

ETH Zürich Foundation

Uplift

The impact of giving **N°3**



**Unlocking the power
of duckweed**
The Pioneer Fellows
at LemnaPro

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Leaving a legacy
Donor
Roland von Ballmoos

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ETH Foundation

Support
**Sustainable
nutrition**

**“Feeding the world’s
growing population
sustainably is
one of the big
challenges of our time.
We can only meet
this challenge by
providing intensive support
for the most promising
ideas in the field.”**



Detlef Günther,
ETH Vice President for Research
and Corporate Relations

IMPRINT

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The duckweed challenge

Championing a type of duckweed known as wolffia: two ETH Zurich Pioneer Fellows want to introduce us to a new protein source.

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Wolffia as a smoothie, a salad, a protein powder – what makes this more than just the latest food hype?

CYRILL HESS - Wolffia grows very quickly. Under optimal conditions, it can double in mass in a day. It can also be grown in stacked layers – a practice known as “vertical farming” – and you can eat the entire plant. All of this makes it uniquely resource-efficient. In addition, wolffia has a very high protein content, so it is an excellent alternative source of protein – a nutritional trend in the west with a positive global impact that is likely to be more than just hype. The plant has long been on the menu in Asia, where wolffia is traditionally skimmed from ponds.

Why has no one come up with the idea of producing it on an industrial scale for the European market before now?

MELANIE BINGGELI - As we are well connected with the worldwide duckweed community, including emeriti from various countries, we know that initial attempts were made several

decades ago and that they all failed. The problem lies in plant diseases that can spread to devastating effect in large production facilities.

How is your spin-off LemnaPro in a position to tackle this challenge?

CYRILL HESS - Progress in the world of agritech means that we are in a better position than our predecessors. We are currently in the process of establishing Zurich as a competence centre for duckweed, bringing together researchers from ETH Zurich and ZHAW with a range of expertise who can contribute important pieces of the puzzle and who are enthusiastic about the potential of wolffia.

MELANIE BINGGELI - It’s worth remembering that ETH emeritus Elias Landolt, who sadly died in 2013, was an absolute luminary in the field of duckweed. In his last will, he left his unique collection of living plants to be cared for by his long-term assistant in Zurich. This collection of hundreds of different strains is invaluable to our research. →



He is an environmental scientist, she an agricultural scientist – they became a strong team thanks to Achim Walter, ETH Professor of Crop Science.



Not only a source of essential amino acids, but tasty too: wolffia.

“Industry has recognised the relevance of this field: there’s been a huge amount of interest in our research.”

Melanie Binggeli, Pioneer Fellow, ETH Zurich

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→ *How much does it mean to you that ETH Foundation donors are helping to fund your business idea through the Pioneer Fellowship?*

MELANIE BINGGELI - We’re extremely grateful for this opportunity! It allows us to invest a full year focusing on our vision. And the ETH Innovation and Entrepreneurship Lab (ETH ieLab) is providing outstanding support, with its expertise, network and training.

CYRILL HESS - We’re doing this because we want to make a meaningful contribution to our society. The Pioneer Fellowship allows us to shape our business day by day, and also, to some extent, our world. The fact that other people believe in our vision is a huge motivating force.

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.

