

IPB Newsletter 2011



From the Managing Director

Dear colleagues, friends and partners of the IPB,

2011 was a year with many official visits, inaugurations and science policy motivated activities. In February we welcomed our former Minister of Education professor Birgitta Wolff. After the election of the parliament of Saxony-Anhalt she continues supervision of the universities and the non-university institutes under the new title Minister of Scientific and Economic Affairs. Also due to this reorganization, we had the pleasure to greet our new Secretary of State Marco Tullner.

The new President of the Leibniz Association Karl-Ulrich Mayer mixed business with pleasure. He visited our institute on March 3rd and one day later signed the **cooperation treaty of the new ScienceCampus** „Plant-based bio-economy“ in Halle together with the Minis-

ter of Education, the Rector of the MLU and the Managing Directors of the Leibniz institutes IPB, IPK and IAMO.

Further activities brought life and motion: in May we inaugurated the most modern **phyto-chambers** in Germany. The ceremony attracted the interest of numerous representatives of economics, science and politics; the media gave detailed and supra-regional reports. Our PhD students were very active, organizing the **7th Plant Science Student Conference** at the IPB. Furthermore the **10th Long Night of Sciences** succeeded, attracting nearly 700 visitors.

The prospects for novel research are also very positive. Under the leadership of professor Scheel the institute got 1,2 million euros for the new project „**Chemical communication in the rhizosphere**“. **Marco Trujillo** is now well-established as head of the IPB Junior Research Group.

The head of administration of the IPB was briefly vacant due to the departure of Lothar Franzen. Mr. Franzen fostered the development of the IPB after the reunification of Germany with much hard work and a strong personal commitment.

The IPB was able to attract an excellent replacement with the engagement of **Christiane Cyron** since October 1st. The directorate is very pleased to be working with Mrs. Cyron, and to see the new impulses and energy she brings to this important position.

We hope you will find the chosen topics informative and wish you an enjoyable read!

Yours sincerely,

Ludger Wessjohann
Managing Director of the IPB

IPB Newsletter 2011



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Personalía/ Welcome at the IPB



Department MSV



In January Dr. Luz Irina Alejandrogna Calderón Villalobos joined Steffen Abel, the new head of the MSV research group *Signal Integration*. The native-born Colombian with the long, beautiful name studied microbiology at the *University of the Andes* in Bogotá and got her PhD in February 2006 at the *Center for Plant Molecular Biology* at the *University of Tübingen*. Her topic there was ubiquitin-proteasome-dependent signaling pathways in *Arabidopsis*. Afterwards she worked as a postdoc at *Indiana University* in Bloomington and at the *University of California* in San Diego. At the IPB she will deal with the

molecular mechanisms of the phyto-hormone auxin.

Junior research group I

In April 2011 Dr. Marco Trujillo established the junior research group *Ubiquitination in Immunity*. Marco Trujillo also studied microbiology at the *University of the Andes* and got his PhD at the *Institute of Phytopathology and Applied Entomology* in Gießen. From 2006 until 2008 he was a Humboldt Fellow at *Japanese Association for Knowledge Policy* and worked at the *RIKEN Plant Science Center* in Japan. From 2008



he was head of his own research group at the *Institute for Pharmaceutical Biology* in Würzburg. His research project at the IPB focuses on the linkage of proteins with ubiquitin as part of processes of plant defense against pathogens. To date, ubiquitin was known as a central cellular regulatory element of protein degradation and transport. But recent research results have shown it is also involved in signaling pathways of immunity.

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Personalia/ Junior research groups/ Foundation council



Junior research group II



A further candidate for the leadership of a second independent junior research group is **Dr. Nico Dissmeyer**. He studied from 1999 until 2005 in Tübingen, Berlin and Corvallis (USA) biochemistry, philosophy and biophysics. In 2009 he received his PhD at the *Max Planck Institute for Plant Breeding Research* in Cologne and worked afterwards as a postdoc at the *CNRS Institute for Molecular Biology of Plants* in Strasbourg (France). Since March Nico Dissmeyer is a member of our institute. His work deals with **protein recognition and degradation**. Furthermore he also ana-

lyzes the specific role of the cellular degradation protein ubiquitin.

Foundation council



Thomas Reitmann

Since January 2011 the personnel composition of the **foundation council** has changed. *Thomas Reitmann* from the Ministry of Scientific and Economic Affairs of Saxony-Anhalt is still leader of the council. In addition *Prof. Dr. Sabine L. Flitsch* from the University of Manchester und *Prof. Dr. Andreas Schaller* from the University of Hohenheim, Stuttgart act as representatives of the advisory board.



