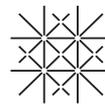




University of  
Zurich<sup>UZH</sup>

**ETH** zürich



University  
of Basel

# PlantScience*News*

Newsletter of the Zurich-Basel Plant Science Center

No 34, Fall 2018

## Upcoming Events

**Urban Agriculture – Fad or Future?  
Public Round Table**

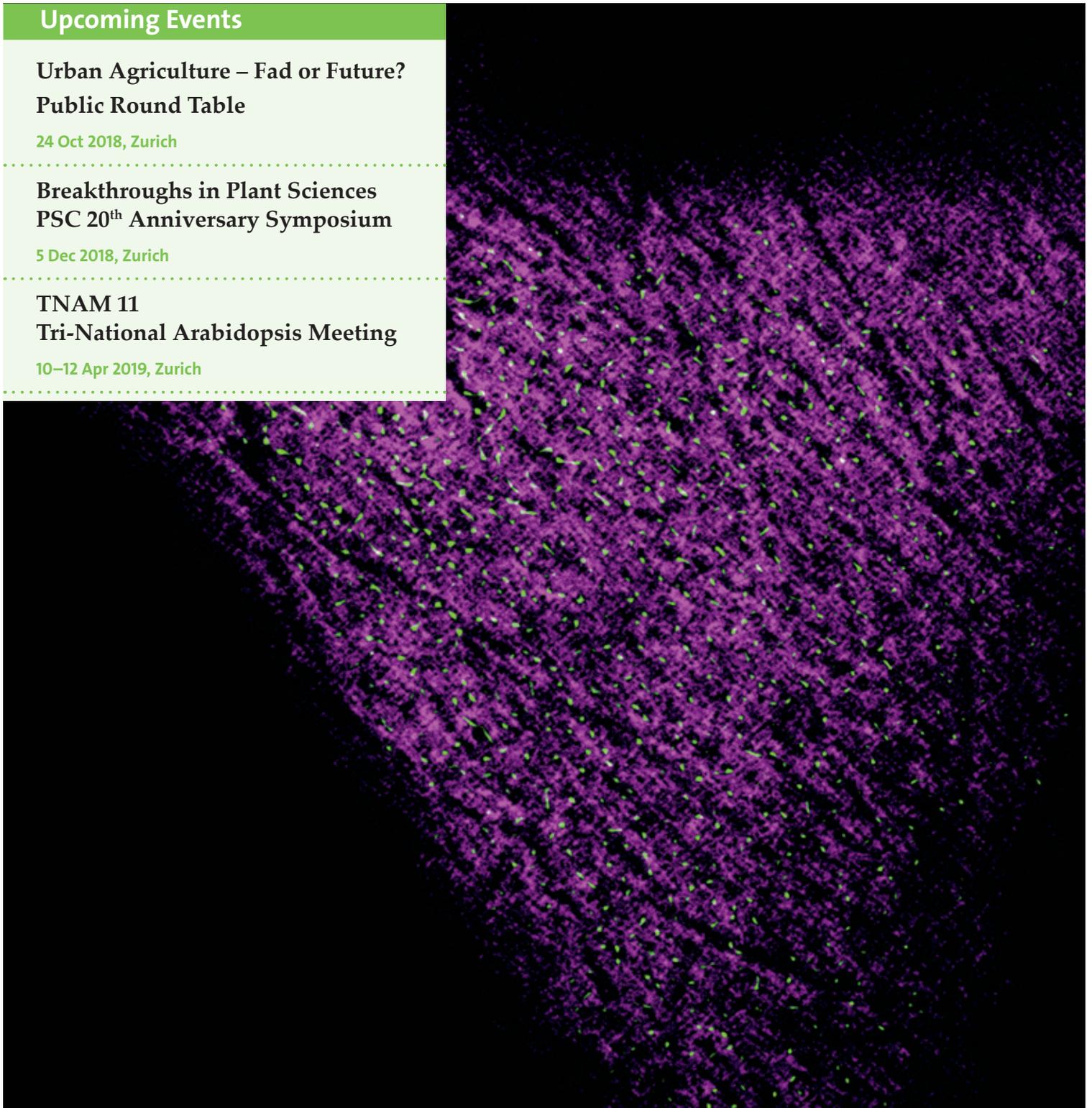
24 Oct 2018, Zurich

**Breakthroughs in Plant Sciences  
PSC 20<sup>th</sup> Anniversary Symposium**

5 Dec 2018, Zurich

**TNAM 11  
Tri-National Arabidopsis Meeting**

10–12 Apr 2019, Zurich



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Dual-color super-resolution radial fluctuation (SRRF) microscopy image of plasma membrane nanodomain localization of receptor kinases expressed in *N.benthamiana* (top view of the cell plasma membrane). © Julien Gronnier, University of Zurich.

# Editorial

## 20 years PSC – plant research for the future

The PSC is celebrating its 20<sup>th</sup> anniversary. Truly a success story, the PSC has given plant sciences a voice within, and for Switzerland. The first decade was mainly spent developing a forefront education program for our students and sparking numerous interdisciplinary research collaborations that emphasized the cutting-edge plant science research in the Zurich-Basel area. The second decade has seen these programs and collaborations cemented, and complemented with targeted outreach projects. The PSC pioneered with its specialized PhD training program “Science and Policy” and since then has supported more than 30 transdisciplinary research projects, bringing research results into national and international policy and decision-making channels.

At the heart of the PSC is fundamental plant science research – from molecules to landscapes – striving for a deeper understanding of the nature of plants, their biological processes and ecosystem interactions. With this knowledge come opportunities to address global challenges facing our societies. In the last few years, the PSC has coordinated three major EU-funded projects, hosting more than 70 doctoral and postdoctoral fellows, two of whom present highlights of their work in this newsletter.

During the life of the PSC we have witnessed many technological developments, such as metabolic profiling, proteomics, next generation sequencing, super-resolution microscopy, and biotechnological breakthroughs like CRISPR/Cas9. These new avenues allow us to continuously push the boundaries of our research and offer us larger systemic insights into the world of plants and their environments. We are now entering an exciting digital age – also in plant sciences – yet, truth be told, we still lack knowledge on the specific function of the vast majority of genes in any genome. There remains much to do across the scope and scales of plant sciences and its application in agricultural, environmental and health arenas. We are proud that the PSC and its members will be at the forefront of it.

