Transcript of 2021 3MT® presentation by Anita Luu, PhD Biomedical Sciences candidate at the University of Guelph

Okay, I know this sounds a little weird because we just met, but if I were to send you a text right now that said, "made this cookie recipe last night, it was amazing, you have to try it!". What would you assume about me? Well, one, I probably like cookies, and two, I probably like to bake, both of which are true by the way. Now what if I told you cancer cells have a similar way of communicating, and we could more or less get the same information.

Hi, my name is Anita and I'm a PhD candidate in the Department of Biomedical Sciences. I study bone cancer in dogs, the same type of cancer that Terry Fox had. The treatment of bone cancer has stayed the same for the last 30 years, and my research hopes to change this. I'm doing this by listening in on what cancer cells are saying, to try to understand them a little bit better.

You see, cancer cells are able to talk to one another by releasing tiny little bubbles. Okay, they might not be as sophisticated as the latest iPhone, but these bubbles are jam packed with all sorts of stuff. They contain genetic information like DNA, and proteins, which can help change the behaviour of cells. Now these little bubbles can tell us something about cancer cells, that's because the contents of the bubbles reflect the cell that it from, kind of like how a message tells you something about the sender.

In my research, I took normal and cancerous bone samples from dogs with bone cancer. I took these samples back to the lab, smush them up, and collected all the bubbles that they released. To see what proteins were inside of these bubbles, I burst them open and sent them for analysis. Throughout the course of my PhD, I collected bubbles from several different patients, and I saw a really interesting pattern. I found a group of proteins present in high amounts, but only in the bone cancer samples, and not the normal.

So, what does this all even mean? It could mean that this set of proteins are really important for bone cancer cells to survive, grow, and maybe move to other areas of the body. To see if I was right, I picked one protein in particular and dug a little bit deeper.

In the lab, I exposed bone cancer cells to a drug that blocked this protein from doing its job. And what I found was this drug was able to kill cancer cells and prevent them from growing. So, kind of how you learnt something new about me, and my text about baking, I am learning the same things with bone cancer cells based off their messages.

By collecting and decoding these messages, my research can potentially find new treatments to help dogs with bone cancer live longer and healthier lives. Thank you.

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