Prof. Dr. Sabine L. Flitsch



Prof. Dr. Andreas Schaller

New representatives joining this year include: *Dr. Henk van Liempt* as representative of the Federation, *Prof. Dr. Birgit Dräger* as representative of the Rector of the Martin Luther University Halle-Wittenberg, as well as *Prof. Dr. Lutz Heide* from the University Tübingen as representative of the scientific life.

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Foundation council



Dr. Henk van Liempt



Prof. Dr. Birgit Dräger



Prof. Dr. Lutz Heide

Equal opportunity commissioner

In March of this year female members of the IPB elected an **equal opportunity commissioner**.

Kerstin Manke won an additional

four-year term, and **Sylvia Krüger** was selected for a first term as her deputy.



In the future the two will be at your disposal in case of any equal opportunity related questions or problems.



Institute council



The WIR selected **Prof. Dr. Bernhard Westermann** as the new Institute Council Speaker; **Dr. Justin Lee** will serve as his deputy. They relieve Dr.

Wolfgang Knogge, who was speaker of the last two years. Because of a new ordinance, a speaker of the PhD students (**Juliane Fischer**) as well as a representative of the postdocs (**Carolin Delker**) are also members of the scientific institute council and are entitled to vote.





Postdoc council



Beginning this year, there is also a postdoc council for the common representation of their interests. Speaker of the council is **Dr. Carolin Delker**

(department *Molecular Signal Processing*). **Dr. Jens Müller** (also department *Molecular Signal Processing*) was elected as her deputy.



department SZB. She undertakes the tasks of Ildikó Birkás during her maternity leave.

New head of administration

Since October 2011 **Christiane Cyron** has undertaken the administrative leadership of the IPB. Mrs. Cyron studied economics in Constance and was chancellor and business manager of the faculty



of law at the University of Hamburg. The directors of the IPB are very pleased about her acceptance. „We are convinced, that we can continue the positive development of the IPB with Mrs. Cyron and that we can cope with the challenges of the next years cooperatively and professionally. We will support Mrs. Cyron to settle into our institute quickly“, says the Managing Director professor Wessjohann.

We wish Mrs. Cyron a successful beginning at the IPB!

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Office SZB

Since September 2011 **Alexandra Herrmann** is the new secretary of the

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Personalia/ PhD student news



The PhD students were also very active in many respects over the last year. The PhD speakers of this period **Susanne Forner (SZB)**, **Juliane Fischer (NWC)**, **Kristian Ullrich (MSV)** and **Pascal Pecher (SE)** were very committed, to offer a lot of events to the postgraduates of the institute; both in regard to scientific topics, and to social additions to the working life of the PhD students.

In June the *Plant Science Student Conference (PSSC)* took place at the IPB, which was planned and organized by our PhD students exclusively. In addition new English lessons comprising 20 hours have been started, which are partly financed by the IPB and are very well accepted by our PhD students. Furthermore a course was organized, with the intention of improving the scientific

writing in English of the postgraduates. Leisure activities include monthly organized PhD regulars' tables, English game evenings and various parties.

Scientific Writing

On 11 and 12 October of this year a course for scientific writing took place for the PhD students of the IPB. The workshop *Writing and Publishing Research* was fully financed by the institute and was organized for 16 persons. The training comprises English grammar, punctuation, spelling and certain abbreviations, but also writing skills, style and precision of scientific formulations. This kind of workshop was given last year by Dr. Dorothea Sommerfeldt and received a positive response from all participants. The PhD speaker **Julia-**

ne Fischer can recommend the course for every PhD student: „The important topics are presented in a clear and easy manner. Students can work with their own texts. The writing of a publication is explained from the abstract to the discussion. In total the workshop is a very good preparation for the formal written presentation of results, which is important for every scientist.“

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Personalia/ PhD student news



All Hallow's Eve

Under the motto *Halloween meets Erntedank* the PhD speakers of the previous year organized a Halloween party for all PhD students of the IPB in November 2010.

Access to the party was only granted with creepy costumes, resulting in a



number of very creative outfits. In addition, the nomination of the new PhD speakers by the old ones took place during the party.

In return for their strong commitment the departing speakers received a de-



coration and a big cake. All the witches, devils and vampires really enjoyed the evening with creepy food.

The next Halloween Party will take place on **18 November** this year in the Kurt-Mothes-Saal. From **7 pm** you can bring again most horrible foods and wear your creepiest outfits to celebrate true witching hours.

