IPK Journal Digest

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Photo: IPK Leibniz Institute/ L. Tiller

"I VERY MUCH HOPE THAT WE SUCCEED IN THIS COUP"

Less than a year before the evaluation, Nicolaus von Wirén explains how the IPK is positioned.

The IPK's scientific excellence is still in good shape, assures Nicolaus von Wirén. "Again, there were many high-calibre publications in 2024, including in 'Science' and 'Nature'", says the Managing Director of the IPK. "We also received great recognition from the Scientific Advisory Board for our overall publication performance. One particular success is that important advances and high-calibre publications are not just the work of one or two research groups, but that several contribute to them", says Nicolaus von Wirén. "New research infrastructures must be successfully incorporated into these publications. What has already been achieved, at least in part, with NMR and PhenoSphere must be continued to raise the profile of the IPK further."

Successful collaborations, above all with the CEPLAS Cluster of Excellence, strengthen scientific excellence and sharpen the profile. The IPK would like to join this in the future. "This would open up completely new perspectives for the IPK. As a partner, we can get new cooperation projects at the IPK, where we can benefit greatly from the excellent basic research and method development in CEPLAS. If we are successful, we will also receive a new professorship in the field of root-microbiome interactions, which fits perfectly into our research portfolio", says Nicolaus von Wirén. Following the DFG's review of the proposal in December 2024, he expects a final decision in May 2025. "I very much hope that we succeed in this coup. Many of our colleagues at CEPLAS have great ideas, real drive, and the courage to tackle riskier issues. And I am sure that CEPLAS can also provide new and fresh impetus at the IPK, motivating us even more."

Another important pillar is the new Collaborative Research Centre (Sonderforschungsbereich) "Plant Proteoform Diversity", approved by the German Research Foundation in May. The IPK is one of four partners from Central Germany. At its core, it is about combining protein and plant research. "Ideally, such a Collaborative Research Centre is the basis for an excellence initiative. In terms of content, the projects will initially focus on the model plant Arabidopsis, but in the second round, it is planned to extend this to barley. And then we will also be increasingly involved as an applicant with our expertise", explains Nicolaus von Wirén.

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“WE WANT TO OPEN THE BLACK BOX”

Marcel Quint from Martin Luther University Halle-Wittenberg explains the aims of the new Collaborative Research Centre (CRC) “Plant Proteoform Diversity”, in which the IPK is involved.

Proteins are also the key to understanding plant processes. “We already know a lot about DNA and the phenotype. But the step in between, the proteins, are still a black box that we now want to open”, says Marcel Quint. “We want to investigate what effect natural genetic variation has on the structure and thus on the function of proteins because this ultimately determines the properties and characteristics of the plant.” The CRC is, therefore, also about linking protein and plant research. The researchers want to start at the level of the individual nucleic bases. This is because even one mutation can change an amino acid and thus influence the structure and function of proteins made up of amino acid chains. However, the structure of proteins is much more complex than the structure of DNA. This is because the amino acid chains fold and take on different shapes. This 3-D structure characterises proteins.

The project is divided into three phases, each lasting four years. A sum of 13.4 million euros is available for the first phase. “First, we must show that genetic diversity results in different protein structures. So, we have to show that we can fill the black box”, says Marcel Quint, the spokesperson for the CRC. The second step is to be able to make predictions. The aim is to find out which mutations change the structure of the proteins. “And in the final phase, we want to show that we can design proteins. At the very least, we want to show that it works.”

The CRC partners also hope to gain new insights concerning climate change. The question is whether we can design proteins in such a way that they can continue or, even better, fulfil their function under changed environmental conditions.