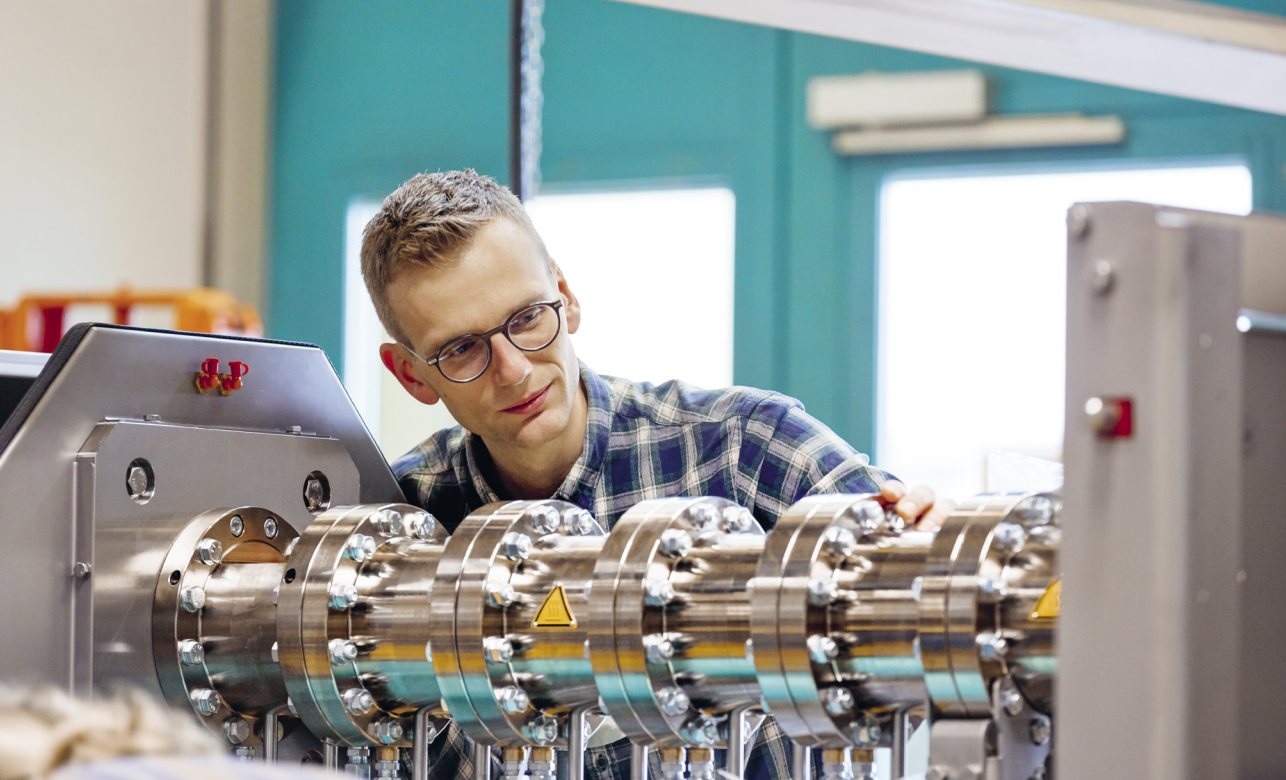


Support Pioneer Fellowships and the Future Food Initiative at www.ethz-foundation.ch/en

Save the world with peas



Chicken made from pea protein is contributing to a more sustainable world: Lukas Böni and his co-founders of the company Planted combine culinary pleasure and cutting-edge food technology.



This new extruder is part of a platform for knowledge building and knowledge transfer developed by Erich Windhab, Professor of Food Process Engineering, as part of a European Institute of Innovation & Technology (EIT) project.

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“Saving the world – one bite at a time.” As the website of ETH spin-off Planted shows, Lukas Böni and his like-minded colleagues are not short of ambition. “After finishing my doctorate at ETH, I was determined to set up something that has a positive impact on the world,” Böni explains. Given his background in food science, he naturally felt that he would be able to make the biggest impact in the food sector. Planted, the company co-founded by Böni, now offers plant-based chicken made from pea protein.

Seed funding jump-starts success

Böni developed the idea for Planted together with his cousin, Pascal Bieri. In 2017, the HSG graduate was working in the US, where there was already a fairly substantial market for meat substitutes. He and Böni immediately saw the potential. They formulated an idea for the manufacture of plant-based meat and presented it to ETH Professor Erich Windhab.

Böni had completed a doctorate on the “fascinating secretion of the hagfish” in Windhab’s Laboratory of Food Process Engineering, and was therefore familiar with soft, fibrous, protein-rich materials that resemble meat. Windhab supported the plan and recommended his doctoral student Eric Stirnemann. Shortly afterwards, Christoph Jenny joined the team, completing Planted’s founding line-up of four.

Böni’s spin-off also received a vital jump-start: thanks to a Pioneer Fellowship financed by ETH and private donors, he and his team had CHF 150,000 at their disposal, plus access to ETH Zurich’s laboratories, equipment and expertise. “It was crucial in helping us make that huge leap from idea to product.” Böni is convinced that Planted would not have reached market as quickly without the Pioneer Fellowship.

“The Pioneer Fellowship was crucial in helping us make that huge leap from idea to product.”

Lukas Böni, co-founder of Planted

Changing consumer attitudes boost market growth

The relevance of Planted can be seen in the latest statistics: meat production is responsible for about 18 percent of global greenhouse gases; other negative effects include over-fertilisation and antibiotic resistance. Not at Planted. “Our product helps conserve natural resources and consists of only four ingredients: pea protein, pea fibre, sunflower oil and water,” Böni explains. The manufacturing process is similar to making pasta: the protein, fibre and oil are kneaded to create a dough and then fed through an extruder under pressure and heat. This creates the chicken-like consistency. The success relies on creating a product that mimics the original as closely as possible. “Our target group is made up of flexitarians – people who like meat but are looking for sustainable and animal-friendly alternatives,” the 30-year-old entrepreneur explains.