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Personalia/ PhD student news



All Hallow's Eve 2010 - Some Impressions



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Personalia/ PhD student news



PSSC 2011

This year the IPB was chosen to host the *Plant Science Student Conference* (PSSC). The event is organized once a year alternately by the IPK in Gatersleben or the IPB and brings together PhD



students from different renowned plant research institutes of Central Germany

for a useful exchange of their research experiences. The PhD students therefore present their projects in talks and posters. The conference was held from 14 to 17 June and was organized by our PhD students exclusively. This required long-range planning and a great talent for organization, because not only the overall process of the conference but also the catering, the draft of the conference logo, flyers, name tags and t-shirts as well as the invitation of the guest speakers was in the hands of the PhD students.

The well-organized course was well-received by our guests, as were the hiking trip and visits to Giebichenstein castle, the Amtsgarten and the Reichardtsgarten.

The invited guest speakers were **Dr. Teun Munnik** from the Swammerdam Institute for Life Sciences of Amsterdam, **Prof. Dr. Paul Schulze-Lefert** from the Max Planck Institute for Plant Breeding Research in Cologne, **Prof. Dr. Werner Klaffke** from the Unilever Foods & Health Research Institute as



well as **Prof. Dr. Ingo Heilmann** from the Institute for Biochemistry of the

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Personalia/ PhD student news



Martin Luther University Halle-Wittenberg. They enriched the conference with interesting talks and inspiring discussions.

The best talks and posters were evaluated by the PhD students themselves and by a jury. Awards were presented on the last day. The PhD students selected **Hendrik Mehlhorn** from the IPK and **Susanne Forner** from the IPB as winners for the best talk and the best poster, respectively. Both of them got a hard disk with 500 GB storage space.



from the IPB, followed by **Anja Raschke** also from the IPB and **Raimund Nagel** from the Max Planck Institute for Chemical Ecology in Jena.



The winner of the first rank got an annual subscription for a scientific journal (**Spektrum der Wissenschaft** as well as **Plant Biology**).

The jury, consisting of **Prof. Dr. Claus Wasternack** und **Dr. Michael Walter** (IPB) as well as Dr. Teun Munnik, was also very active. They awarded three places each for the best talk and the best poster. The gold medal for the best talk was received by **Martin Stegmann**

The first place for the best poster went to **Pascal Pecher** from the IPB, the second and the third place were given to **Stephanie Werner** from the Institute for Biochemistry from the MLU Halle-Wittenberg and **Daniel Penselin** from the IPB, respectively.



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Personalia/ PhD student news



The students, who took second place could look forward to a voucher for books from the specialized bookstore Lehmanns. An USB memory stick as well as a laser pointer were the presents for the third-place winners.

The meeting ended with a barbecue for all participants. A special toast was proposed to the success of the conference as well as next year's incarnation at the IPK in Gatersleben.



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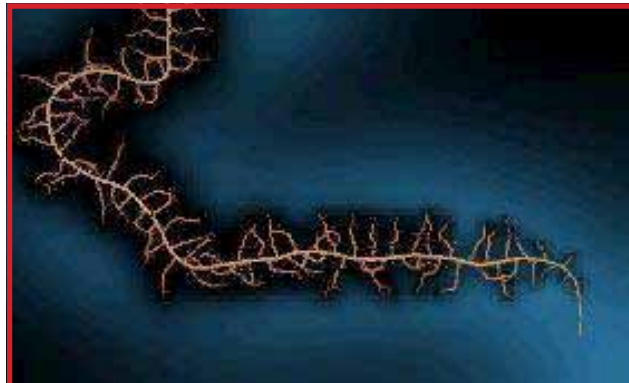


Back to the roots - Chemical communication in the rhizosphere

It is generally known that plants are bound to their location by the roots. Despite this sessile lifestyle the plants are not completely defenseless against adverse environmental conditions. Rather they have mechanisms that help them cope with drought, nutrient deficiency, pathogens and other stress factors. To a large extent they do this with their roots. Plants are able to adapt and modulate the vicinity of their roots (**rhizosphere**) according to their individual needs. How they do this is the subject of a major new research initiative as part of the **Pact for Research and Innovation** at the IPB.

The Pact project *Chemical communication in the rhizosphere* was funded with 1,2 million euros by the Leibniz association starting in April 2011. With this money the scientists of the Leibniz Institute of Plant Biochemistry (IPB) together with their cooperation partners at the Martin Luther University (MLU) and other non-university research institutes want

to use ideas, technologies and competencies to get a better understanding of rhizosphere dynamics.



