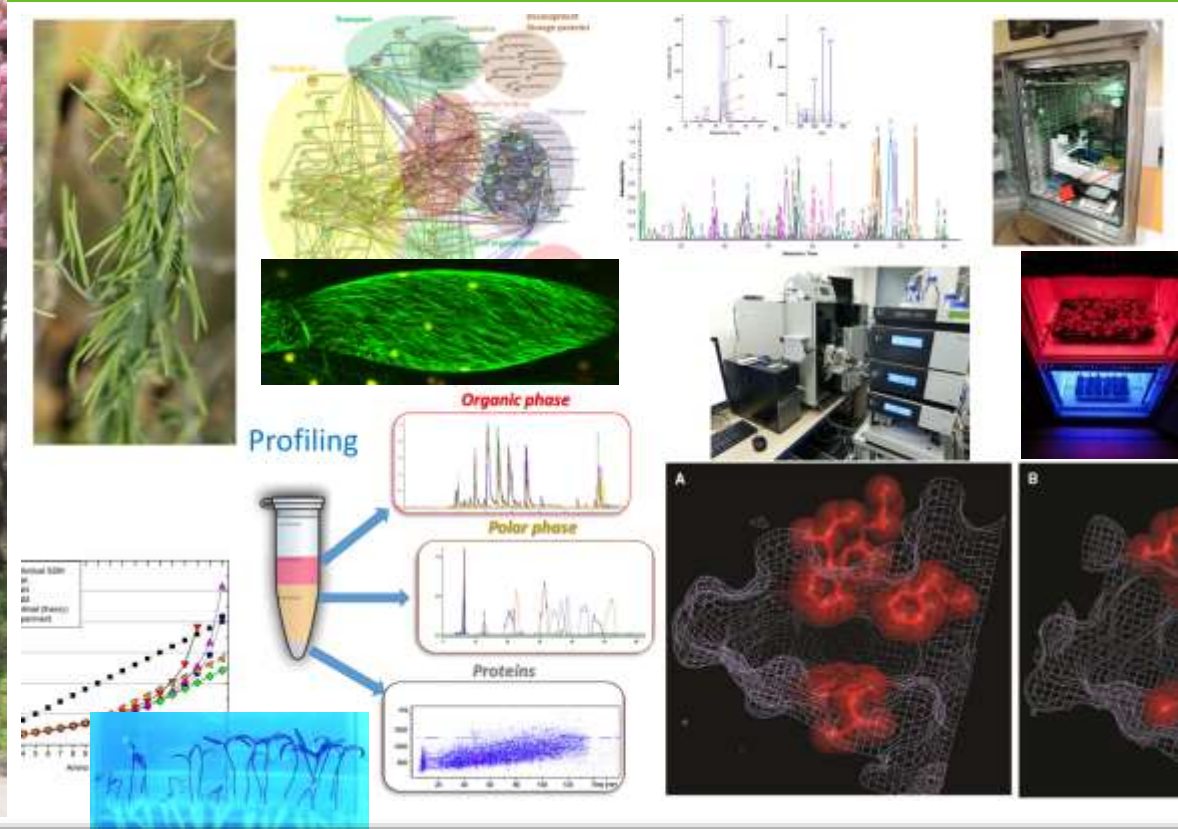


Případné téma BP bude vypsáno v systému až po předběžné domluvě, pokud vás některé téma zaujalo, napište mi:

martincerny83@gmail.com

[Department of Molecular Biology and Radiobiology](#)

umbr.af.mendelu.cz



Developmental and Production Biology – Omics Approaches

Martin Černý

Who are we?

MENDEL UNIVERSITY IN BRNO



225 Department of Molecular Biology and Radiobiology

 CEITEC Developmental and Production Biology – Omics Approaches



Prof. RNDr. Břetislav Brzobohatý, CSc.