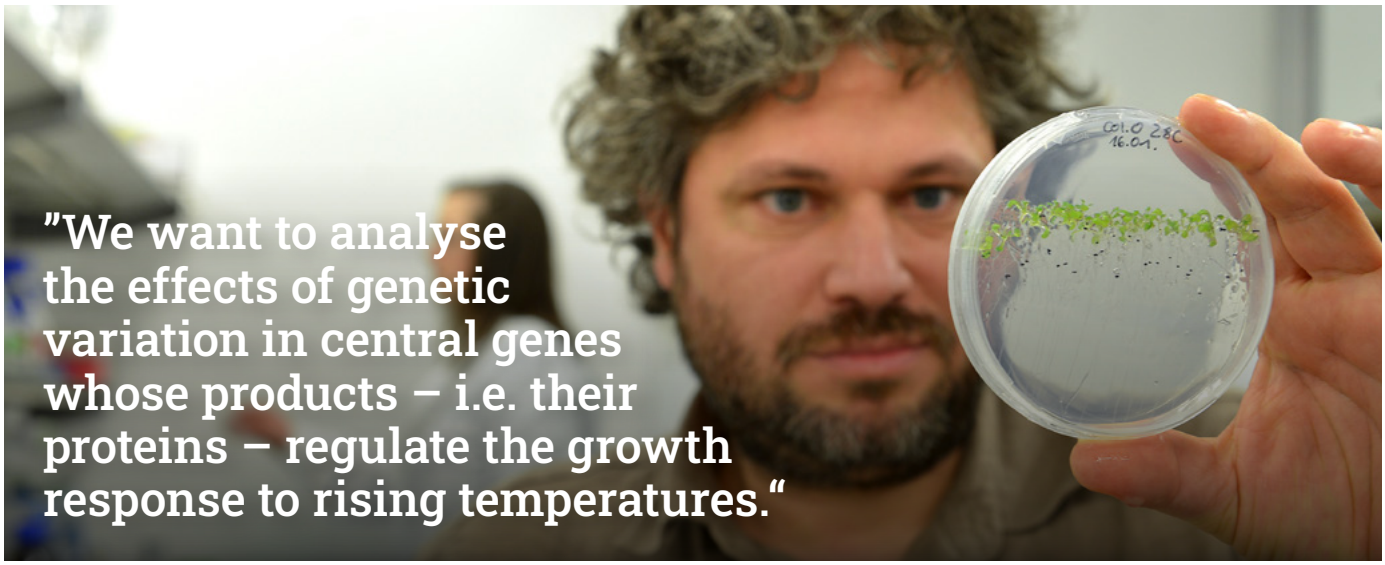

Photo: Uni Halle/ Markus Scholz

SCIENCE IN THE MONASTERY

Young researchers from the CEPLAS Cluster of Excellence and the IPK organised jointly the second International Summer School in Drübeck in the Harz Mountains.

Monastery and science – this combination apparently works very well. After the premiere in May 2022 at Steinfeld Monastery (North Rhine-Westphalia), more than 40 young scientists from the Cluster of Excellence for Plant Sciences CEPLAS and the IPK Leibniz Institute met in Drübeck in the Harz Mountains in September for the second joint International Summer School. For five days, ten sessions and several workshops centred around the topic of “Translational Plant Biodiversity Research”.

The organisers were not only able to attract scientists from CEPLAS and IPK for the lectures at Drübeck Monastery but also from many international research institutions, including many European countries as well as Kenya and Malaysia. The programme also included numerous workshops on topics such as scientific writing, science communication and networking.

“On the one hand, we wanted to get young people interested in plant research and impart a lot of specialised knowledge to them, but on the other hand, we also wanted to present our institutions – CEPLAS and IPK – and show them career options there”, says Laura Armbruster, a scientist at the University of Cologne. She was a participant at the last summer school and was now part of the organising team, including IPK event manager Lisa Schlehuber.

BETWEEN WOODWORM, EDELWEISS AND A GREEN BRA

Library assistant Anja Ewerhardy looks after the oldest books in the IPK's collection and has many a curiosity to tell.

