Ágnes Bilecz

Visiting Pathology Scholar,
Ludwig Chicago

Tell us a bit about yourself.

I was born and raised in Hungary, and I also completed all my studies in Hungary. I was born in a small town called Balassagyarmat. It's my party trick to teach people how to pronounce it, which is close to impossible for non-Hungarians. It's near the northern border of Hungary, close to Slovakia. When I was growing up, it had like, 20,000 inhabitants, so it was very small. It has, I think, eight different schools because kids from the entire region come there to study for elementary school and then high school, so there are a lot of youth there.

My mom was a teacher and my father also moved to this town to be a teacher there. It was an important part of my upbringing, that they were educators. They were very involved with the community. Everyone knew them. They were the teachers for half the city. My dad was part of the local government while he was teaching philosophy in my town. Then he taught political sciences and world history in nearby colleges. And my mom was a musician. She played the cello and later became a music and Hungarian language teacher. So she always had these theater groups for kids as an after-school activity. She also started a video and film club for kids.

So studying and learning about things was always connected to my parents. They were always very curious, and I noticed it more and more in myself—that if you didn't know something, it wasn't a problem, ever. It was always 'oh, I haven't thought about this, let's learn about it. Let's go there.' I see this mindset in myself and my brother, who became a scientist. He studied particle physics. It's something I really don't understand but it's fascinating when he talks

about it. I think curiosity is a family value that we share.

Tell us about your training.

I studied medicine in Budapest, at Semmelweis University, and I also did my PhD there. I studied mesothelioma and prognostic and predictive factors in mesothelioma. I knew early on that I wanted to be involved in patient care, and pathology looked like a great opportunity. I completed my training in pathology in Budapest, did my residency there and then applied for a Fulbright scholarship, and was the most surprised that I got it. I was so happy I could come here. It was my mom's mindset: it looks hard, let's do it. And that's how I joined the pathology department at UChicago. First, to learn about gynecologic pathology because this is a huge center and this is what I developed an interest in during residency, especially ovarian cancer. It's often challenging from a diagnostic standpoint. It also has a lot of molecular implications that I have always been interested in. How can we figure out better treatment options based on the molecular characteristics of a tumor? And then I met Ernst Lengyel, who had just started an ovarian cancer transcriptomics and spatial proteomics project, which turned out to be a good fit for my molecular biology and pathology training.

How long have you been in Chicago?

This is my fourth year. It's a lovely city. I think it's lovely in the winter, actually. In Hungary, we don't really have snow anymore. And I'm always so happy when it snows, especially when there is a warning that I'm not supposed to go outside. I can tell my lashes are freezing, but I'm outside jumping around in the snow. You have to enjoy it. I also enjoy the proximity to the lake and the nature here as much as the people.

Tell us about your work? What about it fascinates you the most?

We work on gynecologic malignancies in the lab. The common denominator is improving patient outcomes, finding new therapeutic targets, repurposing drugs or finding new indications for drugs, early detection of cancers and prognostics. Everything is really about improving patient care.

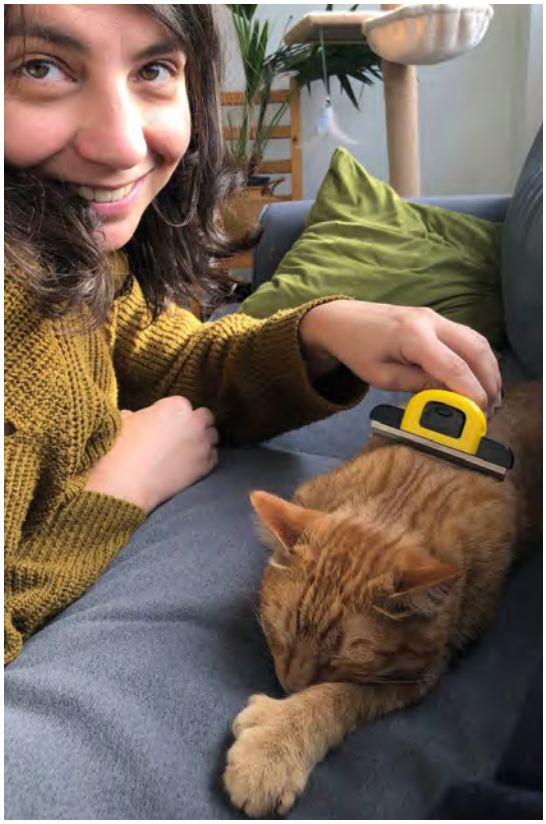
I work on one project that is about the metabolism of clear cell ovarian cancer,

which is a special subtype. Early-stage patients have a good prognosis, but once it spreads, it's very resistant to therapy. So we are trying to understand what metabolic pathways are important for the cancer cells, what the weak points are.