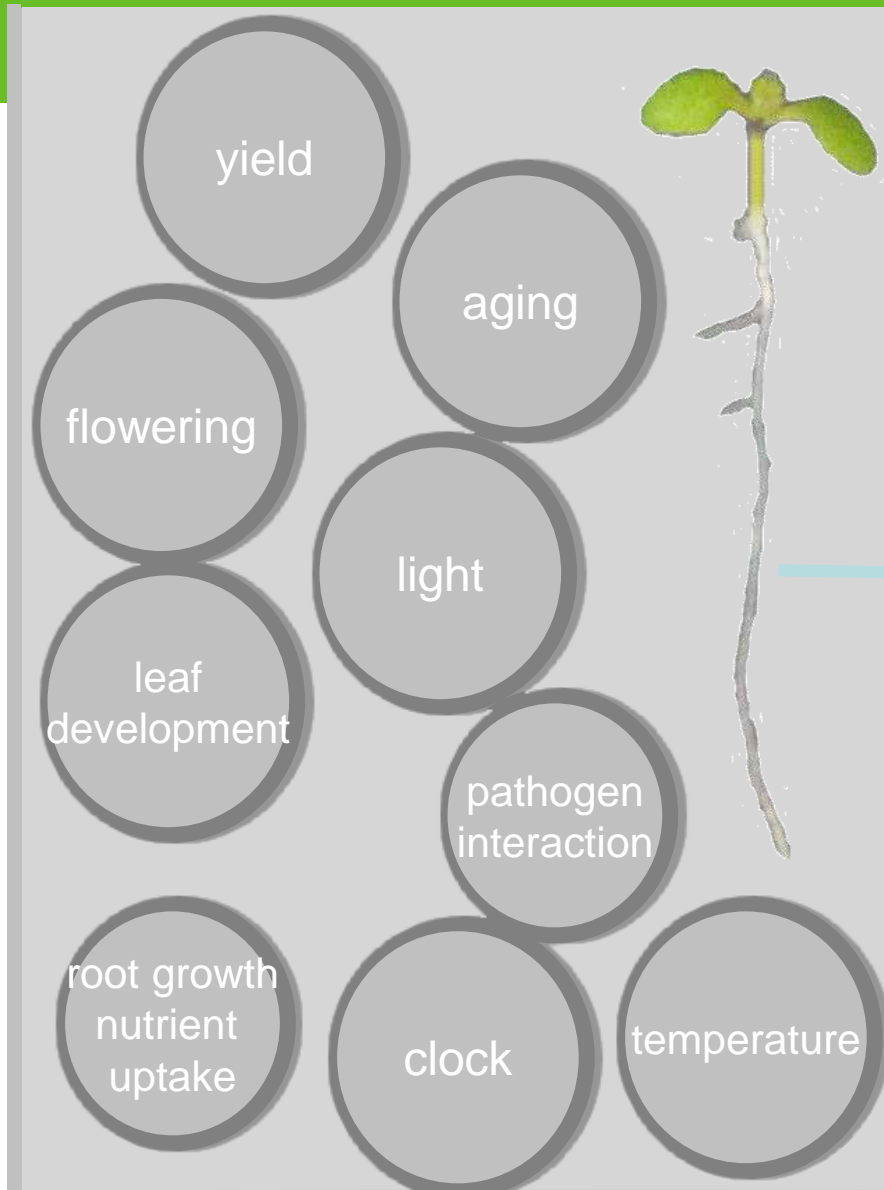
- 6 postdocs
- 6 PhD students
- 6 graduate students
- 14+ pregraduate students
- 2 technicians

- Plant molecular physiology&Radiobiology
- **Proteomics&Metabolomics**
- Structural biology