We will celebrate the PSC’s 20<sup>th</sup> anniversary with a dedicated symposium on December 5<sup>th</sup> at ETH Zurich. The program entitled: “Breakthroughs in Plant Sciences – from the laboratory to the world” promises a vibrant event with excellent speakers.

I look forward seeing you there. [www.psc2018.ethz.ch](http://www.psc2018.ethz.ch)

Sincerely,  
Samuel C. Zeeman, PSC chair

Office door of the newly rebuilt Institute of Botany at the University of Basel © PSC



# New plant breeding technique for cassava improvement

Simon E. Bull

Crop research is undergoing a renaissance helped by the emergence of the Cas9-mediated genome editing technology. From 2014 to 2016, I took part in the PLANT FELLOWS post-doctoral scheme coordinated by the Zurich-Basel Plant Science Centre. Working in the Plant Biotechnology Group at ETH Zurich, my primary aim was to develop a genome editing system for improving cassava (*Manihot esculenta* Crantz). Despite its provenance amongst the staple crops, cassava improvement has been hampered by a highly heterozygous genome, variable flowering and poor seed production<sup>1</sup>. Given the complexity of cassava modification and available genetic maps, we chose to target genes involved in starch biosynthesis, considering that successful editing should give plants with a defined and useful trait.

We introduced the Cas9 genome editing tool via stable, genetic transformation to modify *GRANULE BOUND STARCH SYNTHASE (GBSS)* and the recently reported *PROTEIN TARGETING TO STARCH (PTST)*<sup>2</sup>. These genes are involved in the biosynthesis of amylose, a component of the starch granule. The Cas9 scissors successfully snipped the *GBSS* and *PTST* genes, which were repaired naturally by the plant. However, the repair mechanism is imperfect and leaves a mark, which may alter gene function in a beneficial way. These marks, or indels (insertions and/or deletions of nucleotides), in the plantlets were identified using next-generation sequencing. After a few months of growth in the glasshouse, the plants produced storage roots. In collaboration with the Plant Biochemistry Group (ETH Zurich) we performed biochemical analysis of the starch. We were particularly interested in the amylose content and revealed a suite of *GBSS*-edited plants that contained different amounts of amylose – from normal quantities to amylose-free (or “waxy”) starch (Fig. 1 A, B).

Cassava seldom flowers in the glasshouse. However, to remove the Cas9 transgene via segregation we would need to self-pollinate the flowers. To achieve this, the *FLOWERING LOCUS T (FT)* gene from *Arabidopsis* was also introduced<sup>3</sup>. The expression of this transgene successfully triggered blooming (Fig. 1 C), allowing us to manually pollinate flowers for seed production. All the emerging seedlings had inherited the modified *GBSS* gene, and some also lacked the introduced DNA cassette. Thus, we produced plants that carried the modified gene and the desired trait, but lacked the genes for Cas9 and FT.

This combined genome editing and accelerated flowering technique could assist breeders in the Global South to rapidly produce plants with specific traits, either directly in their farmer-preferred cultivars, or through introgression by crossing (Fig. 1 D). This approach is particularly effective when desired traits result from recessive mutations, which are particularly difficult to generate, identify and breed in cassava using conventional methods.

We are now looking to strengthen knowledge transfer partnerships and capacity building programs with collaborators in the Global South (H. Vanderschuren, pers. comm.). The aim is to empower local researchers, breeders and farmers to improve cassava cultivation for their specific needs, and to integrate new technology with existing local research ventures, education and socioeconomic programs<sup>4</sup>.

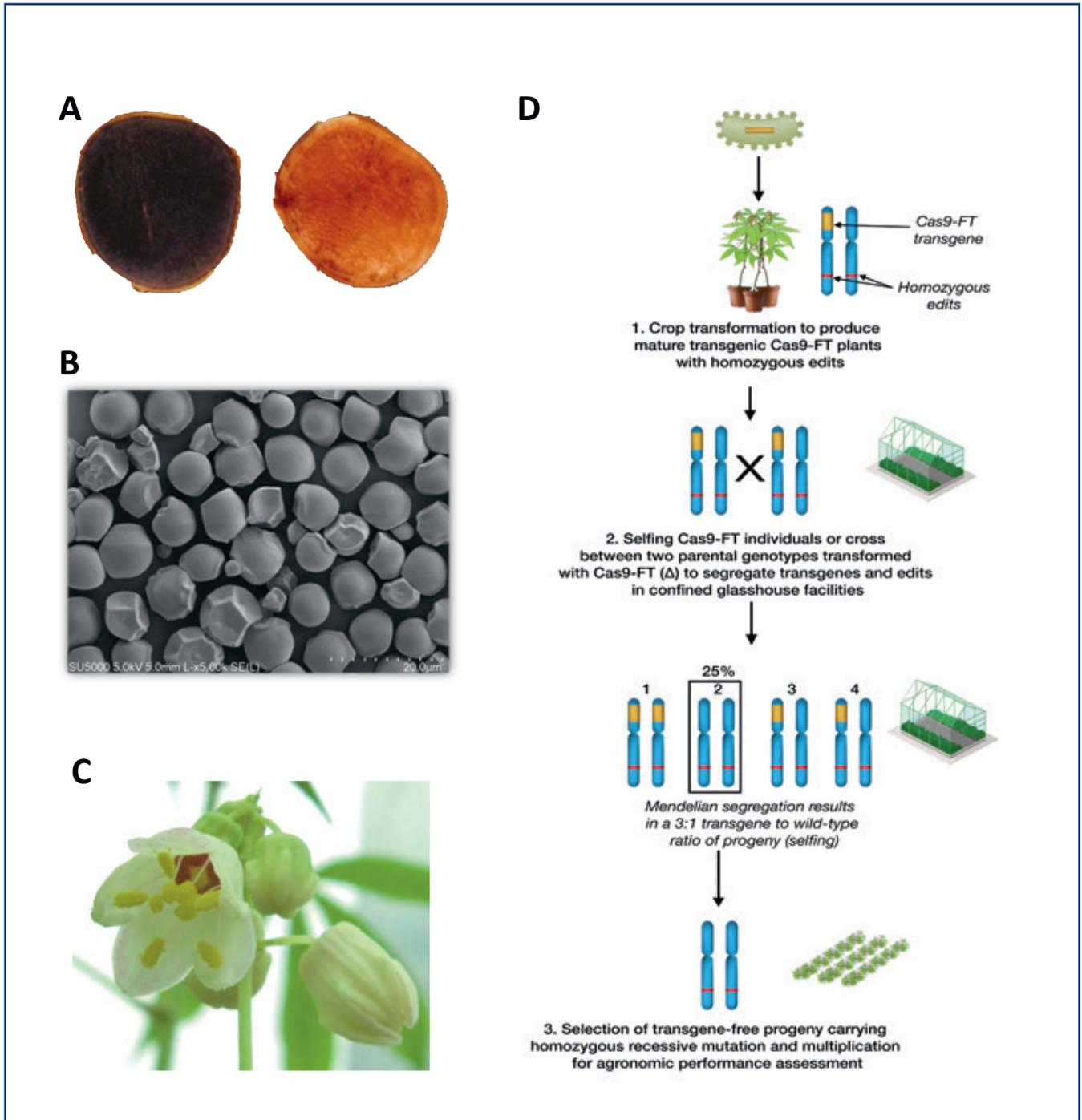
Use of this new plant breeding technique would require clear, national policies regarding regulation of breeding with genome edited plants. The European Court of Justice recently reported that genome edited plants should be regulated as other transgenic material<sup>5</sup>. In contrast, the U.S. Department of Agriculture stated that genome edited crops that lack foreign DNA should be regulated as non-transgenic<sup>6</sup>. Evidently, there are many discussions to be had regarding national policies and international agreements on this subject. While the discussions continue, so does the urgent need to improve global agricultural for future generations.

