



SURVIVED AND THRIVED HAKAN CEYLAN

Dr. Hakan Ceylan is an Assistant Professor of Biomedical Engineering at Mayo Clinic, College of Medicine and Science. His research focuses on developing medical robots the size of a single human cell and programmable biomaterials for tissue engineering. He received his BSc. degree in Molecular Biology and Genetics and his Ph.D. degree in Materials Science and Nanotechnology in 2010 and 2014, respectively, from Bilkent University, Ankara, Turkey. He was a post-doctoral researcher from 2014 to 2017 at the Max Planck Institute for Intelligent Systems, Stuttgart, Germany, where he was later promoted to Senior Research Scientist position to stay there until the end of 2021. He was an Associate Fellow of the Max Planck ETH Center for Learning Systems from 2015 to 2022. He won the 15th Günter Petzow Prize and several best paper, best talk, and science-as-art awards. Ceylan's inventions have resulted in three international patents and over thirty publications in the leading peer-reviewed multidisciplinary journals. He has given invited talks and lectures at universities, research institutes, and forums worldwide. His passion is to maximize the human lifespan, happiness, and power by advancing minimally invasive interventions and targeted therapies with microscopic medical technologies. – Address: Mayo Clinic, Collaborative Research Building, 13400 E Shea Blvd., Scottsdale, AZ 85259, USA. E-mail: ceylan.hakan@mayo.edu.

When the pandemic of bubonic plague arrived in Cambridge in 1665, Isaac Newton had to escape from Trinity College to his hometown Woolsthorpe for “self-isolation.” He used this precious “obligation-free” time to think about the scientific questions that most interested him. This retreat eventually allowed him to invent calculus, create the science of

motion, and unravel light and gravity. This historical example greatly inspired me when starting my College for Life Sciences fellowship at the peak of one of the most notable global events of this century, the Covid-19 pandemic. Like the rest of the world, the pandemic inevitably lessened the opportunities in Berlin and the Kolleg. However, my Newtonian inspiration to study outside the traditional realm of my research, i.e., my laboratory, motivated me even further to join Wiko at the second peak of the global pandemic.

My initial goals during my stay were (1) surviving a global pandemic, (2) connecting with the biomedical research community of Berlin, (3) and identifying realistic medical problems for which my research on microscopic robots can make a disruptive or radical impact.

With these thoughts in mind, I moved to Villa Walther on the last day of August and received a beautiful office in Villa Jaffé. My office and work were about 10 min walking distance apart. The accommodation and work environment provided by Wiko was extraordinary and stimulated creative thinking in every way throughout my stay. Grunewald, where the Wiko campus is located, is one of Berlin's most likable and peaceful corners, shaped by lakes and old villas. As described by the then-Secretary Thorsten, the villas in this neighborhood were built by the "old money," referring to Berlin's late 19th- and early 20th-century elites. The neighborhood protrudes into the Grunewald forest, allowing us excellent opportunities for academic and social activities.

Berlin is an essentially flat city, so I leased a bicycle the first week I arrived. It was such fun to discover the magnificent city in the fall before the cold of winter arrived. At the same time, Wiko lunches started. It was an obligatory part of my fellowship – along with all the other Fellows – to share lunch every day, except Thursdays. This year there was an exception due to the pandemic, such that Fellows could waive this obligation if they felt uncomfortable being in a relatively crowded environment. I joined every lunch, but at some point, they turned into a home delivery service due to the tightened pandemic restrictions. Thursday meals were turned into famous Wiko dinners, which were marvelous. I was fortunate to have joined a few of them. I must acknowledge Dunia and her teams' exceptional ability to handle diverse personal requests, likely doubling the required effort every year due to the chaotic regulations of the pandemic.

My first objective at Wiko, surviving the global pandemic, was of partial success. I fell victim to Covid-19 in the second week of December, despite my aggressive use of protective equipment and social distancing with people as much as possible. I had to do 15 days of self-isolation, and the overall course of the disease was moderately mild, including lots of coughs and the loss of my senses of taste and smell. I was greatly indebted to Madeleine

Beekman, Benjamin Oldroyd, Shamil Jeppie, Marcelo Aizen, and Vera Pfeffer for their special caring and invaluable support during this period. During this time, all the Fellows wrote to me, wishing me a speedy recovery. I wholeheartedly felt that Wiko was like a family to me, and a lasting bond was cemented.