The immediate environment of the root is called rhizosphere. It can be modulated by the plant in adaptation to changing environmental conditions.

In terms of the current state of knowledge, the root is hardly investigated. But it is known that roots can secrete substances into the soil, which can modulate their immediate environment. These substances consist of a mixture of sugars, proteins, organic acids, secondary

substances and other components. The composition of these so-called root exudates is not constant. The nature and quantity of the components instead change dynamically due to the developmental stage of the plant (e.g. germination, growth, flowering and seed production) or in response to changing environmental factors.

Subprojects

Within the Pact project a complete review of all components of the root exudates and their changes under specific conditions will be performed and documented. Toward this end, *Arabidopsis thaliana* will be grown under nutrient deficiency and the correlating root exudate patterns will be investigated.

Another subproject involves the genetic background. Different plant species develop different patterns of exudates. These differences are genetically determined. Therefore 19 *Arabidopsis* ecotypes will be analyzed to clear up

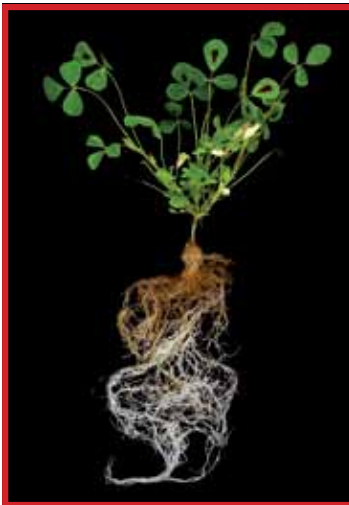
Research news |



the association between the genetic constitution and exudate patterns.

Furthermore the positive or negative effects of specific compositions of root exudates on microbe populations in the rhizosphere will be investigated.

A final project comprises the inventory of all exudate components after contact of the roots with mycorrhizal fungi. Therefore the close interaction of the model plant *Medicago truncatula* with the fungus *Glomus intraradices* will be intensively studied.



Model plant for mycorrhization

The root of *Medicago truncatula* in symbiosis with the mycorrhizal fungus *Glomus intraradices*.

Aim and objectives

With the knowledge of the exact chemical composition of the root exudates the association between root communication and plant vitality will be explained. The better understanding of the genetic regulation of the exudate production will lead in the future to the possibility of breeding more vital plant species, whose roots are able to „rule“ the chemical communication better than others and react therefore faster and more flexibly to adverse environmental conditions.

Faced with urgent agronomic problems the partners of the Pact plan have responded with the initiation of an ambitious interdisciplinary rhizosphere consortium.

„The biology of the rhizosphere is a major project“, says Dierk Scheel. „This is only manageable in cooperation with our partners.“

The Pact for Research and Innovation

is a federal funding initiative of the non-university research institutes, the counterpart to the Excellence Initiative, which funds German universities. Inside the Leibniz association the money of the Pact is distributed in terms of a competition among institution members. Every Leibniz Institute has the possibility to make an application only once a year. The IPB was already involved five times since the beginning of the funding period 2006, four of them as the main applicant.

Other partners of the Pact project *Chemical communication in the rhizosphere* are the [Leibniz Institute of Plant Genetics and Crop Plant Research in Gatersleben \(IPK\)](#), the [Leibniz Institute of Vegetable and Ornamental Crops Großbeeren \(IGZ\)](#), the [Helmholtz Centre for Environmental Research Halle \(UFZ\)](#) and the [Martin Luther University Halle-Wittenberg \(MLU\)](#).

Research news II



Trapped ions - A new mass spectrometer at the IPB

Since fall of this year the department of *Stress and Developmental Biology* has a new high performance mass spectrometer. The device *LTQ Orbitrap Velos Pro* is a hybrid of a linear Iontrap and an Orbitrap analyzer and comes from the newest generation on the market. It was half financed by resources from the European Regional Development Fund (ERDF).

With the help of this mass spectrometer, complex protein mixtures will be analyzed cross-departmental, co-operative projects. For example, special proteins with attached phosphate residues will be identified. These phospho-proteins play an important role in diverse physiological reactions of plants such as defense against pathogens or other stress factors.



From the outside it seems rather unspectacular, but inside the Orbitrap hides a complicated technology, which makes it possible to do very sensitive analyses (right). The photo above shows a view of the ion source.