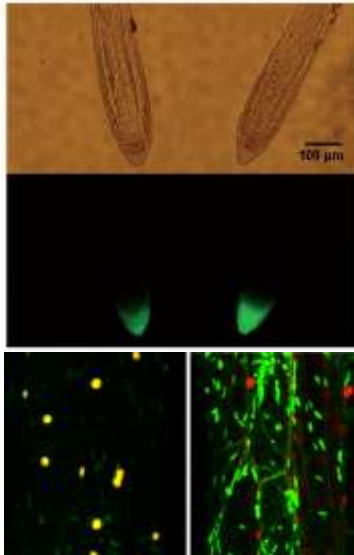
<http://umbr.af.mendelu.cz>

Omics group

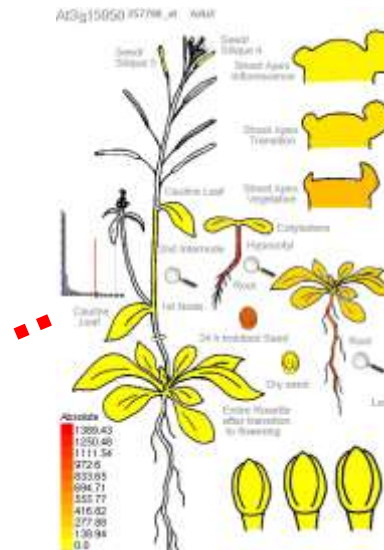
MENDEL UNIVERSITY IN BRNO



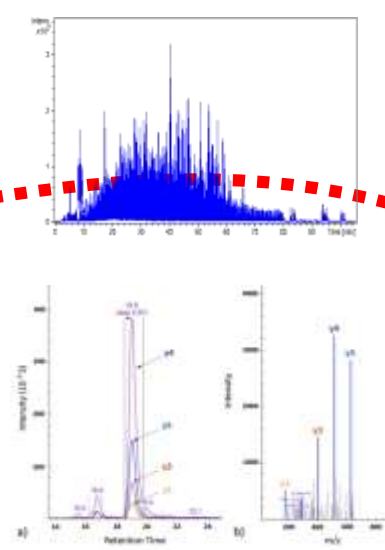
microscopy



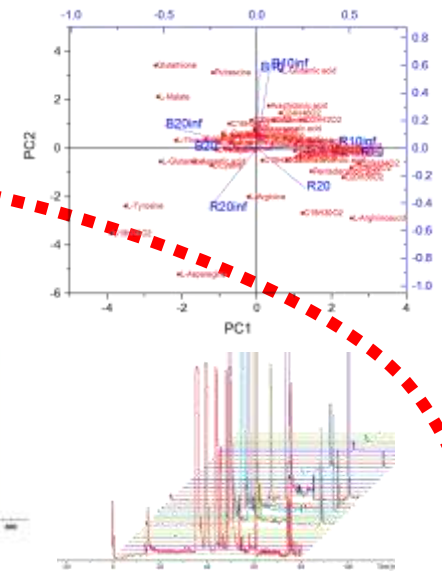
RT-qPCR



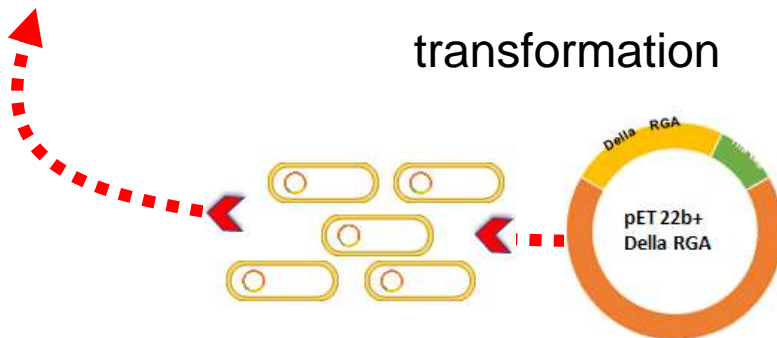
proteomics



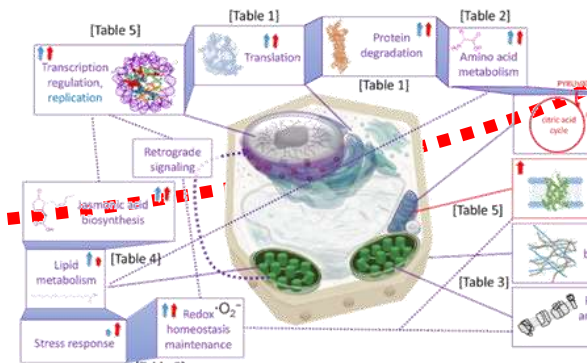
metabolomics



transformation



bioinformatics

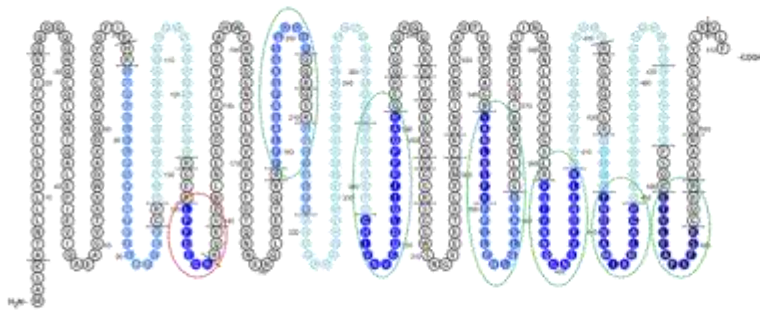
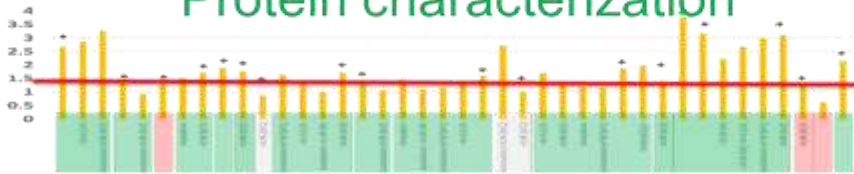