The results discussed in this article were published in *Science Advances*<sup>7</sup>.

## References

- <sup>1</sup> R. Howeler, et al. (2013). Save and Grow: Cassava. A guide to sustainable production intensification (FAO, Rome).
- <sup>2</sup> D. Seung, et al. (2015). PROTEIN TARGETING TO STARCH is required for localising GRANULE-BOUND STARCH SYNTHASE to starch granules and for normal amylose synthesis in *Arabidopsis*. *PLOS Biology*: 13, e1002080.
- <sup>3</sup> S. E. Bull, et al. (2017). *FLOWERING LOCUS T* triggers early and fertile flowering in glasshouse cassava (*Manihot esculenta* Crantz). *Plants*: 6, E22.
- <sup>4</sup> H. Vanderschuren (2012). Strengthening African R&D through effective transfer of tropical crop biotech to African institutions. *Nature Biotechnology*: 30 (12), 1170–1172.
- <sup>5</sup> Court of Justice of the European Union. Judgment in Case C-528/16. Luxembourg, 25 July 2018.
- <sup>6</sup> U.S. Department of Agriculture. (2018). [www.usda.gov/media/press-releases/2018/03/28/secretary-perdue-issues-usda-statement-plant-breeding-innovation](http://www.usda.gov/media/press-releases/2018/03/28/secretary-perdue-issues-usda-statement-plant-breeding-innovation)
- <sup>7</sup> S. E. Bull, et al. (2018). Accelerated ex situ breeding of *GBSS*- and *PTST1*-edited cassava for modified starch. *Science Advances*: 4, eaat6086.

Contact: [sbull@ethz.ch](mailto:sbull@ethz.ch)



**Figure 1:** Iodine stained cassava storage roots from glasshouse-cultivated plants. Wild-type (left) and amylose-free, *gbs* mutant (right) (A). Purified starch granules viewed using a scanning electron microscope (B). Inflorescence on a *GBSS*-edited plant cultivated in a glasshouse (C). New plant breeding technique for accelerated flowering and segregation of genome edited lines. Δ Avoiding selfing should limit potential inbreeding depression (D). Please refer to publication for full details. © Simon E. Bull



This project received funding from the European Union's 7<sup>th</sup> Framework Programme for research, technological development and demonstration under grant agreement no GA-2010-267243 – PLANT FELLOWS.

[www.plantfellows.org](http://www.plantfellows.org)

## At a Glance

### Awards

- As of 1 January 2018 **Anne Roulin** has been appointed assistant professor for evolutionary genomics of plants at the University of Zurich (Department of Plant and Microbial Biology).
- As of 1 August 2018, **Marcel van der Heijden** has been appointed professor for agroecology and plant-microbe-interactions at the University of Zurich.
- **Cyril Zipfel**, new professor at the University of Zurich, received an ERC Consolidator grant (Regulation of plant receptor kinase – mediated immunity by endogenous peptides and their receptors). He also received the prestigious Tsuneko & Reiji Okazaki Award from Nagoya University, Japan, in recognition of his contributions to life science research, especially with regard to the understanding of the molecular basis of plant innate immunity.
- **Denise Binggeli** (University of Basel) was awarded the Pro Montes prize 2018 of the Swiss Foundation for Alpine Research for her Master thesis on the Successful recultivation of the abandoned terraced landscape of the Tessin Alps (Bruno Baur group).
- This year's Phil. Alp award for the best Master's thesis went to **Markus Staudinger** (ETH Zurich) for his work on browsing damage of *Alnus viridis* by livestock (Nina Buchmann group).

### Open call

#### PSC Syngenta Fellowship Program

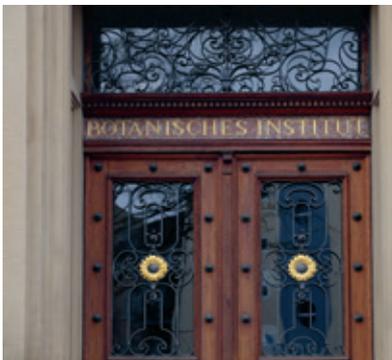
Applications for PhD and postdoc fellowships can be submitted by 1<sup>st</sup> of November 2018. The funds are intended to promote innovative research in plant sciences. Research co-operation within PSC will be an important criterion in the project selection. This call is reserved for PSC professors and group leaders.

