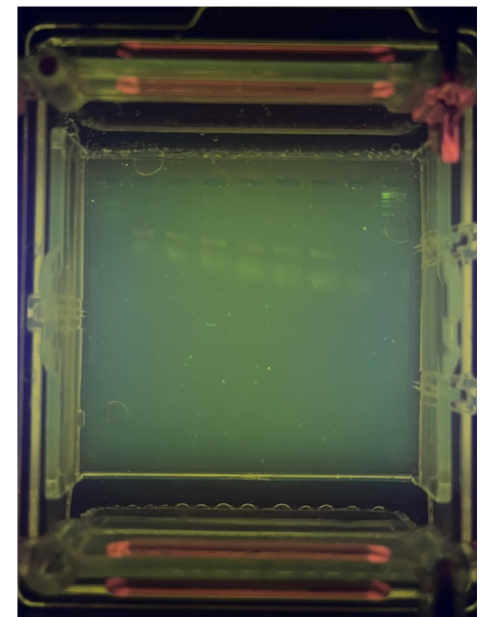
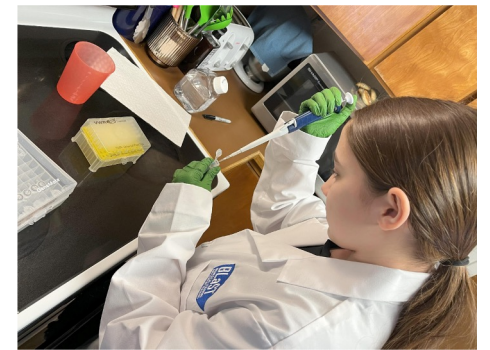
Amy Irons, Teaching and Research at Northwest Indian College from a Student Perspective
Salish Sea Ecosystem Conference (2016 : Vancouver, B.C.)

Approach-Teachable PCR methods

- Utilize eDNA as a long-term monitoring tool
- Early detection system
- Sovereignty and Autonomy for Long-term Monitoring of Non-human genes (SALMONg)



Results- For the next generation



Future work- Outreach summer 2024

“Education is a natural process carried out by the child and is not acquired by listening to words but by experiences in the environment.” Maria Montessori



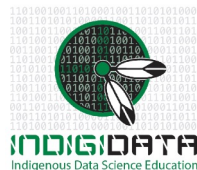
Kristen Reece



Maris Goodwin



Erich Kuball
Dan Gillikan



Ahéhee'! (thank you)

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