Omics analyses

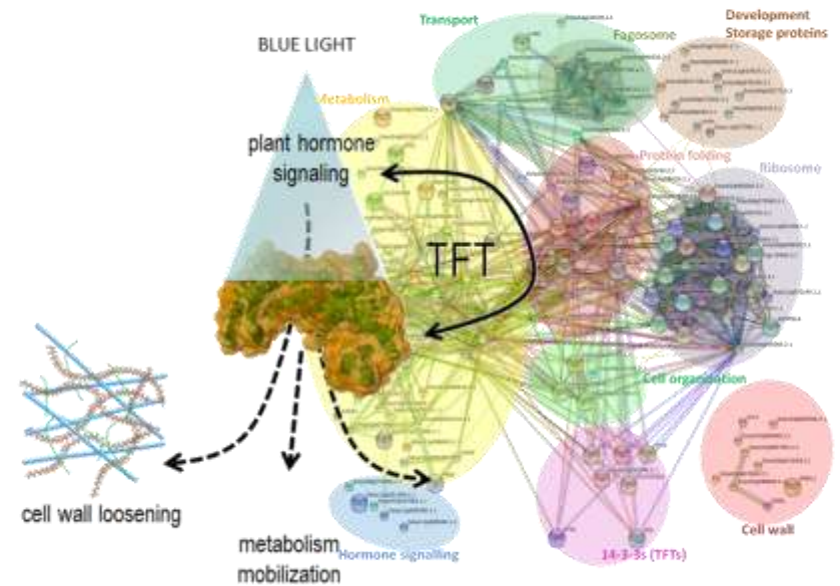
MENDEL UNIVERSITY IN BRNO



Protein characterization



Protein-protein interactions, signaling



Our LC-MS

MENDEL UNIVERSITY IN BRNO



maXis impact UHR-TOF



- Proteome profiling
- Relative and absolute protein quantification
- Metabolome profiling

amaZon speed ETD ion trap



- Detection of PTMs



TSQ Quantiva triple quadrupole MS



- Targeted analyses
- ag sensitivity

Nanomate



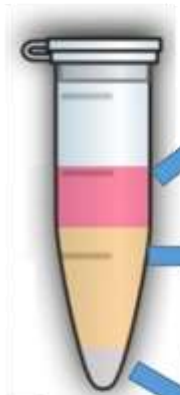
- Protein-ligand interaction
- LESA

Q Exactive GC Orbitrap

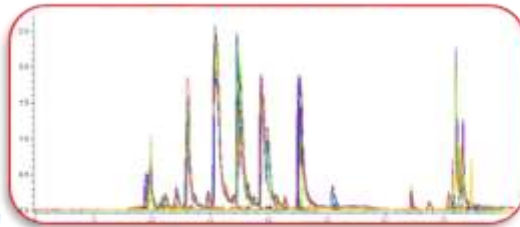
MENDEL UNIVERSITY IN BRNO



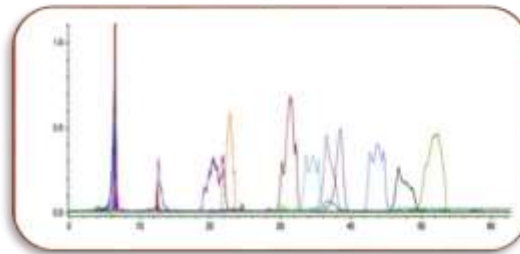
Profiling



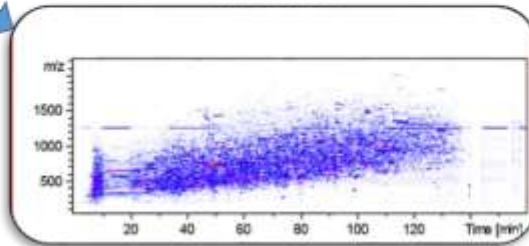
Organic phase



Polar phase



Proteins



5/2017

Topics

MENDEL UNIVERSITY IN BRNO



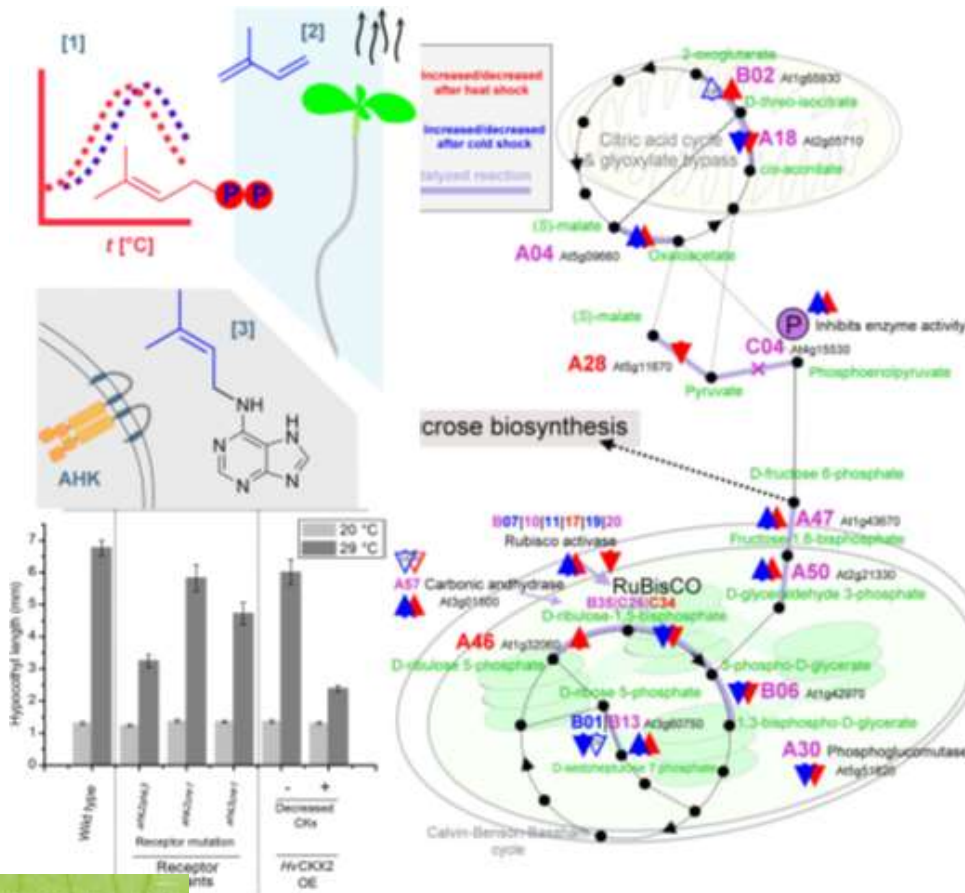
- Abiotic interactions
 - Temperature perception
 - Light quality, intensity, photoperiod