For application templates contact:

Manuela Dahinden  
mdahinden@ethz.ch

or visit

[www.plantsciences.ch/research/fellowships/syngenta.html](http://www.plantsciences.ch/research/fellowships/syngenta.html)

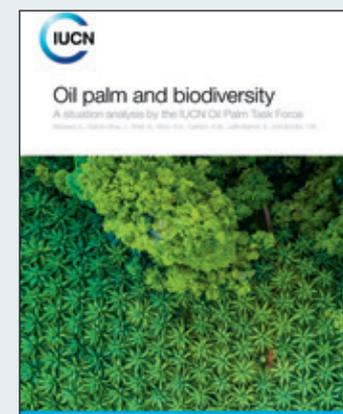


## Reopening of the Institute of Botany at the University of Basel

After more than one year of construction the Institute of Botany at the University of Basel re-opened in spring 2018. While the building has kept its familiar turn-of-the-century look, it was completely renovated and equipped with the latest scientific infrastructure.

On May 30<sup>th</sup> the official reopening of the institute was celebrated with a stimulating event. More than 400 guests were welcomed in the university's main auditorium by the university president Prof. Andrea Schenker-Wicki and other university authorities. Prof. Bernhard Schmid, who started his career in Basel, gave a keynote lecture in which he stressed the pertinent role of plant sciences in contributing to solutions for current challenges such as sustainable food security and to providing profound understanding of ecosystem functioning. He also highlighted important innovations in plant sciences that emerged in Basel and spread the globe over the past decades. After the official part of the celebration, visitors enjoyed an apero in the Botanical Garden and had a chance to visit the new facilities in the institute. They learned about current lab techniques and research projects, enjoyed an exhibition about the Herbaria Basel, and chatted with doctoral and postdoctoral fellows. Many alumni and former staff members were among the visitors.

### Publications



Meijaard E, Garcia-Ulloa J, Sheil D, Wich SA, Carlson KM, Juffe-Bignoli D, Brooks TM (eds.) (2018).

**Oil palm and biodiversity. A situation analysis by the IUCN Oil Palm Task Force.**

IUCN Oil Palm Task Force Gland, Switzerland: IUCN.  
978-2-8317-1910-8 (PDF)  
978-2-8317-1911-5 (print version)

# Strong impacts of biodiversity in a large-scale subtropical forest experiment

*This PhD project was supported by a PSC PhD fellowship within the Innovative Doctoral Program IDP BRIDGES, a Marie Curie Action of the European Union (No. 608422). It was conducted under the supervision of Bernhard Schmid, Keping Ma and Pascal A. Niklaus.*



Tree plots in site A in Sep 2015  
© Yuanyuan Huang

**Yuanyuan Huang**

Forests cover approximately 30% of the world's land surface, exposing a large ecosystem volume with vertical structure from deep in the soil with the extended root system to high up in the canopy with woods and crowns. Diverse tree species in forests absorb carbon dioxide and store carbon while releasing oxygen into the air. Forests contribute ca. 50% of terrestrial net primary production and are important in regulating climate, providing food, timber, energy and other ecosystem services. Forests harbor around two thirds of all terrestrial plant species. However, over the last two decades, humans have changed ecosystems rapidly and extensively, causing a huge decline in forest biodiversity. Research in grassland and microbial ecosystems identified a positive relationship between biodiversity and ecosystem functioning (BEF). In contrast, experimental evidence and knowledge about the underlying mechanisms for BEF relationships in structured and highly diverse forests is still lacking, especially when considering the large temporal and spatial scale.

To fill this gap, we studied the effects of species richness effects on primary productivity at the platform of a large manipulative forest experiment (BEF-China, <http://www.bef-china.de>) in Xingangshan (Jiangxi province) in south-eastern China, which was set up in 2009. It comprises an area of ca. 40 ha in a hilly area, where a total of 226'400 trees from 40 species were planted together with shrubs from 20 species. The experimental design features six levels of tree species richness (1, 2, 4, 8, 16 and 24 species) which are partially factorially crossed with four levels of shrub species richness (0, 2, 4, 8 species). I assessed stand-level tree productivity through monitoring tree sizes in all 566 plots in Sep./Oct. from 2013 to 2016. Using long-term inventory data, we explored effects of different diversity dimensions (e.g., species richness and functional and phylogenetic diversity) on forest productivity with mixed-effect models. We found strong positive biodiversity effects on productivity, and the effects strengthened over time. After eight years, 16-species mixtures had accumulated over twice the amount of carbon found in average monocultures. Interestingly, a shrub addition treatment reduced tree productivity, but this reduction was smaller at high shrub species richness. We further conducted a field experiment to explore effects of species interactions between trophic levels (plant-insects and plant-pathogens) on BEF relationships and found that in subtropical forests complementarity in enemy niches, especially for leaf pathogens, enhances diversity effects at the community level.

This is a timely finding given extensive afforestation efforts that are now underway not only in China, but also worldwide. In fact, the area of globally planted subtropical forests increased by 165% from 151 M ha to 399 M ha between 1990 and 2015. Finding smarter ways to plant forests will tremendously benefit society. Our results highlight the potential of establishing mixed-species stands that simultaneously mitigate climate change and enhance biodiversity restoration.

## Publications

Huang Y, et al. (2017)

**Positive effects of tree species diversity on litterfall quantity and quality along a secondary successional chronosequence in a subtropical forest.**

*Journal of Plant Ecology*: 10, 28–35.

Huang Y, et al. (2018)

**Impacts of Species Richness on Productivity in a Large-Scale Subtropical Forest Experiment.**

*Science*: in press.

Liu X, Trogisch S, He JS, Niklaus PA, Bruehlheide H, Tang Z, Erfmeier A, Scherer-Lorenzen M, Pietsch KA, Yang B, Kühn P, Scholten T, Huang Y, Wang C, Staab M, Leppert KN, Wirth C, Schmid B, Ma K. (2018)

**Tree species richness increases ecosystem carbon storage in subtropical forests.**

*Proceedings of the Royal Society B: Biological Sciences*: 285.

