

ETH Zürich Foundation

Uplift

The impact of giving N°4



How we can prevent future pandemics

Biostatistician
Tanja Stadler

—
page 7

My commitment to equal opportunities

Donor Sandro Mollet

—
page 12

Support

**Research
for our health**

“We need to see further progress in the prevention, diagnosis and treatment of disease. Health research is about planning for the future and given the painful experiences of the last few months, it is more urgently needed than ever. Thank you for your support.”

—
Joël Mesot,
President of ETH Zurich

IMPRINT

Publisher ETH Zurich Foundation **Editorial** Isabelle Vloemans, Andrea Zeller
Design, illustration Kristina Milkovic **Photography** front cover: ETH Zurich / Yves Bachmann,
back cover: Stefan Weiss, Partners in GmbH
Printing Neidhart + Schön Print AG, Zurich **Proofreading and translation** Supertext AG, Zurich
Contact www.ethz-foundation.ch/en, uplift@ethz-foundation.ch, +41 44 633 69 66



Tests for all

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 the current 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. →

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

Alexander Tanno



Stefan Weiss, Partners in GmbH

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



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."

Offer your support at www.ethz-foundation.ch/en/technology-health and www.ethz-foundation.ch/en/pioneer-fellowships

Tanno's invention enables the creation of sensitive, portable blood tests.

→ 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

Bringing bright ideas to life

Every year, a panel of experts awards 10 to 15 Pioneer Fellowships. ETH Zurich is keen to expand this important funding programme, which is financed largely through private means. The road from research to marketable product is often long and arduous. Support in the form of a Pioneer Fellowship brings ambitious researchers a significant step closer to their goal, and technologies that have the potential to shape many aspects of our future society are able to reach the market faster. Everyone who supports the programme is part of its success – from initial idea to successful commercial application. The support also helps to promote Switzerland as a centre of innovation.

The data hunter

The research carried out by ETH professor Tanja Stadler has the potential to deliver key information that could nip future epidemics in the bud. The crucial factor is how quickly she can get her hands on good data.



Having started out as a mathematician, you're now a biostatistician who tracks epidemics by comparing the genetic data of a virus in different patients. How is that done?

TANJA STADLER – Viruses are also subject to evolution: they change continuously. These changes allow us to trace the origin of a virus and map its geographical spread, essentially in real time.

With reference to the coronavirus pandemic, can you explain what we learn as a result?

TANJA STADLER – As soon as we start travelling again, we will look at questions such as: how many of the infected people in a particular region were infected there and how many caught the infection elsewhere? These findings can complement the tracing of carriers and those with whom they have

been in contact, and enable the authorities to adapt their healthcare policies if necessary. Another major benefit of our method is that we are able to calculate the number of unreported cases in an epidemic – always assuming that we have enough virus samples. To evaluate the situation in Switzerland, we are working with a diagnostics company that provides us with all their examined samples of Sars-CoV-2 in an anonymised format.

A third of the researchers in your group are mathematicians, a third computer scientists and a third biologists – how do these disciplines work together?

TANJA STADLER – You can picture it as a loop: the mathematicians develop models that allow statistical estimations to be made. The computer science researchers are crucial because we are working with very large data

“To prevent future pandemics, very fast, standardised and transparent data gathering is crucial.”

Tanja Stadler

sets, so we need good algorithms. The biologists then interpret the estimated results and provide feedback to the mathematicians, so that they can refine their models. We are also examining how we can process and link new types of data, for example linking epidemiological and genome data.

Alongside your research, you also teach – how have you found the experience of teaching online?

TANJA STADLER – It's going surprisingly well. But I'm very much looking forward to standing in front of the students again. When I'm teaching a group of 70 to 80 students on a platform such as Zoom, I can't see all their faces at the same time. If you don't have that feedback from the faces and the body language, it's more difficult to tell when people are struggling to understand.