- Biotic interactions
 - *Phytophthora*
 - Club root disease

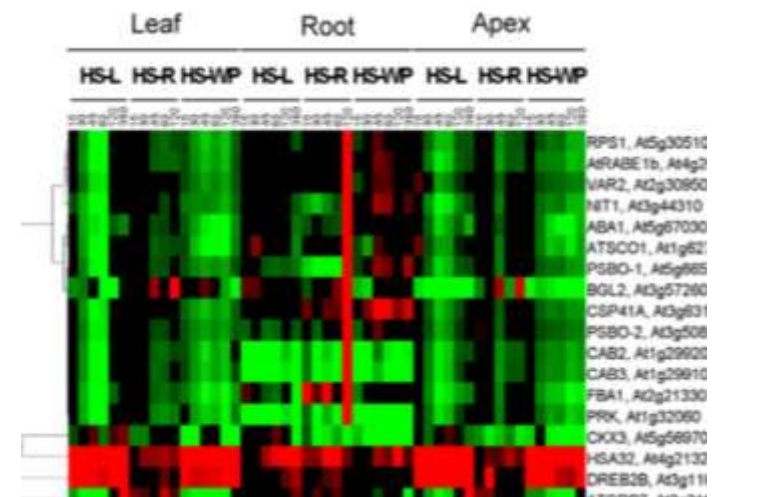
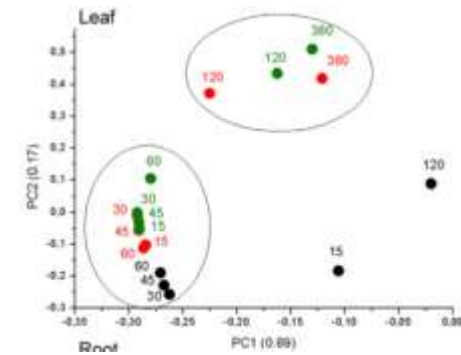
- Molecular processes and growth regulation
 - UPS
 - Phytohormones, growth regulators

Abiotic interactions: Cytokinin and temperature

MENDEL UNIVERSITY IN BRNO



“The impact of heat stress targeting on the hormonal and transcriptomic response in Arabidopsis”

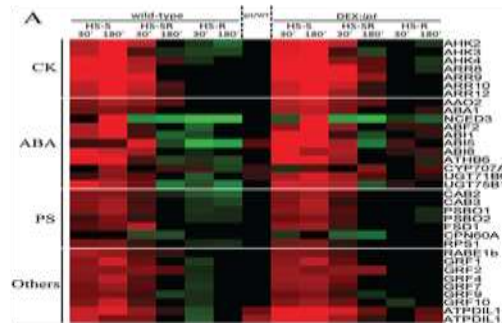
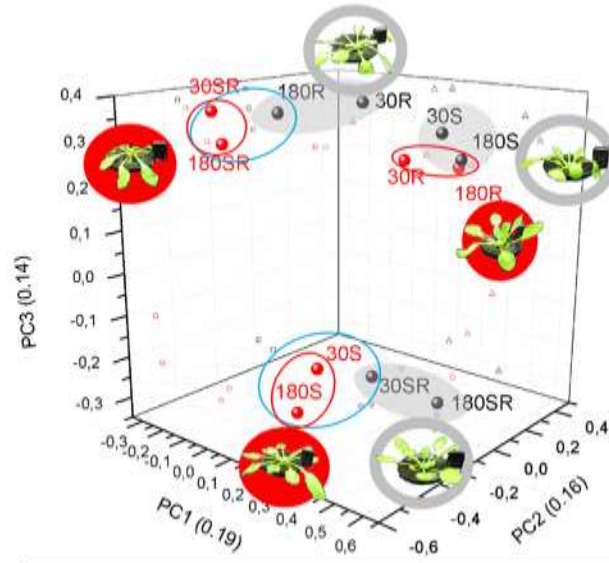
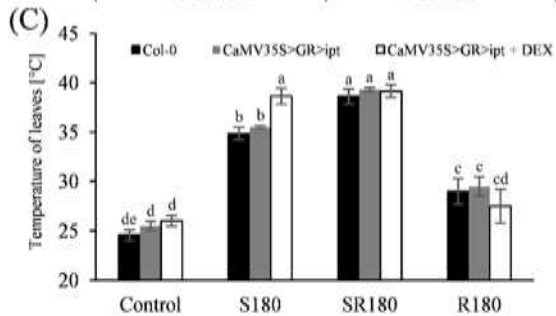
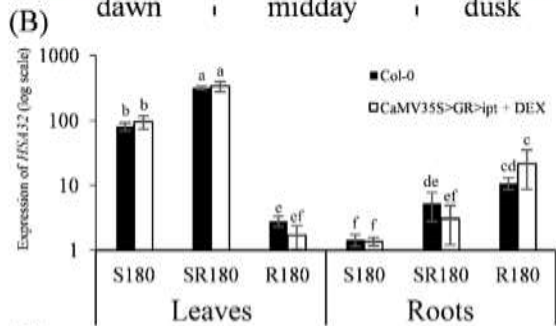
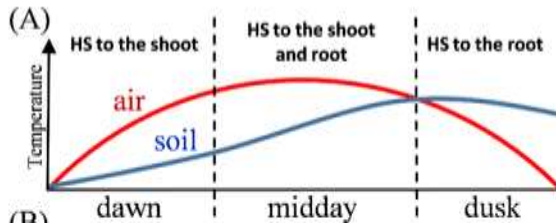