Böni is convinced that the food sector is currently experiencing a strong shift towards more ecological and responsible products. Market forecasts suggest he is right. According to Barclays’ Industry Report, the plant-based meat business could expand to USD 140 billion by 2029 and make up ten percent of the global meat market. But how will a small ETH spin-off stand out from the crowd? “Our close ties with ETH allow us to keep pace with ongoing technological advances and use them to improve our plant-based meat,” explains Böni.

Relocating – but not too far from ETH

The strategy seems to be paying off. For its seed financing round in October 2019, Planted raised seven million Swiss francs. 28 Swiss restaurants are already serving pea chicken, and the new online shop has been taking orders every day. The aim of the now eight-strong team is to move into retail at the beginning of 2020. To produce the necessary quantities, Planted needs more space. The company is currently assessing suitable locations that are within easy reach of Zurich by public transport. “We are looking to retain the proximity to ETH and to Zurich, which is an attractive place to live,” says Böni. There’s a good chance that the move will happen very soon.

Planted is slowly spreading its wings; the motivation is still as strong as it was at the outset. Perhaps even stronger. After becoming a father last year, Böni is taking his mission even more seriously: “I don’t just want to create something for myself: I want this to be for my daughter and her generation too,” he explains without hesitation. Ambition: saving the world – one bite at a time.



Support Pioneer Fellowships and the Future Food Initiative at www.ethz-foundation.ch/en
Find out more about Planted at www.planted.ch

For global food and nutrition security

One of the biggest challenges of our time is ensuring worldwide food and nutrition security. How can we guarantee that everyone has access to healthy and sustainable nutrition? ETH Zurich's World Food System Initiative has been finding solutions since 2011.



Already supported by:

Bühler, Coop, fenaco,
Givaudan, Migros, Nestlé,
Stiftung Mercator Schweiz,
Syngenta



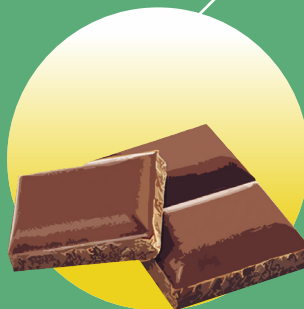
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Thanks to our funding partners, about 45 research projects have already received support. A selection:



Ghana and Ethiopia

Improving the resilience of teff (lovegrass) and cocoa value chains



Latin America

Reducing the accumulation of the heavy metal cadmium in soil for cocoa cultivation



Mozambique

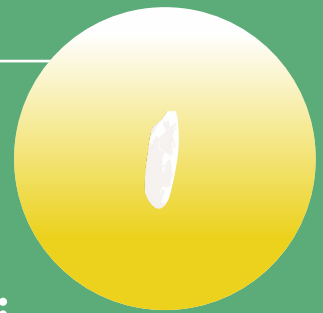
Improving soil quality in organic sweet potato cultivation

**Your
support
provides**

- additional postdoc positions in the field of sustainable nutrition
- a steady flow of new researchers and outstanding specialists for industry



Give now:
www.ethz-foundation.ch/en/world-food



Northern India
Sustainably increasing organic basmati rice production

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Switzerland
Comparison of the effects of drought on key cropping systems



Switzerland
Microalgae as a future source of protein in food



Switzerland
Extending the shelf life of fresh produce

“I’m passionate about ETH!”

Roland von Ballmoos has felt a close bond with ETH ever since the days of his chemistry doctorate. So close, in fact, that he has named the ETH Zurich Foundation in his will.

How would you describe yourself?

ROLAND VON BALLMOOS - I’m someone who enjoys a challenge. When other people say “that’s impossible”, it just makes me all the more determined. My partner sometimes says to me: “Can’t you sit back once in a while?” No, I can’t. When I put my mind to something, I’m there, every inch of the way – who needs sleep? (Laughs) It’s an approach that has proven successful, from my first job at Mobil Oil (now ExxonMobil) to my later career as a consultant.

What memories do you have of ETH?

ROLAND VON BALLMOOS - Earning the degree and the doctorate was very tough. I did nothing but work, work, work, with the odd trip to the mountains to go skiing. I wasn’t the best student. Maths definitely wasn’t my forte. But I enjoyed working in the lab.

You were born in 1952 – why have you decided to write a will now, outlining what is important to you for the future?

ROLAND VON BALLMOOS - I’ve suffered my fair share of personal tragedies, lost people

who were close to me. So at first, I just wanted to turn a blind eye to the whole subject. But my partner kept telling me how important it is to put your effects in order. And, of course, she’s right.

Why are you leaving a legacy to the ETH Zurich Foundation in your will?