Photo: IPK Leibniz Institute/ L. Tiller

Anja Ewerhardy taps a book cover from 1591 a few times with her index finger. Wood? Yes, the cover is made of wood. And you can not only hear it, you can also see it. "Look, the woodworm has marched right through here", says the 55-year-old, pointing to the holes in the same place on every page as she turns the pages.

Since the summer, she has also offered the institute's staff guided tours. She knows that old books can tell very special stories, like a work from 1588, which she also took out of the grey steel cabinet.

A small green spot stands out in an elaborately designed black-and-white drawing. Only at a second glance can you see that a woman is wearing a green bra. "It was probably added later by a child out of boredom."

Sometimes, there are surprises in the books, such as in a relatively recent book from 1914 on Flora in Bavaria. "I found an edelweiss plant between two pages." She surmises that researchers may have placed it in the book after an excursion and then forgotten about it.

CITIZEN SCIENCE, MICROORGANISMS AND THE COP16

The 2024 Journalists' College focussed on biodiversity – in line with COP 16, which had just occurred in Colombia.

Leopoldina, Crop Trust, Science Press Conference, CEPLAS – it is already a tradition for the IPK to choose a partner for its annual Journalists' College. The choice of the German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig in 2024 was evident for two reasons: in terms of location because iDiv is already a well-known cooperation partner from central Germany. In terms of content, its expertise could contribute significantly to this year's biodiversity topic.

With Solveig Richter (Leipzig University and iDiv), Josef Settele (Helmholtz Centre for Environmental Research and iDiv) and Jens Freitag (IPK), the journalists were able to have three people report on the negotiations at COP16 in Cali in Colombia, in October.

Photos: IPK Leibniz Institute

Photo: G. Leefken/ JKI

THE WOODSMAN

Henrik Hartmann has headed the Institute of Forest Protection at the Julius Kühn Institute (JKI) since 2022 and recently visited the IPK.

Fires, bark beetles and photos of huge bare areas. The situation in the Harz forests is worrying. But the region is not an isolated case. "The Harz is already a pretty accurate reflection of the poor condition of many German forests", says Henrik Hartmann. "We simply can no longer effectively protect the forest to preserve it in its current form. Take the spruce: it is simply dying too quickly to be protected."

Romantic notions of the forester in the pine forest opened the hearts of many people, but at the same time, they obscured their view of the actual situation. "To put it bluntly: we will not be able to preserve the forest in its current form; we are facing an enormous upheaval."

Henrik Hartmann is treading new paths in his search for solutions. "We don't know exactly what kind of future we will have, so we are using various models as time machines", explains the Institute Director. "For this reason, we are developing digital forest twins, i.e. model versions of real forests, and feeding them with real-time data from the forest so that the models learn from nature", explains the JKI scientist. "It's like in aviation, flight simulators are digital twins in which pilots interact with the aircraft as they would, in reality, to prove themselves suitable for the first real take-off on the simulator."

Photo: IPK Leibniz Institute/ L. Tiller

GATERSLEBEN RESEARCH PRIZE GOES TO BIELEFELD AND POTSDAM

Hanna Marie Schilbert and Mustafa Bulut have been awarded the Gatersleben Research Prize 2024.

The prize, awarded by the Association for the Promotion of Crop Plant Research, aims to promote young scientists in plant genetics and crop plant research. The award, which the association presents every two years with the support of the Salzlandsparkasse and the IPK Leibniz Institute, comes with prize money of 1,500 euros per winner in 2024. A total of 16 entries were submitted. "As the works of Hanna Marie Schilbert and Mustafa Bulut were very close to each other in the internal ranking and the external reviews, we decided to award the prize to both of them", explained Andreas Houben, Managing Director of the association.

Hanna Marie Schilbert completed her doctoral thesis at Bielefeld University, Mustafa Bulut, and is a postdoc at the Max Planck Institute of Molecular Plant Physiology in Potsdam.

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