“Cytokinin modulates proteomic, transcriptomic and growth responses to temperature shocks in Arabidopsis”

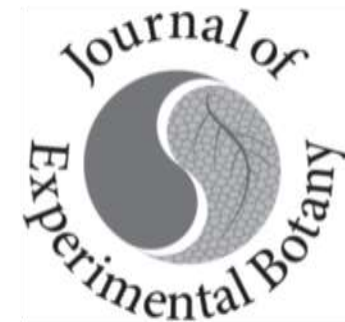


Abiotic interactions: Cytokinin and temperature

MENDEL UNIVERSITY IN BRNO



Skalák J, Černý M, Jedelský P, Dobrá J, Ge E, Novák J, Hronková M, Vaňková R, Brzobohatý B



Vol. 67, No. 9 pp. 2861–2873, 2016

Phytohormone cytokinin stimulates transpiration and moderates a longer term negative effects of a heat stress via modulations on transcriptome and proteome level.

Abiotic interactions: Cytokinin and temperature

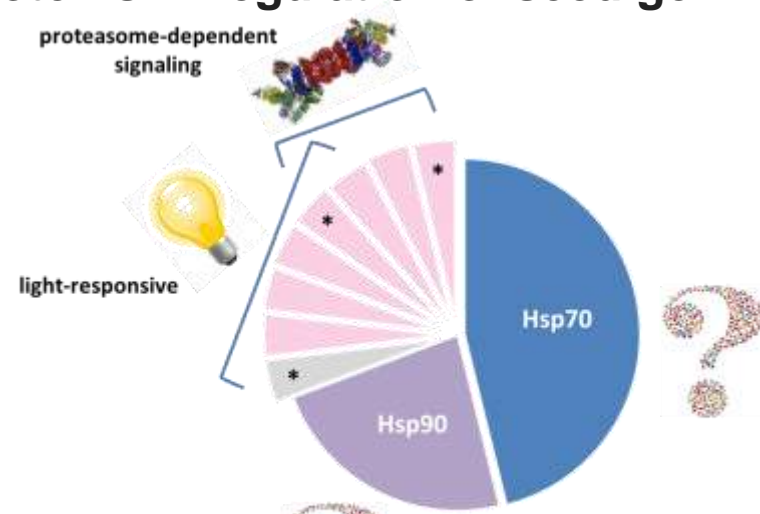
2017-2019 GACR 17-04607S – Interaction between light and cytokinin



Institute of
Experimental
Botany AS CR

RNDr. Radomíra Vaňková, CSc.

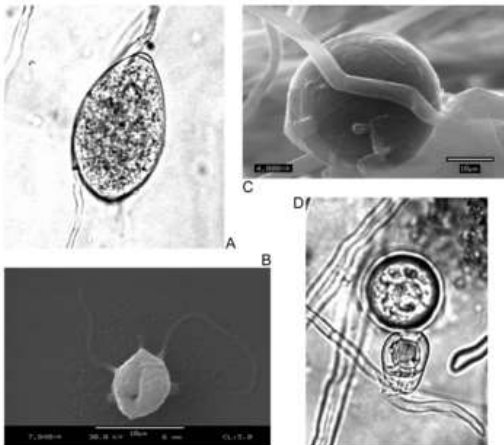
2017-2019 – PhD Talent – Role of HSP proteins in regulation of seed germination



