

Clip #1 Transcript: Intro to Dr. Singh & About CoAdapTree

My name is Dr. Pooja Singh, I am a Post-doctoral associate in Sam Yeaman's lab at the University of Calgary; I'm a **computational biologist**. I was really interested in **evolutionary biology**, as opposed to just **tree biotechnology**, which is what my Master's was on. And then I moved to Sam's lab to understand a bit more about the techniques that we use to identify the genetic basis of **adaptation to changing climates**, and trees [are a great]—well conifers especially and trees in general—are a great model to do those because when the climates are changing, the trees can't move, it's not like a fish that can swim away; the trees have to stay there and learn how to deal with this.

When I have my own lab I want to be working on the impact of climate change on the **biodiversity** that we have on our planet, I don't want to just limit myself to conifers, but I think at this point it's a good place to start to understand the genetic methods that we can use to study adaptation to climate change. My Bachelors was in Molecular Biology because I wanted to understand how does the DNA that an organism has **translate** into coding what the organism looks like or how the organism behaves.

At the beginning, I was very much a lab work person, I did a lot of **DNA extractions** and **RNA extractions** and working with small regions of the DNA of an organism, so a gene. And then when I progressed to my Master's degree, I wanted to be able to study all of the genes in an organism, so that can vary anywhere from a few thousand to thirty to forty thousand or more. And to be able to do this, I needed to break into computational biology because essentially what your **DNA sequence** is, is a string of **A/T/G/C nucleotides**. [So] I decided to move to computational biology. I started learning how to **code** myself and now most of my day is sitting in front of a computer screen analyzing those A/T/G/Cs across species or across **populations** of a species [and] across variable environments to try to understand if there is a difference between the populations of the species and if these differences could be playing a role in why those species are different; or how those species might be responding differently to the environment and especially to the environment as it changes as a result of **climate change**.

Aside from doing computational research, I also interact with the graduate students in the laboratory and we have discussions about things and techniques or research that they're struggling with. And that's pretty much my day normally!

CO-ADAPT-TREE. 'Co' is for **conifers**, 'adapt' is for **adaptation** and 'tree' is for conifers that are adapting. The 'co' can also stand for **convergence** because that's of particular interest in terms of the biology of these species. CoAdapTree is a project where we are trying to understand how these conifers that are ecologically and economically so important for Canada, if we can somehow understand the genetic basis of how they deal with changing environments. So if we can understand the genetic basis of this, maybe we will be able to predict whether they will survive or not in the future, because their survival is very important for industry as well as the people of Canada and the ecosystem of Canada. As I am a geneticist, my main goal is to look at the DNA sequences and to see if we can identify patterns that could be turned into tools—**selection or breeding tools**—to keep our conifers in Canada healthy and happy for the future generations.