ROLAND VON BALLMOOS - Without ETH, I wouldn’t be where I am today. So I knew straight away that I wanted to include the ETH Zurich Foundation in my will. Also, I lived in the US for 15 years and I was impressed by the philanthropic tradition they have of giving something back to your university. I’m passionate about ETH: it’s been at the top of the international rankings for years now – that’s great and I want it to stay that way! Whenever I attend events at ETH – Meet the Talent or Industry Day, for example – I always leave feeling vindicated in my commitment to this university. I hope to inspire others to follow suit. →

“I hope to inspire others with my commitment to ETH Zurich.”

Roland von Ballmoos
ETH Zurich donor





A place he was very familiar with during his time here: the former ETH chemistry building, known as “CAB”. Today, an old laboratory in the listed building (see p.13) serves as a study room for students.

→ You seem to spend a lot of your time travelling – what projects are keeping you so busy?

ROLAND VON BALLMOOS – First, there’s CabinCracks, the start-up I founded in 2017. We have programme managers and software in place to take the way that aircraft cabins are planned and produced to a new level. My USP here is that I developed pneumatic cushions for aircraft with the company Lantal Textiles. These cushions, incidentally, were also used in Bertrand Piccard and André Borschberg’s “Solar Impulse”! Alongside my start-up, I have also a huge passion for skiing and classic cars. I love driving over mountain passes at five in the morning – and sometimes I take part in rallies too!

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

Legacy and appointment as heir

With a legacy, you can bequeath a fixed amount, certain valuables or real estate 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.

New impetus for the nutrition of the future

To provide more support for talent and ideas in the field of sustainable food production and nutrition, ETH Zurich and EPFL, together with their long-standing Swiss industry partners Bühler, Givaudan and Nestlé, have launched the Future Food Initiative.

Image: ETH Zurich / Rainer Spitzberger



Doctoral student Cristina Lupo investigates the health-promoting properties of food components in the Food Biochemistry lab.



Examining crops at ETH Zurich's field phenotyping facility in Lindau-Eschikon.

The world's population is expected to reach 9.7 billion by 2050. That is about 2 billion more than today. How can we feed this growing population while conserving our natural resources? Answers are needed urgently.

The solutions will call for innovation, since the environment and climate are changing, and we will need to adopt pioneering new approaches to the production, processing and consumption of foodstuffs. This is where the Future Food Initiative comes in: the aim is to invest in research in food and nutrition sciences in Switzerland and to intensify the transfer of knowledge from universities to companies. The core of the initiative is a new funding programme for postdocs at ETH Zurich and EPFL, designed to encourage talented individuals from Switzerland and abroad to choose research and innovation in Switzerland.

Excellent research and industrial relevance

The main focus of the initiative is on developing high-quality, healthy and affordable food products that, for example, keep pace with consumer trends, such as the demand for alternative sources of protein, or help to combat malnutrition and famine. Research is also underway to explore new packaging solutions as alternatives to

plastics. The close cooperation between universities and companies means that insights from research benefit society and consumers sooner.

Young researchers who aim to become highly qualified experts in basic research or industry, or who want to start companies, play an important role in this transfer of knowledge. As a result, the Fellowship funding programme is aimed at researchers who have completed their doctorate and understand how to combine academic excellence with industrial relevance. Applicants whose projects are selected receive financial support for three years. The programme will award up to 10 fellowships a year; in other words, about 50 over a five-year period. The ETH Foundation is looking for additional private donors, foundations and industry partners that would like to support talented individuals in the field of future food.



Support the Future Food Initiative at www.ethz-foundation.ch/en/world-food

World Food System Center

At ETH Zurich, the Future Food Initiative is managed by the World Food System Center. This interdisciplinary competence centre has been seeking local and global collaborative partnerships since 2011. Collaboration is key, as sustainable solutions are needed along the entire value chain. New technologies can only flourish if they deliver significant societal benefits and are accepted by consumers.



Find out more at www.worldfoodsystem.ethz.ch

**“A healthy diet for
all is possible.
But there is no one-size-
fits-all solution
when it comes to global
food and nutrition security
over the long term.
We need to explore
countless possibilities if we
are to find stable
solutions for the
world food system.”**

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Nina Buchmann,
Professor of Grassland Sciences
at the Institute of Agricultural Sciences,
ETH Zurich



THANK YOU!

At ETH Week 2015: "The Story of Food"

Your contribution to our future

Science and technological innovation are more important today than ever. We need answers to global 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!



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



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Donate by credit card, PostFinance, PayPal or TWINT:
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For donations in euros or US dollars:
www.ethz-foundation.ch/en/bank-details



Personal support

There are lots of ways in which 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!

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“Our plant-based chicken is a sustainable and tasty response to the protein needs of the future.”

Lukas Böni
ETH alumnus, co-founder of Planted