Concerning my second objective, connecting with the biomedical research community of Berlin, I gave more than ten scientific talks to disseminate my research data. I felt privileged to give a Tuesday Colloquium. The questions and encouragement after the talks were constructive and sparked new directions in my thinking. I was among the few lucky ones who could give an on-site Tuesday Colloquium at Wiko because soon after, all such large gatherings were canceled to impose tighter social contact. My other talks had to be online, as most of the institutions in Berlin were either in home office mode or were entirely closed to non-employees. Among these talks, the one with Berlin Partner for Business and Technology GmbH, Healthcare Industries, MedTech Cluster was particularly productive towards my third objective. We have started exchanging ideas with Prof. Thomas Picht from Charité Universitätsmedizin towards collaboration.

I did several faculty interviews during my time at Wiko. Daniel Schönplüg, Madeleine Beekman, Benjamin Oldroyd, Shamil Jeppie, Marcelo Aizen, Bettina Schwab, and Ugur Kilic ensured that I prepared well for these interviews. I cannot overemphasize the significance of their contributions to my receiving offers from major European and American universities and institutions. Eventually, I took up the faculty position offered by the Mayo Clinic, where I am currently working.

The time also allowed me to prepare a comprehensive review article on the medical applications of miniaturized robots that is currently in the final stage for submission for peer review.

Last but not least, I was beyond thrilled to receive a farewell video from my amazing friends at Wiko. It was regrettable to leave these amazing people after six months. However, I felt fortunate to come back in June for the final farewell party.

Wiko, at least for people in natural sciences and engineering, is a paradise. It provides ample time and opportunity to think about the next big thing in one's professional career, which of course, on the medium and long time scales, reflects positively on society and the overall intellect.

Knowing that I would be devoting all my time to interacting with the biomedical research community in Berlin, I took some time to explore my new surroundings, visiting museums, local swimming pools, and lakes around Berlin. With Bettina Schwab's lead and Shamil Jeppie's captainship, we started a running club, the Wicked Wiko Runners Club, with a

group of Fellows with exclusive T-shirts that we had made. My wife – then my partner – first joined in mid-December due to the travel restrictions imposed on non-EU countries during the Covid-19 pandemic. I am incredibly grateful for Vera Pfeffer's and Nina Kitsos's support so that she could eventually make it and experience the unique environment of Wiko.

When I was at the Kolleg, I had been in Germany for over six years. However, my heavy laboratory and administration-oriented work duties at my former research institution severely limited my capacity to learn sufficient German language. Eva von Kügelgen made sure that I was appropriately moved up to B1 level German (officially certified by independent authorities soon after leaving Wiko!). Soon after we started our German course, we had to move online because of the tightened restrictions. However, this later helped us; even after my fellowship ended, she was so kind to invite us to the online classes. The language course went beyond teaching German; it catalyzed a special bond among the Fellows participating.

The movie night event was an excellent initiative organized by Katya Assaf-Zakharov to foster discussions about interesting topics. The Fellows compiled an interesting list of movies. We also planned a special movie night together with Jan-Werner Müller to discuss the lives and interactions of the Turkish community in Germany. Unfortunately, the tightened restrictions during the second wave of the pandemic did not allow the movie nights to continue.

Berlin is a city known for its countless most extraordinary museums. I had a long list of museums that I wanted to visit each week. However, the tightened restrictions limited this goal to only the Deutsches Historisches Museum, a colossal museum needing attention for two full days. The same disappointment also occurred regarding the discovery of rich Berlin cuisine. By late October, most of the restaurants were closed down. Although I could order food from some restaurants I wanted to visit, this did not fully substitute for the on-site experience. Especially after catching the Covid-19 virus, my lack of appetite precluded new tastes for some time.

Overall, I consider my experience at Wiko a total success despite the limitations of the pandemic. I have learned a lot from a culturally diverse and rich environment. It transformed my lifestyle and daily routines drastically. Wiko impacted many aspects of the way I think, communicate, and express my thoughts. I have made many new friends from all continents. There are at least a dozen other great names I cannot mention here due to the space restriction. Nevertheless, their contribution to a new me after my fellowship ends is beyond measure. I am beyond thrilled to know that I am always welcomed in Berlin and I see Wiko as my house therein. At the end of six months, I realized I found much more than I had come for.