FACES STIFTUNG CHARITÉ

From Zurich to Berlin, by bike if need be – research cooperation in the middle of a pandemic

Viola Vogel is a professor at ETH Zurich and an internationally renowned expert in the field of mechanobiology. Since 2018 she has been sponsored by Stiftung Charité as an Einstein BIH Visiting Fellow, and regularly travels to Berlin for this reason. We first met her for an interview in autumn 2018. Today, two years later, we meet again – via video, in the midst of a pandemic. Together with her Berlin host Prof. Dr. Georg Duda[1], we exchange information about the pro-gress of their joint project in the field of tissue regeneration, plus we talk about their personal experiences and challenges during the Covid-19 pandemic.

Professor Vogel, you're in Zurich right now. Professor Duda, you're in Berlin. We're delighted that you've taken the time for us today. Video meetings are no longer anything special, and have become significantly more frequent in the last few weeks and months.

Duda: Yes, thank you very much, we're also looking forward to the interview.

Vogel: And we'd like to take the opportunity to say thank you for the 2-year extension of the funding for our project.

Congratulations again on the extension. How would you describe your collaboration in recent years, and what can we expect in the second phase of the project?

Vogel: The Einstein BIH Visiting Fellowship from Stiftung Charité has completely enriched my scientific life. Georg and I have known each other professionally for a long time. We're both very complementary in terms of our research approaches, our training and our research questions. This creates a very interesting interplay between Zurich and Charité. For this purpose, we've found excellent colleagues at both locations who are absorbed and enriched precisely in this special collaborative atmosphere.
Another positive aspect is that the entire project benefits from the synergy of the different networks Georg and I have at Charité and beyond. This has enabled us to build a new international network, which neither of us could have done alone. At the beginning of the Covid crisis, we discussed intensively in this network how we could use the tools we'd developed to make a positive contribution to the crisis. We're thinking specifically of the diagnosis of fibrotic changes that lead to the long-term consequences of Covid-19, which are being described more and more frequently. A great deal of dynamism has sprung from this and we've already begun a first pilot project. I personally feel that the intensity of the interaction has grown fantastically at all levels.

Duda: I can only reiterate that. We're currently developing a little differently from originally planned, and now also devoting our efforts to the subject of the SARS-CoV-2 virus. However, we're remaining true to the core of the fellowship, namely research into the mechanobiology of

[1]*Prof. Dr. Georg Duda is Director of the Julius Wolff Institute and Professor of Engineering Regenerative Therapies at the Berlin Institute of Health (BIH) and at Charité.*

tissue growth and tissue regeneration.

This is of course extremely topical. Can you explain in more detail how you're now dealing with the novel virus in your research? Is there any hope of developing a treatment out of this?

Duda: At Charité we're very active in this area and our research results have triggered various clinical studies in the US that we were unable to carry out ourselves because, fortunately, there weren't enough patients in Germany. The BIH Centre for Regenerative Therapies (BCRT) initiated a study for intensively treated coronavirus patients at a relatively early stage. This involved local immune modulation using stem cells, which suppresses pro-inflammation. However, Viola would like to bring in an exciting new facet that hasn't yet been at the centre of the coronavirus discussion.

Vogel: In Zurich we developed a nanoprobe that can read the mechanical stress state of fibres. If these fibres are in a pathological transformation process, for example in tumours, our probe detects it. We have a tool here that can identify diseased tissue developing towards fibrosis. Fibrosis is the major problem of the secondary consequences of Covid-19. The question now is to what extent we can possibly use this sample in people with Covid-19 to show whether, for example, the heart, lungs or other organs have been damaged. However, to be able to try the sample in humans at all, we first need studies with human tissue. We've now started that at Charité. So we deal with the secondary effects and the consequential and long-term damage of Covid-19. Incidentally, this is a research area that, with all due respect for the various current Covid-19-related ad hoc funding, has so far been completely underfunded on the German and international funding scene.

On the purely scientific level, the pandemic has also brought positive impulses. But how has it concretely restricted your everyday research? What challenges have you experienced?

Vogel: When we couldn't carry out any experiments because our laboratory was completely closed, that naturally slowed us down.

Duda: Yes, the labs were closed. That cost time. But the start-up after the closures was also slower than expected. Although we were able to reopen the laboratories relatively quickly, we had to implement and adhere to the new Covid-compliant regulations. Colleagues had to be trained in this. That was a relevant – though completely understandable – hurdle time-wise.

Vogel: For me personally, the biggest challenge was teaching. We had to switch an undergraduate course with 250 students from face-to-face to online learning within a week. The lectures themselves were less of a problem. But how do we organise the practice lessons? How can we communicate with the students? And how do we structure the communication between them and, for example, the TAs (technical assistance, editor's note)? All these issues had to be clarified within a very short time.

Did you feel the same way, Professor Duda?

Duda: The Julius Wolff Institute and the BCRT completely digitised the teaching relatively quickly. In general, I think that as scientists and teachers we've mastered many pressing challenges quite well so far. However, I see a major challenge in the fact that we'll possibly remain in this mode for a longer period of time and have to think about what it might look like in the future. How do

I integrate new colleagues into the existing systems? How do I maintain the creative atmosphere of an institute? This is especially important to Viola. How do I ensure that colleagues feel comfortable with us, but also have high expectations? We also see concerns among young academics, especially young PhDs. They're insecure because there are no congresses and they can't easily build up an international network, which is important for a successful academic career.

That's difficult, of course. Aside from the partial return to physical operation, are there any digital solutions?

Duda: No, there are no really good solutions. Viola and I both try, of course, to make everything possible digitally. But the personal conversations, especially with PhDs, are very lacking. Personal exchange between employees outside laboratory work is also greatly missed, and sometimes employees meet outside while observing the social distancing rules.

Vogel: It was exactly the same for us. At the moment we're allowed to meet outside, so we recently held a small farewell party at the edge of the forest, spaced well apart. Personal interaction is so valuable and important. As far as possible we do everything digitally, but there are topics that simply can't be discussed via videoconference. For a career interview or when a student is in crisis, you just have to sit down in person.

Duda: Sometimes there are also very unconventional solutions that we couldn't have imagined before this pandemic. One of our employees cycled from Zurich to Berlin to get back to his family after the lockdown and border closure.

Vogel: We won't forget that anytime soon.

September 2020
Marie Hoffmann