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## Professor Yvonne Willi, University of Basel



© Uni Basel / Giulia Marthaler

The observation that species have restricted distributions has intrigued ecologists and evolutionary biologists for a long time. Why is it that species – particularly plants – have distinct distribution limits in latitude or elevation? Climate is often important, but the more ultimate and mechanistic causes underlying climate limits to geographic ranges are largely unknown. We apply an evolutionary framework to discover why the evolution of the climate niche is constrained. We model changes in the environment at range edges, and perform common garden and selection experiments by manipulating climate. We use genomic

association studies to find the genes and traits involved in climate adaptation, and population genomic analyses to understand past range dynamics and relate them to mutational load. One of our study organisms is *Arabidopsis lyrata*, a close relative of the model species *A. thaliana*. In contrast to this very well studied species, *A. lyrata* has an outcrossing mating system – which is the predominant reproductive mode in plants – and a well-characterized distribution in eastern North America. We also study >100 species of Brassicaceae that occur in Switzerland with very distinct elevational distributions; some species are restricted to the lowlands while others live in alpine areas. Results are of fundamental importance for understanding why we have high species turnover over large geographic areas – a main contributor to global biodiversity – and for predicting limits to climate niche adaptation in wild and cultivated plants.

### Curriculum vitae

Yvonne Willi is Professor of Plant Ecology and Evolution at the Univer-

sity of Basel. She received her PhD from the University of Zurich with Markus Fischer in 2005. Her PhD was motivated by the question whether the conservation of small populations will be effective in the long term, and focused on relating long-term population size with evolutionary potential in ecologically relevant traits and the accumulation of mutational load. Yvonne Willi received a 1.5y postdoctoral fellowship from the Swiss National Science Foundation to follow up this work in the group of Ary Hoffmann at the University of Melbourne. She was then hired as lecturer (Oberassistentin) in the lab of Bruce McDonald at ETH Zurich. In 2009 she was awarded a 6y professorial fellowship by the Swiss National Science Foundation, hosted at Neuchâtel University, and moved to Basel in 2015. Yvonne Willi has 2 children of 3 and 4y of age.

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Experimental set-up in ClimeCab chambers © Alessio Maccagni



Nature Genetics (2018)

doi: 10.1038/s41588-017-0012-9

**Genomic features of bacterial adaptation to plants**Levy A, Gonzalez IS, Mittelviehhaus M, ..., Vorholt JA, et al.

Plants intimately associate with diverse bacteria. Plant-associated bacteria have ostensibly evolved genes that enable them to adapt to plant environments. However, the identities of such genes are mostly unknown, and their functions are poorly characterized. We sequenced 484 genomes of bacterial isolates from roots of Brassicaceae, poplar, and maize. We then compared 3,837 bacterial genomes to identify thousands of plant-associated gene clusters. Genomes of plant-associated bacteria encode more carbohydrate metabolism functions and fewer mobile elements than related non-plant-associated genomes do. We experimentally validated candidates from two sets of plant-associated genes: one involved in plant colonization, and the other serving in microbe-microbe competition between plant-associated bacteria. We also identified 64 plant-associated protein domains that potentially mimic plant domains; some are shared with plant-associated fungi and oomycetes. This work expands the genome-based understanding of plant-microbe interactions and provides potential leads for efficient and sustainable agriculture through microbiome engineering.

Nature Reviews Microbiology (2018)

doi: 10.1038/s41579-018-0024-1

**Keystone taxa as drivers of microbiome structure and functioning**Banerjee S, Schlaeppi K, van der Heijden M

Microorganisms have a pivotal role in the functioning of ecosystems. Recent studies have shown that microbial communities harbour keystone taxa, which drive community composition and function irrespective of their abundance. In this Opinion article, we propose a definition of keystone taxa in microbial ecology and summarize over 200 microbial keystone taxa that have

been identified in soil, plant and marine ecosystems, as well as in the human microbiome. We explore the importance of keystone taxa and keystone guilds for microbiome structure and functioning and discuss the factors that determine their distribution and activities.

Trends in Ecology &amp; Evolution (2018)

doi: 10.1016/j.tree.2018.03.005

**Games as tools to address conservation conflicts**Redpath SM, Keane A, Andren H, ...  
Garcia CA, et al.

Conservation conflicts represent complex multilayered problems that are challenging to study. We explore the utility of theoretical, experimental, and constructivist approaches to games to help to understand and manage these challenges. We show how these approaches can help to develop theory, understand patterns in conflict, and highlight potentially effective management solutions. The choice of approach should be guided by the research question and by whether the focus is on testing hypotheses, predicting behaviour, or engaging stakeholders. Games provide an exciting opportunity to help to unravel the complexity in conflicts, while researchers need an awareness of the limitations and ethical constraints involved. Given the opportunities, this field will benefit from greater investment and development.

Molecular Biology &amp; Evolution (2018)

doi: 10.1093/molbev/msy003

**Accumulation of mutational load at the edges of a species range**Willi Y, Fracassetti M, Zoller S, Van Buskirk J

Why species have geographically restricted distributions is an unresolved question in ecology and evolutionary biology. Here, we test a new explanation that mutation accumulation due to small population size or a history of range expansion can contribute to restricting distributions by reducing population growth rate at the edge. We examined genomic diversity and mutational load across the entire geographic range of the North American plant *Arabidopsis lyrata*,

including old, isolated populations predominantly at the southern edge and regions of postglacial range expansion at the northern and southern edges. Genomic diversity in intergenic regions declined toward distribution edges and signatures of mutational load in exon regions increased. Genomic signatures of mutational load were highly linked to phenotypically expressed load, measured as reduced performance of individual plants and lower estimated rate of population growth. The geographic pattern of load and the connection between load and population growth demonstrate that mutation accumulation reduces fitness at the edge and helps restrict species' distributions.