Do you have the impression that society has given more weight to the voice of science over the past few months?

TANJA STADLER – I think that today, more people understand that scientists may work on very timely topics of direct relevance to society. My hope is that the pandemic has given more people an insight into how science works and how we come to our findings – and that more attention will be given to fact-based arguments in future.

What do we need to prevent future pandemics?

TANJA STADLER – Very fast, standardized and transparent data gathering is crucial, so that we can see immediately if a problem emerges somewhere. It's the old adage: if you can't measure it, you can't manage it. That's

why it's so important to drive forward digitalisation in the area of epidemiology and set up suitable structures, always respecting the individual's right to privacy. We have to be able to intervene at an early stage, before an epidemic turns into a global problem. My vision is that by making the observed and gathered data available immediately, we will gain a detailed insight into any emerging epidemic literally overnight in the future.

 Support the Corona Impulse Fund and help boost our resistance to pandemics: www.ethz-foundation.ch/en/corona-impulse-fund



Tanja Stadler's group is not only investigating how whole species evolve and die out, but also how pathogenic viruses and bacteria are spread.

About Tanja Stadler

Tanja Stadler grew up near Stuttgart and studied for her degree and doctorate at TU Munich. Today she is Professor of Computational Evolution at ETH Zurich's Department of Biosystems Science and Engineering. She lives in Basel and is the mother of two small daughters.

Technology for our health

Children

Drops to alleviate infant colic
(Pioneer Fellowship "BactoKind")

Optimal skin replacement for
children with burns

CYBATHLON @school raises
youngsters' awareness of the
needs of people with disabilities

Funded in 2019 by:

Béatrice Ederer-Weber Stiftung, EBGB,
Ernst Göhner Stiftung, IMG Stiftung,
Kellerhals + Haefeli AG, MBF Foundation,
SCS Swiss Child Support Foundation,
Stavros Niarchos Foundation, Swiss Life
"Perspectives" Foundation, Dr Walter
and Edith Fischli and numerous other
contributions both large and small



Elderly people

Prevention of cancer, diabetes and other
age-related diseases through lifestyle changes

Prevention and treatment of dementia,
thanks to molecular research into ageing

New scanner for the early detection of
dementia (Pioneer Fellowship "Positrigo")

Development of a new method for the
early detection of Alzheimer's

New approaches to skin cancer research
(see page 15)

Development of a reliably functioning
artificial heart

Mobile health monitoring for older
and chronically ill individuals

More accurate diagnosis and treatment
thanks to interdisciplinary research
and development at The Loop Zurich

Software for faster discovery
of biopharmaceuticals
(Pioneer Fellowship "aiNET")

Pioneering MIDATA platform for a secure
connection between patients, doctors
and researchers

New, interdisciplinary competence
centre for inclusive, holistic rehabilitation

Early detection of lymphoedema
(Pioneer Fellowship "Dicronis")

New drugs as a substitute for
chemotherapy (Pioneer Fellowship
"Phire Therapeutics")

Personalised cancer treatment with the
aid of molecular science

Fast, sensitive home blood tests
(Pioneer Fellowship, see page 4)

Highly sensitive device for the detection
of disease in the air we breathe

Wearable "SleepLoop" technology for restful
sleep without medication

All age groups

Research and the transfer of new findings into medical practice, new technology and the funding of entrepreneurially minded researchers are crucial in order to significantly improve the quality of life of people of all ages. Which project would you like to see come to fruition?

Offer your support at www.ethz-foundation.ch/en/technology-health and
www.ethz-foundation.ch/en/pioneer-fellowships

**Corona
Impulse Fund**

The ETH management releases
these funds quickly and
unbureaucratically, focusing on
where the support is needed
most and will have the greatest
impact, in order to:

- improve our resilience
to this coronavirus crisis and
any future pandemics.
- quickly implement priority
research projects related to
the coronavirus.
- support the health service
with the rapid development
of materials and engineering
solutions.
- extend ETH scholarships
where needed.