Events 2011



Foundation of the ScienceCampus „Plant-based bio-economy“ in Halle

With the signing of the cooperation agreement between the State of Saxony-Anhalt, the Martin Luther University and the Leibniz association on 4 March 2011 the third science campus in Germany, following the ones in Tübingen and Rostock, was founded in Halle. It is intended to strengthen the cooperation of the three Leibniz Institutes (IPB, IPK und IAMO) and the Faculties of Natu-

ral Sciences of the MLU in the area of *Plant-based bio-economy*. The project is financed by the State of Saxony-Anhalt with 1,4 million euros and by the Leibniz association with 150.000 euros.

The promotion of scientific excellence in this context should last over the next seven years in total and is expected to contribute to local economic development.

The model *ScienceCampus* stands for a special cooperation of university and non-university research. It was initiated and put into practice for the first time by the Leibniz association in 2009 with the foundation of the science campus in Tübingen.



The signatories of the contract (from left to right): Professor Thomas Glauben (Leibniz Institute of Agricultural Development in Central and Eastern Europe), Professor Udo Sträter (Rector of the Martin Luther University Halle-Wittenberg), Professor Birgitta Wolff (former Minister of Education of the State of Saxony-Anhalt), Professor Karl Ulrich Mayer (President of the Leibniz association), Professor Ludger Wessjohann (Leibniz Institute of Plant Biochemistry) and Professor Andreas Graner (Leibniz Institute of Plant Genetics and und Plant Breeding Research)

Events 2011



Inauguration of the new phytochamber building

On 6 May 2011, Germany's most modern phytochamber facility was inaugurated. It contains eight accessible plant growing chambers, two of them equipped with high performance LED technology.



The model plant *Arabidopsis thaliana* in the plant growth chamber.

With the help of the LED lamps one can cover the whole spectrum of sunlight and can imitate the lightning conditions throughout

the day, including dawn. With this innovation the IPB is the first institute in Germany and the second in Europe, that can grow plants with LED lamps.

Furthermore the phytochambers have a very sophisticated control system that allows precise control of temperature, humidity, light spectrum and lighting duration. This degree of control should lead to very high reproducibility of experimental results.

With its 21 phytochambers, the IPB has outstanding technical equipment for plant growth experiments, much better than the average in Germany and throughout Europe. The new phyto-

chamber facility was financed with 3,6 million euros by the Konjunkturpaket II. The inauguration of the new phytochambers drew very favorable attention from representatives from the media and politics and



Professor Ludger Wessjohann gave a speech for the numerous guests.

resulted in a television report, several radio features and a large number of articles in the regional press.

Events 2011



Long Night of Sciences 2011

On 1 July 2011 the 10th *Long Night of Sciences* took place in Halle. With approximately 700 guests this has been also an outstanding success for the IPB. There was really much to discover for young and old visitors.

Very popular for the children was the *Street of experiments*, which gives access to scientific topics in a playful manner to young researchers. For the adults there were guided tours through the greenhouse and demons-



The *Street of experiments*: filling up tip boxes and DNA-Isolation from bananas.



Guessing different aromas.



Dr. Bettina Hause explains the function of the confocal laser scanning microscope (LSM).

trations of the confocal laser scanning microscope (LSM). Furthermore interested visitors could get information about diverse fungal species, had a closer look at mycorrhizal roots under the microscope or followed the chromatographic separation of plant pigments.

Events 2011



Members of the department NWC explain the principle of the chromatographic separation of plant extracts.



Dr. Carolin Delker leads the visitors through the IPB.



Many prizes for the young researchers.

The event attracted great interest from the media. Both the *Mitteldeutsche Zeitung* and the radio station *mdr info* made interesting contributions on Saturday 2 July.



Christian Müller helps the guests to guess different herbs.



Mycorrhizal roots under the microscope.

Miscellaneous



IPB Fundraising campaign



On 13 May of this year the laptop of our colleague **Dr. Adama Hilou** was stolen from the IPB library. With the loss of the valuable device all stored data were irretrievably lost.

To help Dr. Hilou, the members of the IPB collected money in a major fundraising effort. Because of the financial support, he was able to buy a new laptop for himself. Dr. Hilou was very touched and expressed his warmest thanks to all the helpers.

PhD speaker election

The PhD speakers of the annual period 2010/ 2011 were very active and mastered the challenges of this year with high demands on themselves. On 19 October the PhD students of the IPB elected their new speakers.



In addition to Susanne Forner (SZB) and Juliane Fischer (NWC), who were already PhD speakers last year, Michael Gerlich (SE)

and Antje Hellmuth (MSV) were elected for this post. They replace Pascal Pecher and Kristian Ullrich.



We wish the new speakers a good start for the next year's period!

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