

## “In Indigenous Genes, Evidence of Colonization’s Plagues” Excerpt Transcript

*Excerpt from [November 25, 2016](#) episode of Science Friday.*

**IRA FLATOW:** This is "Science Friday." I'm Ira Flatow.

New research published in "Nature Communications" assesses the impact of European colonization on the genes of one indigenous group of British Columbia, finding in their DNA evidence of devastation from disease-- smallpox included-- in the 19th century. The researchers compared samples from ancient remains of people in the Prince Rupert Island area to living members of the Tsimshian first nation. And they found changes in their immune systems and evidence of a huge loss of life about 200 years ago.

The lead author on that research is Dr. Ripan Malhi. He's a genetic anthropologist and Associate Professor at the University of Illinois at Urbana-Champaign. He joins us from Tampa, Florida.

Also with us is Barbara Petzelt. She is Treaty Coordinator at the Metlakatla Treaty Office. She's an archaeologist, and part of the research team. And she joins us from Metlakatla in British Columbia, Canada.

Welcome to "Science Friday."

**DR. RIPAN MALHI:** Hi, great to be here.

**BARBARA PETZELT:** Thanks for having me.

**FLATOW:** The Metlakatla are a First Nation within the Tsimshian? Is that correct, Barbara?

**BARBARA PETZELT:** Yes. They're one of seven of the Tsimshian First Nations.

**FLATOW:** And, Dr. Malhi, how different were the genes you looked at between the ancient and the modern groups of Tsimshians?

**MALHI:** Well, for the whole genome, or the genome-wide scan that we did, the ancient individuals and the living individuals were very similar. So much so that we could suspect that they're a continuous population.

But for specific genomic regions, we found signals of natural selection in the ancient individuals, specifically at genes related to immunity. And so this suggested that the ancient individuals were actually adapted to any pathogens in their ancient environments.

**FLATOW:** And how did they lose that immunity, then?

**MALHI:** Well, it seemed that after European contact, that other pathogens were brought over from Europe. And one possibility is that these ancient genetic variants that were well-adapted to ancient pathogens were no longer adapted to the current pathogens that Europeans brought over. And so these genetic variants changed dramatically as a result of that in the living community members.

**FLATOW:** Barbara, how much of this research is new information to you?

**PETZELT:** Well, considering a lot of this information was passed down in our oral histories and through the archaeological record, not much of it is actually surprising. The interesting part is that it's actually shown in our genetics.

**FLATOW:** Dr. Malhi, how do you think the Tsimshian can use this data? Does anything also excite you about these findings?

**MALHI:** This is-- at least in the Americas-- the first time that we've been able to show through a study of genetics of a continuous population before and after European contact what the effects of European colonization was.

The other part of this that I think is really interesting is the partnership that we have with the Metlakatla and the co-Tsimshian. So it was a study where we both decided what we wanted to study and how we wanted to study it.

**FLATOW:** So are you saying this is a unique partnership that hasn't happened before?

**DR. RIPAN MALHI:** What's happened a lot in the past is that researchers would go into a community, get the samples that they needed, and then they would leave, rarely coming back to report any results. And so we didn't want to follow that model, and so what we did is met with communities, decided what would be a mutually beneficial study, and then we would come back year after year to report on our results and discuss the results with community members.

**FLATOW:** Barbara, so you and the community welcomed this then?

**PETZELT:** Like Ripan said, there were things that we wanted to get out of this as well. You know, like proving the genetic link between Metlakatla modern descendants and the ancient ancestors from sites within the territory. It makes us feel that we're not just subjects of research, and that we are actually a part of it and helping to drive it.

**FLATOW:** Were you ever fearful that once the scientists came in and were doing genetic research about the history of your nation that they might reveal histories or other aspects of your community that you did not ask them to go look at?

**PETZELT:** It's pretty well-known to the members that this is their territory. And we didn't expect the results to be any different, and they weren't. They actually corroborated what we've been-- what the community's been saying all along.

We were more concerned about the relationship, because there's nothing more personal than your DNA. And we had spent quite a bit of time with Ripan talking about the proposed research, looking at various informed consents from different organizations and from the University of Illinois, and looking at the ethics of using genetics for research.

**FLATOW:** That's great. I want to thank you both for taking time to be with us today.

**MALHI:** Great, thank you.

**FLATOW:** You're welcome.

**PETZELT:** Thanks.

**FLATOW:** Dr. Ripan Malhi is Associate Professor of Anthropology, University of Illinois in Urbana-Champaign. Barbara Petzelt is Treaty Coordinator at the Metlakatla Treaty Office.