Doctoral Programme

Research is at the core of the 3-year programme of IMPRS-PMPG. We provide a unique training opportunity in plant genomics and systems biology, with English as the working language. Our research projects follow a range of approaches – from molecular physiology to bioinformatics and modelling. You will be registered at the University of Potsdam and receive a doctoral degree from the University's Faculty of Mathematics and Natural Sciences.

IMPRS-PMPG offers …

- Excellent research facilities for your thesis project
- Supervision of your research progress by a member of the IMPRS faculty and a thesis committee
- Interdisciplinary scientific training through lecture series and seminar courses covering various aspects of systems biology-oriented research, such as analytical -omics technologies, genetics, molecular biology, physiology, biochemistry, bioinformatics, statistics, and modelling
- Active participation in institute seminars and conferences
- Training in complementary skills covering scientific presentation and writing, patents and entrepreneurship, ethical aspects etc.
- Career workshops and assistance in developing your personal career plan
- Support for practical matters such as visas, housing, health insurance, and registration at the University of Potsdam

Campus Life

More than 100 doctoral candidates study under the guidance of the above mentioned faculty, their groups, and departments. This vibrant research community offers many opportunities for discussion and exchange of ideas. Several sports and other cultural activities take place on campus – you can join the institute's football team or enjoy a game of beach volleyball, for example.

The Max Planck and University Campus Golm is located in Potsdam, an attractive city with a population of 150,000. Potsdam is home to the famous Sanssouci Palace, many lakes, and beautiful parks. Within Potsdam, it is easy to get around on foot and by bike or public transport. A wealth of cultural life can be enjoyed in Potsdam itself and in Berlin, which is only a stone's throw away and well connected by public transport.

Application

Application is open for students holding a Master's or equivalent degree in biology, biochemistry, chemistry, physics, informatics, mathematics, or related fields. For further information, calls for applications, and the online application form, please visit our website:

http://www-en.mpimp-golm.mpg.de/IMPRS_GoFORSYS/index.html

Contact
Programme Coordinators:
Dr. Ina Talke · PD Dr. Carsten Müssig

IMPRS-PMPG
Max Planck Institute of Molecular Plant Physiology
Science Campus Golm · Am Mühlenberg 1
D-14476 Potsdam · Germany
Phone: +49 (0)331 567 84 44
Fax: +49 (0)331 567 84 08
Research-school@mpimp-golm.mpg.de

IMPRS
Primary Metabolism and Plant Growth

International Max Planck Research School

Doctoral Programme in Plant Genomics and Systems Biology at the Max Planck Institute of Molecular Plant Physiology and the University of Potsdam

Universität Potsdam

MAX-PLANCK-GESELLSCHAFT

Research Focus of IMPRS-PMPG: Primary Metabolism and Plant Growth

Multicellular organisms have to adjust their growth to a multitude of exogenous and endogenous cues. In order to thrive, they have to optimize the use of available resources to fit their needs for energy, biosynthetic building blocks, and reserves. Green plants produce all their own organic compounds from inorganic substances. A plant's ability to grow depends entirely on its photosynthetic and metabolic capacity.

The rate of growth has to be adjusted to the metabolic status of a plant; to achieve this, the latter needs to be translated into an appropriate response. Thus, growth and primary metabolism are highly interconnected via multiple cross-acting regulatory mechanisms.

The study of the relationship between primary metabolism and growth is the focus of the IMPRS-PMPG, a joint initiative of the University of Potsdam and the Max Planck Institute of Molecular Plant Physiology. We are following a systems-oriented approach, primarily using *Arabidopsis thaliana* as a model organism. Our research combines molecular phenotyping (-omics) technologies and cutting-edge analytical techniques with bioinformatics and modelling approaches.

Faculty of the IMPRS-PMPG

Our faculty includes professors and group leaders from the Max Planck Institute of Molecular Plant Physiology and the University of Potsdam. Please visit our website for a more detailed description of their research activities.

Isabel Bäurle (University of Potsdam)
How plants "remember" past exposure to stress and adapt to abiotic stress in the long term. The roles of epigenetic and chromatin regulation in this process.

Ralph Bock (MPI-MP)
Gene expression in plant cell organelles, interactions between the nucleo-cytosolic compartment and the organelles. The evolution of eukaryotic genomes and interactions between plants in populations and ecosystems.

Ingo Dreyer (University of Potsdam)
Biophysical principles of plant physiology. How plants sense, take up, and transport nutrients. Synthetic biology in plant systems.

Franziska Krajinski (MPI-MP)
Molecular, cell biology, genetic, and genomics approaches to understand the mechanisms underlying the development of plant-microbe interactions with major focus on the arbuscular mycorrhiza symbiosis.

Bernd Müller-Röber (University of Potsdam)
Plant growth control and responses to environmental stress through signalling mechanisms involving transcriptional regulatory networks. Systems-oriented approaches for the analysis of leaf growth.

Zoran Nikoloski (University of Potsdam)
Data-driven modelling and analysis of biological networks. Evolutionary and optimization processes yielding condition- and species-specific genome-scale interactions.

Staffan Persson (MPI-MP)
Deciphering how cellulose, which is the world's most abundant biopolymer and a key morphological component for the plant cell, is synthesized and incorporated into the cell wall matrix.

Michael Schroda (University of Potsdam)
Plant molecular chaperones, their interactions and functions. Systems approach to plant stress responses. Analysis of mechanisms that counteract transgene silencing.

Waltraud Schulze (MPI-MP)
Mass spectrometry-based proteomics approaches to study adaptation to changing nutrient conditions. Analysis of posttranslational modifications, protein dynamics, and protein-protein interactions.

Joachim Selbig (University of Potsdam)
Machine learning to glean information from and detect unforeseen relationships within large data sets produced using functional genomics strategies.

Martin Steup (University of Potsdam)
Plant carbohydrate metabolism and protein-carbohydrate interactions including covalent modifications.

Mark Stitt (MPI-MP)
Systems-oriented approach to carbon and nitrogen metabolism. How primary and secondary metabolism are integrated and regulated, and how signals from metabolism regulate plant growth and development.

Lothar Willmitzer (MPI-MP)
Plant systems approach on metabolism in its broadest sense, using reverse genetics and functional genomics to analyse the pleiotropic effects of these alterations.