Ing. Hana Habánová

Phytophthora

MENDEL UNIVERSITY IN BRNO



2016-2022



Plant signaling: Biotic and abiotic interactions

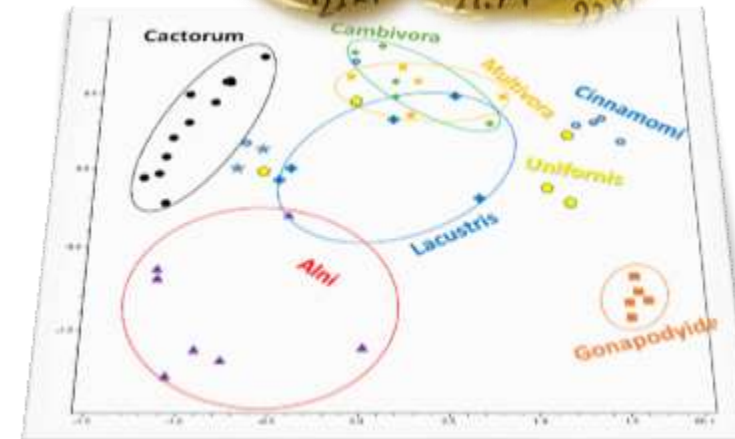
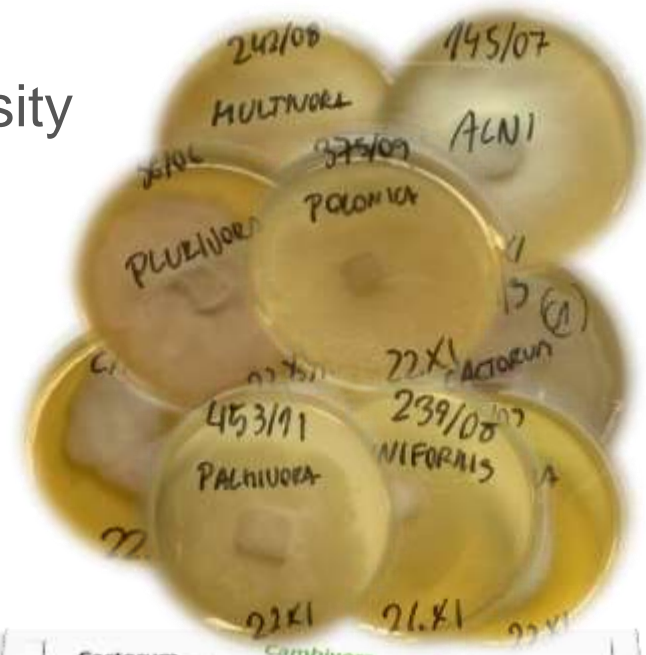
MENDEL UNIVERSITY IN BRNO



- New joint research centre at Mendel University

Our role:

- Comparative analysis of Phytophthora infection
- Plant hormones in Phytophthora infection
- Abiotic stress and Phytophthora infection



Club root disease

MENDEL UNIVERSITY IN BRNO



Laboratory of Plant Molecular Biology, Phytophthora Research Centre and CEITEC - Central European Institute of Technology, Mendel University in Brno would like to invite you to the lecture by **Prof. Dr. Jutta Ludwig-Müller**:

Plant defense responses from a root's perspective

10th May 2016, 1 p.m.

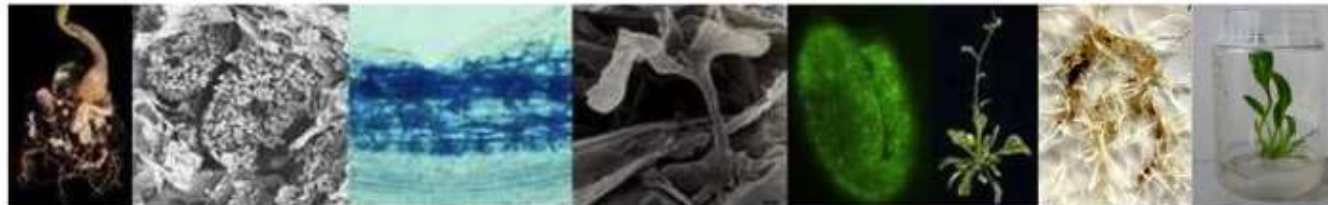
Mendel University in Brno, building M, room 2.12