Nature Communications (2018)

doi: 10.1038/s41467-018-03792-x

**Crab spiders impact floral-signal evolution indirectly through removal of florivores**Knauer AC, Bakhtiari M, Schiestl FP

Nature Communications (2018)

doi: 10.1038/s41467-018-03937-y

**Methanol-essential growth of *Escherichia coli***Meyer F, Keller P, Hartl J, Groninger OG, Kiefer P, Vorholt JA

Genome Biology (2018)

doi: 10.1186/s13059-017-1383-z

**Extensive epigenetic reprogramming during the life cycle of *Marchantia polymorpha***Schmid MW, Giraldo-Fonseca A, Rovekamp M, Smetanin D, Bowman JL, Grossniklaus U

Nature Sustainability (2018)

doi: 10.1038/s41893-018-0062-8

**Climate-smart sustainable agriculture in low-to-intermediate shade agroforests.**Blaser WJ, Oppong J, Hart SP, Landolt J, Yeboah E, Six J

## Welcome Event

for new PSC students at ETH Zurich, University of Zurich and University of Basel

1 Oct 2018, ETH Zurich, ML E 13  
12:00–13:30

Start the new term with networking. Join us for a brief information session on the PSC training programs and mentoring services. Organizational FAQ for graduate students, followed by a student apéro.

## PSC Course Series: Frontiers in Plant Sciences

### RNA Sequencing – A Practical Course for Plant Scientists

Lucy Poveda, Weihong Qi, and others at Functional Genomics Center Zurich, Irchel Campus, University of Zurich

2–5 Oct 2018

### Introduction to Genome-Wide Association Studies (GWAS)

Matthew Horton (IPMB) and Ümit Seren (GMI, Vienna) at The Villa at the Botanical Garden, University Zurich

22 & 23 Nov 2018

#### Contact

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## Plant scientists trained to close the science-policy gap

A summary of the PSC doctoral program "IDP BRIDGES" (FP7-PEOPLE, GA No. 608422) is available on the CORDIS website.

[https://cordis.europa.eu/result/rcn/223808\\_en.html](https://cordis.europa.eu/result/rcn/223808_en.html)

## Special Lecture

### High-impact science communication in the 21<sup>st</sup> century – a Cell Press perspective

6 Dec 2018, ETH Zurich, LEE E 101, 9:15–11:00

Lecturer: Susanne Brink

We live in a rapidly changing (science publishing) world with exponential growth of data and increasing challenges, such as keeping up with the scientific literature and getting published in the first place. Another challenge for early career academics is to identify all long-term career options, such as working as scientific editor. Susanne Brink, the editor of *Trend in Plant Sciences* and *Cell Press* will address these challenges by sharing her insights as an editor on 1) how to get published in top tier journals and 2) what it takes to become a scientific editor.

## PSC PhD Courses

### Next-Generation Sequencing 2: Continuation Course: Transcriptomes, Variant Calling, and Biological Interpretation

17–18 Sep 2018

### Colloquium "Challenges in Plant Sciences"

24 Sep & 29 Oct 2018

### Sustainable Plant Systems

22 Oct–3 Dec 2018

### Genetic Diversity: Techniques

31 Oct–21 Nov 2018

### Scientific Writing Practice 1

31 Oct & 21 Nov 2018

### Writing a Post-Doctoral Grant

5 & 6 Nov 2018

### Introduction to R

12 & 13 Nov 2018

### Current Challenges in Plant Breeding

23 Nov 2018 & 1 Feb 2019

### Scientific Visualisations using R

28 & 29 Jan 2019

## SCIENCE & POLICY

### Challenges of Interdisciplinarity and Stakeholder Engagement

3 Oct–12 Dec 2018

### Communicating Science

22 Oct & 19 Nov 2018

### Building Political Support

7 Nov & 12 Dec 2018

#### Registration & updated course list

<https://spsw.registration.ethz.ch>

# Make innovation happen

## feminno

### Career program for innovative women in Life Sciences

Ute Budliger

The first round of the *feminno* career program closed on July 9<sup>th</sup> with final presentations and a recap of the program. The 11 selected PhD students and postdoc fellows presented their innovation 'ecosystems' with great enthusiasm to the steering committee. Three groups envisioned how to move forward with their projects in the future; for example one group is interested in founding a start-up on plastic waste reduction.

The combination of the topics (career development, innovation and gender diversity) together with panel discussions and company visits, provide a solid base for the participants' imminent career decisions. Dr. Ute Budliger, the program coordinator, noted that prior to engaging in the *feminno* career program, hardly any participant envisioned working on innovative ideas. However, during its course they developed an appetite and the skills to do so.

A second round of the *feminno* career program will start in October 2018 with a slightly adapted agenda. The development of innovation projects will be emphasized since guidance during the phase of idea creation is key to elevating projects to the next level.

Eventually, the *feminno* program partners will produce **guidance on innovation processes for female academics**. This document will incorporate a Delphi-study to include internal and external input on the facilitation of innovation.

#### Enrolment

The program addresses female researchers from the Life Sciences currently working as a PhD student, postdoc, or group leader at the University of Zurich, ETH Zurich, or University of Basel.

[www.plantsciences.uzh.ch/en/mentoring.html](http://www.plantsciences.uzh.ch/en/mentoring.html)

#### Contact

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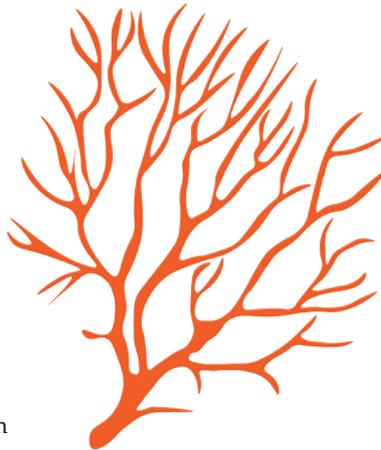
*The program is coordinated by the Zurich-Basel Plant Science Center and supported by the Swiss Federal Office for Gender Equality for the period 2017–2019.*

