

Clip #1 Transcript: About Dr. Lu's Work & Research

My name is Mengmeng Lu. I'm a post-doc scholar at the University of Calgary in Dr. Sam Yeaman's lab. I work on **conifer** genomics.

Currently, I focus on analyzing lodgepole pine tree **nucleotide sequence data** to find out **candidate genes** that respond to Dothistroma needle blight disease. This is a major **fungal pathogen** caused disease that endangers the growth and yield of lodgepole pine in British Columbia and Alberta. We try to find the **genes** and **alleles** that confer **resistance** to lodgepole pine. Once you find out these resistant genes and alleles, we can use them as **molecular markers** to distinguish genotypes. We want to plant trees with the best resistance potential when facing disease to maintain yield.

From a research perspective, we also want to find out the **gene pathways** that help trees to respond to disease. We hope to find out a useful and durable resistance mechanism for these trees. Another subject in my work is to find out resistance to climate stresses like heat, cold, and drought stresses.

Besides lodgepole pine, we also look at other conifer species like Douglas-fir, western larch, and jack pine. We hope to develop better reforestation options to help tree breeders to select and plant healthy trees in future climates in western Canada.

I'm working on **bioinformatics**; that means I work in front of a computer and connect to servers to analyze DNA and RNA sequence data. I use various software to model the gene patterns and find out candidate genes. This is one of the magic things about genomics research: sometimes I feel like I'm travelling through time because we can model the change in population size in the past millions of years using the current DNA data.

I don't think working with data is boring. Every day, I feel like I have a great deal to learn. I think my work is rather interesting. Of course, my research is not easy. We deal with tons of data. This task is similar like trying to find a needle in a haystack.

But I am confident in my studies because I don't work alone. Instead we have many talented people in our team. We have many collaborators to complete this work along with me; some of them work in the field to collect tree samples, some work in the lab to extract DNA and RNA, some work in the greenhouse to perform phenotyping experiments. We work as a team! I really enjoy my work, it is my passion.