Space is limited, please, **REGISTER**



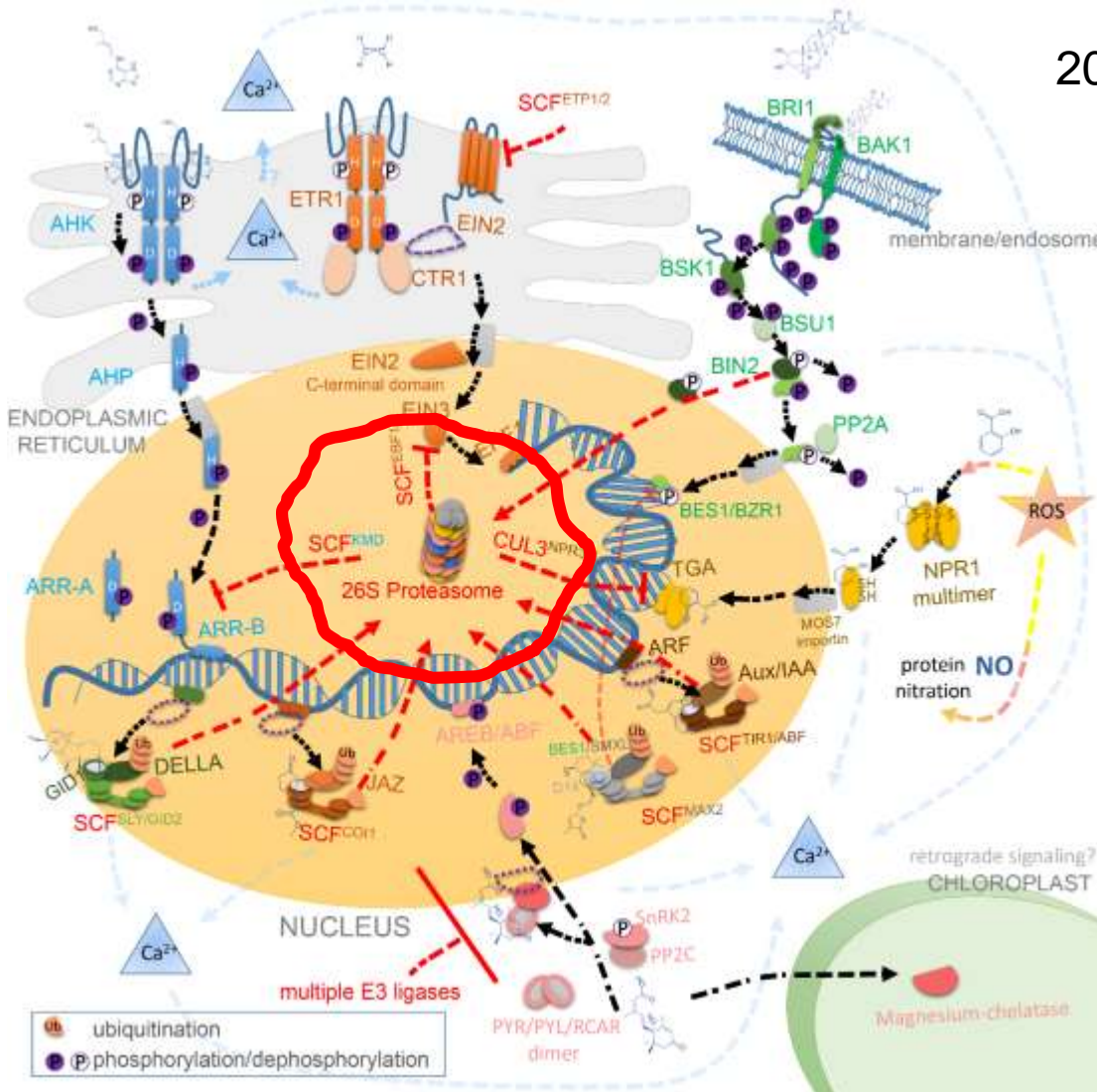
*Prof. Dr. phil. nat. habil.
Jutta Ludwig-Müller*

Jutta Ludwig-Müller is a full professor and the director of the **Institute of Botany at the Technische Universität Dresden (TUD)**. Her main research interests include interactions between plants and pathogens/endophytes, phytohormones, their metabolism and role during plants' development and in pathogenic/symbiotic interactions, and secondary plant metabolites. She obtained her PhD from the J.W. Goethe Universität Frankfurt/Main (JWGU), where she studied auxin biosynthesis and the role of auxins during the clubroot disease. Dr. Ludwig-Müller was appointed Assistant Professor at the JWGU in 1994. Five years later, she received a professorship in Plant Physiology at the TUD and she has been heading up the Institute of Botany there since 2001. She has published more than 170 scientific papers and her research has been cited more than 4,600 times.



UPS in plant signaling

2017-2018 7AMB17AT027:
 „Targeted protein degradation in response to a plant hormone cytokinin“.



Andreas Bachmair



Plant-plant interactions

MENDEL UNIVERSITY IN BRNO



- Stress response propagation
- Volatile compounds

CEITEC 2020

TE02000177 - Centrum pro inovativní využití a posílení konkurenceschopnosti českých pivovarských surovin a výrobků (2014-2019, TA0/TE)

Techniques development and optimization

MENDEL UNIVERSITY IN BRNO



- Peptide libraries for targeted protein identification and quantitation

- Targeted Metabolomics