#### Project partners

Life Science Zurich – University of Zurich and ETH Zurich

Office for Gender Equality – University of Zurich and University Basel

Career Services – University of Zurich



### Upcoming Events

#### FOR PARTICIPANTS

##### Career Retreat

22–24 Oct 2018

##### Company visit Actelion

1 Nov 2018

##### Innovation Workshop

19–20 Nov 2018

#### OPEN EVENT

##### Lunch Talk: What I need to know when applying for a job in the industry

3 Dec 2018

*Registration tba.*

« *The feminno program is a wonderful opportunity to join a group of selected scientists with great experience and challenging ideas. It is an intensive, broad and rich program that brings to discussion current and important topics, aiming to develop skills necessary to all entrepreneurs. Moreover, the group composition being female creates a unique atmosphere, empathic and supportive. I strongly recommend the feminno program to all women that have already decided their professional pathway, or are searching for new professional opportunities.* »

Tais Adelita (former participant)

Follow feminno on LinkedIn

## Public Round Table

**Urban Agriculture***Fad or Future: Should tomorrow's cities grow their own food?*

© Shutterstock

**24 Oct 2018****ETH Zurich, Auditorium Maximum HG F30, Rämistr. 101  
17:15 – 19:00**

Urban agriculture (UA), or the production of food intended for local consumption within urban areas, has seen a revitalization in recent decades, as calls for innovative solutions to both global and specifically urban sustainability problems grow louder. Advocates for the development of UA believe that it is a major step towards increasing a city's food security and social well-being, while decreasing its carbon emissions and increasing sustainability. However, these stances are not universally accepted and many unanswered questions remain. In this Public Round Table selected experts will discuss UA's successes and failures as well as its future opportunities and challenges. This event is organized by PSC-Mercator doctoral students.

**Website and registration**

[www.plantsciences.uzh.ch/en/outreach/roundtable.html](http://www.plantsciences.uzh.ch/en/outreach/roundtable.html)

**Invited speakers**

**Joëlle Salomon Cavin**  
University of Lausanne

**Giorgio Gianquinto**  
University of Bologna

**Heidrun Moschitz**  
Research Institute of Organic Farming

**Fabian Weinlaender**  
Entrepreneur

**Organizers**

Tiago Meier, University of Zurich  
Sergei Schaub, ETH Zurich  
Kevin Vega, ETH Zurich  
Eva Maria Vorkauf, University of Basel

**Supported by**

Zurich-Basel Plant Science Center  
Mercator Stiftung Schweiz

## Climate Garden 2085 exhibition moves on

### Rio de Janeiro, Brazil (Jan–Apr 2019)

Organized by the Museum of Tomorrow in cooperation with Dr. Daniela Fernandez (Et. Al. Communications) an expert in public health. The Museum of Tomorrow is the largest science museum in Brazil counting up to 2000–3000 visitors a day. The garden will be part of the school programs of the museum connecting science to its social, cultural and environmental context.

<https://museudoamanha.org.br>

### Lugano, Switzerland (Jan–Apr 2019)

Organized by the Franklin University (Professor Caroline Widmer) in cooperation with the city of Lugano and WSL Ticino (Dr. Marco Conedera), the garden will be integrated into the Bachelors level course “Sustainability and social justice”. Students will organize public events and take care of the greenhouse and garden.

### Lausanne, Switzerland (May–Aug 2019)

Organized by the ArtLab EPFL (Professor Sarah Kenderdine) the garden will be set up by the architecture department and students will organize public events. The exhibit will include climate measuring systems from their own research labs. The Department of Experimental Museology EM+ will install real-time data streaming from the garden into the ArtLab space. In 2019 EPFL will celebrate its 50<sup>th</sup> anniversary and it will look into the future of its campus.

### Winterthur, Switzerland (Apr–Jun 2019)

Co-organized by the city of Winterthur and myblueplanet (Daniel Lüscher), a climate change NGO. The garden will focus on the urban planning geared towards adaptation and mitigation of climate change. The NGOs’ technical apprentices will be involved in the construction and installation.

### Edinburgh, Scotland (2020)

In 2020 the Royal Botanic Garden Edinburgh will celebrate its 350<sup>th</sup> anniversary. The festivities will include a look into the future and the *Climate Garden* will be part of it. Organized by Ian Edwards, head of exhibitions and events.

## @Olma 2018

Preparations are in full swing for the OLMA Agricultural Fair on 11–21 of October. The PSC coordinates the exhibition activities together with many different ETH research groups from D-USYS, D-HEST and the World Food System Center.

With the goal of bringing research closer to the farming community we have created an exhibit with activities for adults, teens and young children. The heart of the exhibit is the Lab, where we have a program of short workshops and demonstrations. Samuel C. Zeeman’s group is developing a starch in grains demo, and Laura Nystrom’s group will demonstrate the properties of soluble fibres in grains. The Virtual Reality film from Grassland Science Group of Nina Buchmann is sure to be a big hit, as will the stomata experiments from Forage Crop Genetics group of Bruno Studer. Thanks to all who are participating!

### Contact

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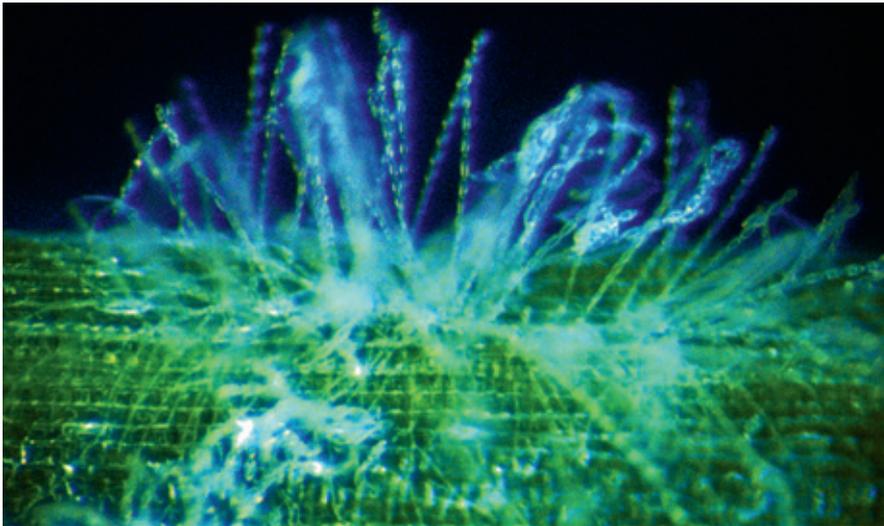


3D visualisation of the Olma exhibition space © Peter Schalch



# BREAKTHROUGHS IN PLANT SCIENCES

## PSC SYMPOSIUM DEC 5TH 2018



Powdery mildew thriving on a wheat leaf. © AG Sotiropoulos, University of Zurich

ETH Zurich  
Auditorium Maximum HG F30  
Rämistr. 101

### Registration

[www.psc2018.ethz.ch](http://www.psc2018.ethz.ch)

Poster abstract submission deadline  
is 1<sup>st</sup> November 2018.

