Tests for all

ETH bioengineer Yves Blickenstorfer (left), currently in the final stages of completing his doctoral thesis, and Pioneer Fellow Alexander Tanno met in the laboratory.

ETH graduate Alexander Tanno wants to bring quick and easy-to-use home blood tests to market. His technology could also play a key role in a pandemic situation.

“Apologies for the delay in getting back to you. I had an important deadline,” begins the email from Alexander Tanno. The April deadline was for a proposal for a COVID-19 research project that he submitted in collaboration with researchers from Professor Janos Vörös’ Laboratory of Biosensors and Bioelectronics at ETH Zurich and University Hospital Basel, plus specialists from Swiss industry. An evolution of his technology for quick, flexible, easy-to-use blood tests could not only play a key role in combating a future pandemic, but also help in thecurrent crisis.

From research to product

Long before the coronavirus crisis, biomedical engineer Alexander Tanno set himself the goal of developing sensitive blood test kits that are small and accurate. They are based on a lateral flow test that, like a pregnancy test, produces lines to indicate a qualitative result: pregnant or not pregnant. Many medical diagnoses, however, require quantitative tests and, until now, these could only be run on expensive equipment in laboratories or medical practices. In the course of his doctoral thesis at ETH, Tanno developed a process for quantitative blood tests that are so compact and manageable that patients can take them anywhere. He decided to develop his technology into a marketable product and, as a result, was awarded a Pioneer Fellowship in January 2020. The fellowship programme, funded by ETH and private donors, provides up-and-coming young entrepreneurs such as Tanno with start-up capital, access to the ETH laboratories, training and mentoring.

Potential for future pandemics

The focus of Tanno's start-up Hemetron depends on the submission of the COVID-19 research project; if it is approved, the team will initially work on developing the technology into a test that can verify infection with the new coronavirus. The aim is to create a home test that is just as accurate as laboratory tests, but quicker and cheaper. The user-friendly test will have a simple design and come with explanatory videos, and the anonymised results will be uploaded automatically to databases or a GP's inbox. It will also be possible to adapt it to detect other pathogens in the event of a new pandemic. "If everyone is able to test themselves regularly and takes the necessary precautions such as self-isolating, we could take a huge burden off the health system right from the outset and avoid a blanket lockdown," asserts Tanno.

Despite the fact that they are still waiting for a decision, he and his start-up partner Yves Blickenstorfer, who is currently completing his doctoral thesis at ETH, have been able to continue their work. "At the moment, we are improving aspects of our technology that aren't dependent on which test we ultimately develop," explains Tanno. There are a wide range of potential applications for Tanno's technology, from monitoring inflammatory diseases such as rheumatism and checking medication dosage to early detection of a heart attack. The focus is on creating something that improves the patient's quality of life and has the potential to save lives. The young entrepreneurs are driven by the vision that a home blood test kit will, like a thermometer, become an everyday household item some day.

Crisis as opportunity

Although young entrepreneurs are facing serious funding issues as a result of the coronavirus crisis, some of the developments triggered in Tanno's specific case have been very positive: "Suddenly everyone has realised how important it is to have fast and reliable tests," he explains, confident that the team will make up for the lost time in the lab and the fact that networking has become more difficult. Also in their favour is the fact that he and Blickenstorfer are still in the early stages of their project; they are not burdened by infrastructure or staff costs, and thanks to the Pioneer Fellowship, they can concentrate fully on their start-up. "We are working flat out to get our technology ready to use and ensure that it is able to make an innovative contribution to our health."

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Thanks to the Pioneer Fellowship, we have the time we need to develop the results of our research into a marketable product.

Alexander Tanno