
BIOCEV's Ruth Tachezy: Taking aim at the unexpected

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If the novel coronavirus had never hit, Ruth Tachezy would have been doing other things: applying for funding, heading a national reference laboratory, and publishing. She would have been helping her students at the Faculty of Science and would have been preparing for an upcoming conference and a mountaineering vacation. Instead, she opted to tackle a higher “mountain”, setting her sights on SARS-CoV-2, the pathogen that changed the world drastically in just a few months.



Do you remember your thoughts when you first heard about the outbreak in China?

I do. I tried to be optimistic. In interviews I wanted to calm the public and I didn't admit to myself that the outbreak could go global and turn into a real pandemic. I thought the outbreak would remain local in two or three countries, like the original SARS, that it would be contained. In a way, the events as they unfolded reminded me a little of 9/11. Then, I had been waiting to pay at a gas station and a TV was airing images of the planes hitting the World Trade Center in New York. I didn't realise immediately what I was seeing was real but thought it was “just some stupid film”. But of course, it wasn't. The start of the pandemic was similar: a week earlier, my son, daughter and I were watching a BBC documentary about pandemics and suddenly here we were... in the midst of one.

It might sound strange, but in terms of your profession it must be an interesting period; is it?

I would never say I was happy to have gone through this experience but it's true that “on paper” it was a situation I had always been curious about. It was within the realm of possibility and one could imagine something like this might happen one day. But a real epidemic or pandemic is extremely distressing and difficult to tackle – for all of us – and is not anything anyone can be happy about.

When did you first realise the gravity of the situation?

Before the outbreak spread significantly in Wuhan, friends and I had been organising an annual trip to the High Tatras in Slovakia. We go there every winter. I mostly leave the climbing to others now but still do a lot of trekking and now that my kids are older they often come too and help me carry my backpack to the top (laughs). But as the extent of the crisis became clear, we cancelled our plans – just the first of many restrictions the pandemic brought.



Who did you get your love of the mountains from?

I come from a family of mountaineers and mountain climbers. In the early 1970s, my dad, Jan Červinka, founded a mountaineering club in Vrchlaví. He himself was a famous mountaineer who had been part of Czechoslovak expeditions in the Himalayas, the Hindu Kush, and other major mountain ranges. Today, he is one of the oldest surviving members of the first expedition in Afghanistan. Since he and my mum were passionate about sports and travelled often to the mountains, my sister and I also "caught the bug". That said, I suffered a bad injury in a climbing accident 10 years ago which could easily have cost me my life.

My kids love climbing too, though: my daughter has been climbing since she was 15 and my son, who I tried to dissuade a little from taking up the sport, does orienteering. Now he has gotten me interested in orienteering as well. We all love the mountains, including my husband, whether on foot or on cross-country skis.



Do you remember your first bigger

climb?

My father took me to the Caucasus Mountains and I remember the climb as being extremely difficult and long; in terms of energy I hit rock bottom. Later in life, it helped greatly: whenever I faced a difficult situation where I thought I was “down”, I knew that I still had reserves I could draw upon. The mountains taught me discipline, strength of will and the ability to take responsible decisions at tough moments. It’s like that with many sports. I was a downhill skier, who attended a sports academy and raced and even later competed at university. Regular training teaches you to organise your time. But even though sports were important, my parents still emphasised academic excellence. Had my marks suffered in school, I don’t think they would have let me continue doing sport.

If we turn to work, the coronavirus soon became the main focus, didn’t it?

At first, colleagues and I prepared testing at the Institute of Hematology and Blood Transfusion. Once the lab was successfully up and running, I began testing samples at BIOCEV. Usually I’d be there from around 7 am sometimes to midnight and at home I’d still have to prepare for the next day. The period was intense. Things are now changing: responsibilities at the department are calling; although I remained in touch with my students throughout the crisis, I still felt like it wasn’t enough. I am trying to balance things out now with online courses and individual consultations. I also gave a lot of interviews, for which I had to study all of the latest information. I am continuing to follow the latest epidemiological information, answer dozens of emails a day and handle numerous calls. On top of that, you have regular organisational tasks and problems that arise. And of course each day at BIOCEV, we have to release the results from hundreds of samples.



What first drew you to microbiology when you were younger?

I was always interested in medicine. My mum, a paediatrician, worked until she was 86! I liked going with her to the hospital. I wondered who her patients were and what treatment they were receiving. My mother liked microbiology and recommended me a book on the subject that became my favourite. My aunt, who was a microbiologist at the National Institute of Public Health, was also a big inspiration for me. I longed to become a doctor and even to take part in rescue missions around the world. Circumstances, however, kept me at home: first the former communist regime made it impossible to travel, and later when we founded a family, I did not want to be away from my children.

How did you put together your current team?

There was a lot of enthusiasm. It was an emergency situation and we were in a position to help. Scientists are a very specific community: most of us are happy to stick to our research and there is usually quite a bit of rivalry. But here a lot of people got involved very quickly and one of the reasons we got up and running so successfully was because of support from BIOCEV management, the Faculty of Science, and also Vice-Rector Jan Konvalinka. They made it possible to begin proper testing, quickly.