Offer your support at
[www.ethz-foundation.ch/en/
corona-impulse-fund](http://www.ethz-foundation.ch/en/corona-impulse-fund)

Recognising the finite nature of existence

Exceptional circumstances are nothing new for Sandro Mollet. The 38-year-old ETH alumnus, who has made a bequest to the ETH Zurich Foundation in his will, spent two years as a UN military observer.

Where did you find yourself when the coronavirus crisis began?

SANDRO MOLLET - Halfway through the WK (the annual military reserve duty). As the commanding officer, I am stationed with our battalion in Spiez. Our mission is to provide support for the Spiez Laboratory when demand for testing is high – as it was, for example, in 1986 following the nuclear disaster in Chernobyl. Since our WK this year coincided with the outbreak of the coronavirus, our biologists are on a real deployment and are helping the lab staff to carry out the coronavirus tests. In my military role, it's a major advantage that as a chemist, I'm familiar with the work in the lab.

Before that, you were stationed in south Lebanon, in Damascus and on the Golan Heights between Israel and Syria as a UN military observer. Why did you choose these missions?

SANDRO MOLLET - I grew up in the Olten region and after secondary school I studied chemistry at ETH Zurich. While I was studying for my doctorate, I taught chemistry part-time at the cantonal school in Olten. After several years as a teacher, I wanted to broaden my horizons and do something meaningful at the same time. So I applied for the first posting in summer 2015. That's when I wrote my first will, aged 33. →

“Great potential should never be constrained by a lack of support.”

Sandro Mollet



Switzerland has been providing military observers – also known as “blue berets” – for United Nations peacekeeping missions since 1990. As part of one such mission, Sandro Mollet was stationed near Marjayoun (south Lebanon) in 2017. Today he is a battalion commander in the Swiss Armed Forces, in charge of 600 soldiers.

→ *What prompted you to write a will when you were still so young?*

SANDRO MOLLET - It was part of the checklist I was given before my first tour of duty as a military observer. You are asked whether you would prefer a civil or military funeral in the event of your death while on duty and advised to write a will – observers are very close to hostilities and the duty can be high-risk at times. At moments like that, you become very aware of the finite nature of your existence.

What prompted you to include the ETH Zurich Foundation in your will?

SANDRO MOLLET - I want to make a contribution to ensuring a more equal playing field: I want the unique opportunities that ETH Zurich offered me to be open to talented people who would not be able to study without financial support. I contacted the ETH Zurich Foundation to work out the most effective way of formulating my wishes. My motivation was also based on personal experience: during my time as a teacher in Olten, a gifted student in one of my classes was offered the opportunity of a short natural sciences internship at ETH. She almost had to turn it down because her family could not afford the train fare to Zurich for the week. Luckily, the school administration managed to come up with a solution. After finishing school, the student went on to complete a degree in biomedical sciences at Fribourg. For me, the lesson of the story is that great potential should never be constrained by a lack of support.



Legacy and appointment as heir

With a legacy, you can bequeath a fixed amount or certain valuables to the ETH Zurich Foundation and you may, if you wish, also specify the purpose for which it will be used. In contrast, you can leave the ETH Zurich Foundation a proportionate or percentage share of your estate in the form of an inheritance.



Information on legacies and appointments as heir to the ETH Zurich Foundation can be found at www.ethz-foundation.ch/en/nachlass



Find out more about ETH needs-based scholarships at www.ethz-foundation.ch/en/eth-scholarships

New approaches to skin cancer research

White or light types of skin cancer are the most common form of cancer and are increasing rapidly. With your support, ETH Zurich and University Hospital Zurich are breaking new ground in their prevention and treatment.



ETH professor Sabine Werner is heading the major SKINTEGRITY venture, which encompasses a range of interdisciplinary research projects.