So that's one thing that I'm working on. And I learned a lot about metabolism in general, methods like mass spectrometry from the core facility here and also a lot of *in vitro* work that's relatively new to me. But I have all my amazing colleagues who I can talk to. Another big part of my work is in projects that use spatial technologies.

I think one that I find fascinating, and I learned a lot from, is the study that was recently published by *Nature*. My amazing colleague, Janna Heide, the first author of the study, observed that when tumors express NNMT, there is less immune cell infiltration in those tumors. And the CD8+ T cells that infiltrate the tumor are less activated and less capable of killing tumor cells. She made this observation in mouse tumors, but the big question was: is this relevant for humans? For this, we performed a big spatial transcriptomics experiment and we showed that yes, when cancer-associated fibroblasts express a lot of this protein NNMT, tumors in human ovarian cancer patients also show less activation of CD8+T cells.

It's also one of the great examples that give you hope because our lab has been working with the National Center for Advancing Translational Science at the NIH, who provide drug development expertise to labs. Our lab pitched this project to them and they developed a really good inhibitor for this protein. In preclinical models, the inhibitor slowed down tumor growth and it actually reversed this immunosuppressive phenotype that we observed. Now we have a group of people working on developing it further



and bringing it to the clinic for early-phase clinical trials.

So what fascinates me? It's this, like, wow, things actually work out and we do actually connect back to patient care. I think about that a lot.

What are your hobbies?

I'm a bit of a shy person. I think I just spend a lot of time with my friends outside of work. And I do spend a lot of time with my cats, teaching them tricks, making them happy, and just generally trying to be a good cat owner to entertain them. Apart from that, I like making art. I think I was attracted to pathology because it's very much like art: very colorful and very visual and I love it. And I am making art, trying to learn to paint with different media like watercolors or drawing

"We are discovering these new targets and developing these new tests and I worry: how is it going to be accessible to as many people as possible? How do you make people aware of what you found? Just the diagnostic tests that are required to get into a clinical trial can be challenging. How do we really connect the community that we are serving to these fascinating new discoveries?"

pictures of the city. I'm not saying I'm good at it, but I really, really like colors and visual art.

And you said you like being outdoors?

Yes, to this day I don't know how to drive. I keep saying that I'm learning, but I'm not making much progress, so I have to walk and bike around Chicago. Growing up in that small town, my family never owned cars. We always went everywhere by bike. I think the largest cargo I ever biked somewhere was like 80 pounds. And I don't like working out. But I have to be fit enough to explore as much as I can. I have to work out for this specific reason. And I have so many plans to explore the US, the national parks.

Any favorite music or favorite books? Favorite authors?

I really like this one book. I keep gifting it to all my friends. *The Fox Was Ever the Hunter*, it's written by Herta Muller, who received a Nobel Prize. She is eastern European. She was born in Romania, but the German speaking minority in Romania. And it's a very central Eastern European story. It's about being surveilled by the Romanian secret police. Yes, it's a sad story. But community actually is the most important thing is what I bring home from it. And it's just a very poetic prose.

What issues concern you the most?

We are discovering these new targets and developing these new tests and I worry: how is it going to be accessible to as many people as possible? How do you make people aware of what you found? Just the diagnostic tests that are required to get into a clinical trial can be challenging. How do we really connect the community that we are serving to these fascinating new discoveries? I really do hope that more and more people will have access to this high quality of diagnostics and care that we are working towards. Another thing is access to science. A lot of really talented, smart people just don't get into science because they don't have access to education, or they just don't know that they could do it. I think it needs representation. Access to healthcare and access to education are things that really concern me.