Admission is free.

### Program

#### 9:00 Opening

Beat Keller, University of Zurich  
*20 years PSC – Plant research for the future*

#### 9:30–11:00

##### SESSION I: Plant signaling and development

Cyril Zipfel, University of Zurich  
Daphne Goring, University of Toronto  
Mark Estelle, University of California, San Diego

11:00 Poster Session

#### 11:30–13:00

##### SESSION II: Plant ecology and evolution

Detlef Weigel, MPI Tübingen  
Ansgar Kahmen, University of Basel  
Elena Conti, University of Zurich

13:00 Poster Session

#### 14:30–16:00

##### SESSION III: Technologies for plant improvement

Mark Aarts, Wageningen University  
Luca Comai, University of California Davis  
Caixia Gao, Institute of Genetics and Developmental Biology, CAS

##### Keynote – Global perspective on the importance of plant science research

Susanne Brink,  
Editor of Trends in Plant Sciences

#### 16:00

##### Poster awards and concluding remarks

Samuel C. Zeeman, ETH Zurich,  
PSC chair

### Organizing Committee

#### PSC doctoral students

Claudio Cropano, Sabrina Fluetsch,  
Maximilian Vogt, Tiago Miguel Dias Cruz,  
Alessio Maccagni, Miguel Loera Sánchez

#### PSC staff

Manuela Dahinden, Romy Kohlmann,  
Luisa Last

#### PSC steering committee

Bruno Studer, Elena Conti,  
Ueli Grossniklaus, Günter Hoch,  
Stefan Hörtensteiner, Jonathan Levine,  
Kentaro Shimizu, Thomas Städler,  
Samuel C. Zeeman

Follow @PlantSciCenter  
on Twitter #PSC2018

## Plant Receptor Kinases and Related Pathways Symposium

30 Oct 2018

Department of Plant and Microbial Biology  
Campus Botanical Garden, University of Zurich

This symposium is organized in parallel to the kick-off meeting of the SICOPIID ERA-CAPS consortium on plasma membrane receptor signaling complexes. It is an excellent occasion for a symposium in one of the hottest topics in plant sciences at the moment.

<https://rlk2018.eventbrite.com/>

Conference fee: CHF 25.

## Ecology and Evolution of Flowers Symposium 2018

*2<sup>nd</sup> International Symposium in memory of Prof. Stefan Vogel (1925–2015)*

24 & 25 Nov 2018

Department of Systematic and Evolutionary Botany  
Campus Botanical Garden, University of Zurich

This conference focuses on various aspects of floral evolution such as pollination, floral traits, mating system, macroevolutionary patterns and molecular mechanisms. The symposium is primarily aimed at giving young researchers the opportunity to present their data in a friendly and informal, yet high level and international research forum. The symposium includes talks by two international scientists that are leaders in the field (Steve Johnson and Lynn Adler).

[www.systbot.uzh.ch/en/flowerszurich2018/congress-registration](http://www.systbot.uzh.ch/en/flowerszurich2018/congress-registration)

Participation is free of charge.

## Interaction networks and trait evolution – 43<sup>rd</sup> New Phytologist Symposium

1–4 July 2019

University of Zurich

[www.newphytologist.org/symposia/43](http://www.newphytologist.org/symposia/43)



ETH Zurich

Auditorium Maximum HG F30, Rämistr. 101

For the last 20 years, the Tri-National Arabidopsis Meeting (TNAM) has become the premier plant science meeting in Europe that attracts many participants and also much international attention. In addition to two keynote lectures by Tetsuya Higashiyama and Wolf B. Frommer, TNAM 2019 features a broad scientific program highlighting frontier plant research on chromatin biology, development, evolutionary biology, from Arabidopsis to crops, membrane biology and trafficking, metabolism, RNA-based epigenetics, stress responses and technology development. Considering the outstanding selection of speakers, the 11<sup>th</sup> TNAM Conference again promises to be a success and an exciting opportunity to engage in discussions on frontier research.

## Registration

31 Dec 2018: Early bird registration deadline

15 Jan 2019: Deadline for submission of oral and poster abstracts

1 Mar 2019: Registration deadline

## Organizing Committee

Manuela Dahinden, Stefan Grob, Wilhelm Gruissem  
Kinga Rutowicz, Clara Sanchez-Rodriguez, Diana Santelia,  
Kentaro Shimizu, Sara Simonini, Olivier Voinnet

The Zurich-Basel Plant Science Center is a competence center linking and supporting the plant science research community of the University of Zurich, ETH Zurich and the University of Basel. The center promotes fundamental and applied research in the plant sciences. We seek creative approaches to research mentoring and coursework for students and postdocs, and we provide platforms for interactions with peers, policymakers, industry, stakeholders and the public.

## PSC Member Institutions

Department of Environmental Systems Science, ETH Zurich

Department of Biology, ETH Zurich

Department of Evolutionary Biology and Environmental Studies, University of Zurich

Department of Geography, University of Zurich

Department of Plant and Microbial Biology, University of Zurich

Department of Systematic Botany, University of Zurich

Department of Environmental Sciences, University of Basel

Zurich-Basel Plant Science Center, Coordination Office

[www.plantsciences.ch](http://www.plantsciences.ch)