Funding partners wanted

The fact that ETH Zurich's Engineering faculty is involved in SKINTEGRITY makes the joint project unique. "This is an extremely innovative factor and our strength," stresses Werner. The combination of biology, engineering sciences and clinics allows young researchers to work at the interface between disciplines. "These are tomorrow's scientists and they're in a position to make genuine progress," explains the ETH researcher.

The SKINTEGRITY sub-project devoted to light types of skin cancer includes a four-year doctorate. Half of the costs of this are met by the participating professorships. The ETH Foundation is currently seeking donors as well as partners from foundations and companies to provide the remaining funding for this important research.



Support SKINTEGRITY at
www.ethz-foundation.ch/en/skinintegrity

SKINTEGRITY

The numerous sub-projects that make up the SKINTEGRITY venture extend from the manufacture of artificial skin for transplants to an imaging system for the early diagnosis of lymphatic disease.

Your support enables:

- **expansion of the research and teaching of the 30 participating professorships, including 10 new doctoral projects**
- **new approaches to preventing and healing skin diseases**
- **new impetus for the Swiss medical technology and pharmaceutical industries**

Every year, 15,000 people in Switzerland receive a diagnosis of a light form of skin cancer, and the numbers are on the rise. One of the reasons behind the dramatic increase in white skin cancer, a condition that is often barely noticeable, is the sun's ultraviolet light. This type of skin cancer primarily occurs on what are known as the body's "sun terraces": the nose, forehead, lips, ears, neck and hands. Longer life expectancy may also play a role, as there is a suggestion that certain age-related changes in the skin encourage cancer to develop. Researchers at ETH Zurich and the University of Zurich want to examine the processes involved here more closely in order to develop new approaches to the prevention and treatment of skin cancer.

The project is led by Professor Sabine Werner from the Institute for Molecular Health Sciences at ETH Zurich and Professor Reinhard Dummer from the Department of Dermatology at University Hospital Zurich. The ETH professor is also co-leader of University Medicine Zurich's interdisciplinary flagship project SKINTEGRITY, in which 30 research groups are examining the causes of skin diseases and wound healing disorders and developing new diagnostic processes and treatments. The aim is to establish Zurich as a world-leading centre for skin research.

"We need your support now more than ever to ensure we are properly equipped to face future challenges. Let us begin where there is potential for significant breakthrough: with new scientific findings that will enable us to live long, healthy lives."

Paul Hälg

Chair of the Boards of Directors of Sika Group and Dätwyler,
 member of the Board of Trustees, ETH Foundation

Your contribution to our future

Science and technological innovation are more important than ever. We need answers to challenges that affect us all: from climate change to our health. The keys to success are exceptional talent, excellent research and teaching, strong partners – and you. **Help support talent and research at ETH Zurich!**



Text

Text "ethzf" and the amount you want to donate to 488.
For example, "ethzf30" to donate CHF 30 (maximum donation CHF 100).



Website

Donate by credit card, PostFinance, PayPal or TWINT:



Bank transfer

Bank: Credit Suisse AG, 8070 Zurich
IBAN: CH87 0483 5027 0482 3100 0
Post account number Credit Suisse:
80-500-4
Payment reference: Uplift 4EN

For donations in euros or US dollars:
www.ethz-foundation.ch/en/bank-details



Personal support

There are many ways to support research and teaching at ETH Zurich. We would be happy to discuss the options with you – so your support can have the greatest possible impact.

We look forward to hearing from you!
Email: uplift@ethz-foundation.ch
Tel: +41 44 633 69 66



A portrait of Alexander Tanno, a man with short brown hair and a light beard, wearing a blue blazer over a light blue shirt. He is smiling slightly and looking directly at the camera. The background is a soft, out-of-focus grey.

**"Our blood test kit should become
as straightforward a piece of
household equipment as a thermometer.
It gives us security and independence."**

Alexander Tanno
ETH alumnus and young entrepreneur