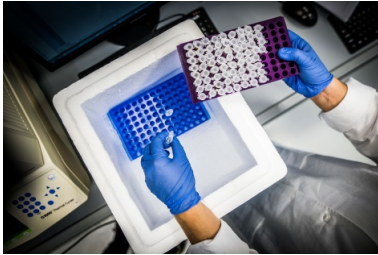
Have you ever joined forces against a “common enemy” with others? With someone who might otherwise have been a rival? It happened a lot before the fall of communism in Czechoslovakia in 1989 when the common enemy was the regime. That brought us together then – in the labs and even in the mountains. We had a lot of fun, felt safe in each other’s company, shared a lot similar views and felt very little rivalry at all. This was a little bit similar.



Do

you have a favourite story from those days?

The most personal one is from my marriage. My husband is a parasitologist; in 1986, before we married, he left for two years on an internship in China. There were no mobile phones, email didn't exist, and letters took weeks to arrive and were censored. I was head-over-heels in love and he just disappeared. I very much wanted to travel to see him but wasn't given permission by the state. So we came up with the idea of getting married at the embassy in China in line with the Helsinki Accords. But that was also rejected. You know what happened? My partner filled in the necessary papers in China, and I got married in Vrchlabí with a friend acting as a surrogate during the ceremony! Once married, I thought the authorities would have to let me go and see him. And they didn't! They claimed I didn't have the sufficient capital to go. At the time, my father was at basecamp at Mt. Everest but when he heard about it, he contacted his sister in Switzerland and asked her to send me 300 dollars. I got the funds and became eligible. I hunted down all the necessary documents from the ministries of education, finance and foreign affairs and then waited for three days at the then-state travel agency Čedok to get a train ticket from Ulaanbaatar to Beijing. No obstacles remained and I was able to reunite with my husband.



And here we are: today, you are a top scientist and once again China is the centre of the story...

I try to do my job as best I can and I enjoy it. In science, nothing is ever complete, there is always more to be done, and there are always things that could be done better. My parents didn't teach us to relax. In the 1990s, I worked with great enthusiasm to improve screening for cervical cancer. I was focusing on related viruses. I spent a considerable part of my career fighting for vaccines against human papillomavirus, and it wasn't easy and came down to money. The intensity was similar to what I am experiencing now: it was necessary to fund research through grants and to back studies running then. It made sense to me. I always asked people I wanted to work with if they wanted to do something together that would matter, or make a difference. Something they wouldn't be paid for, for which there'd be no medal. I don't know what must have gone through their minds, maybe they would rather have killed me (laughs). But the fact that people came on board was great: on your own, you wouldn't get the same results.



Where are we when it comes to the

coronavirus pandemic? Is the end far? Or near?

I am a little afraid that the “easiest” solution, developing a vaccine for broad immunisation, is probably not just around the corner. A vaccine stimulating the production of antibodies is certainly the best hope, but it may not succeed, for many reasons. Another approach can be a vaccine stimulating a T-cell response, capable of wiping out infected cells. That road is even more uncertain and difficult. All the same, I want to be optimistic and believe we will come up with a vaccine, even if it takes longer.

What about effective treatment?

There might be a greater chance there: tens of thousands of molecules are being tested and it is possible some will prove effective against the illness. If they stopped the potential infection of additional cells, they could be used preventively. But to manufacture enough to “cover” the entire world population is a much greater challenge than tackling a local epidemic.



How do you see the lifting of restrictions and return to normal life?

I think that the head of the country's healthcare statisticians, Ladislav Dušek, and Professor Roman Prymula, who is the deputy health minister, did a fine job and I think decisions that were taken were correct. What happens next will depend a great deal on how people will behave and whether they will continue to respect restrictions as they are lifted. If you suddenly have crowds of people waiting for beer, that's not following recommendations. It would be easier perhaps if the virus were "visible". The coming days will determine where we go from here, but if people who are annoyed and tired of restrictions suddenly throw all caution to the wind, there could be local outbreaks and hot spots. On the other hand, if people are careful, the warmer months may see transmission of the virus stop.

And then?

It's possible the novel coronavirus will just disappear one day with "a snap of the fingers", but it's not very likely. If it comes back, it could become seasonal, like the flu. Ahead of us is a period where there will be fewer serious cases, I think, but in my opinion, it will take roughly a year before restrictions are completely lifted. But I think it's the only way forward. We'll have to keep a close eye on developments and in the case of sudden increases of cases, temporarily tighten restrictions again. The main task is to ensure the virus doesn't ever swamp the healthcare system. Certainly, it hasn't been easy, especially for families with little kids. But also for people who live alone.

Ruth Tachezy, Ph.D., was born in Olomouc, in the former Czechoslovakia. She studied molecular biology and genetics at the Faculty of Science at Charles University, receiving her doctorate in molecular virology. She is a researcher in the Department of Experimental Virology at the Institute of Hematology and Blood Transfusion and the head of the National Reference Laboratory for Papillomaviruses and Polyomaviruses. She heads the Department of Genetics and Microbiology at the Faculty of Science.