
Laboratory of Plant Biochemistry

"Our main goal is elucidating rearrangements of metabolic pathways during abiotic and biotic stress in plants."

Offer

We offer our expertise, as well as consultancy or collaboration within a diverse range of plant biochemistry and biotechnology.

- Enzyme assays
- Enzyme kinetics
- Inhibition studies
- Determination of antioxidant capacity
- Electrophoretic separations of enzymes
- Immunochemical assays, ELISA, Western blot

Know-how & Technologies

Applications of Stress Factors and Their Quantifications

- Biotic stress caused by *Potato virus Y*, tobacco mosaic virus (virus quantification – ELISA, Western blot, qPCR)
- Salt stress (atomic absorption spectrometry)
- Drought stress (relative water content)
- Phytoremediation of pharmaceuticals
- Nutrition, organic source of N (analysis of medium composition and enzyme activities)
- Heat stress (Heat shock protein quantification)

Time Course of Stress Treatment

- Physiological and photosynthetic parameters
- Enzyme activities: NADP-dependent enzymes, Hatch-Slack cycle enzymes, enzymes of N, C metabolism (NR, GS, GOGAT, GDH, glycosidases, α -fructosidase, amylase, cellulase, chitinase, β -1,3 glucanase), Antioxidant enzymes (SOD, peroxidases, catalase, glutathione reductase)

Enzyme Isolation and Characterization, Inhibition Studies

- NADP-malic enzyme
- Phosphoenolpyruvate carboxylase
- β -hexosaminidase
- Shikimate dehydrogenase
- Alcohol dehydrogenase
- Lactate dehydrogenase

Content of Research

- Abiotic plant stress (drought, salinity, xenobiotics, high temperature)
- Biotic plant stress (viral infection)
- Plant nutrition, organic sources of nitrogen
- Biological control agents for sustainable agriculture
- Screening of antioxidant activities in plants

Main Capabilities

- Plant Biochemistry
- Enzymology
- Stress markers
- Plant nutrition and *in vitro* cultivation

Key Research Equipment

- Spectrophotometer UV-VIS Helios alpha Thermo Spectronic, USA
- Spectrophotometer UV-VIS Ultrospec 2100 ProBiochrom, UK
- Trans-Blot Turbo Transfer System Bio Rad, USA
- Electrophoretic Separation System, Biometra, Germany
- Microplate Reader Multiskan Go, Thermo Scientific, USA
- Microplate Reader Infinite M200 pro, Tecan, USA
- CFX Connect Real Time Detection System, Bio Rad, USA

Partnerships & Collaborations

Academic Partners

Institute of Experimental Botany Academy of Sciences of the Czech Republic | Institute of Biophysics Academy of Sciences of the Czech Republic | CEITEC — Central European Institute of Technology | Mendel University in Brno | BIOCEV — Biotechnology and Biomedicine Centre of the Academy of Sciences and Charles University | Institute of Organic Chemistry and Biochemistry of the Czech Academy of Science | Hasselt University, Diepenbeek, Belgium

Main Projects

- Technology Agency of the Czech Republic (2018 –2019)
- Ministry of Industry and Trade of the Czech Republic (2017 –2021)
- Innovative Technologies for the Identification and Optimization of the New Generation of Anti-Cancer Drugs (Charles University, UNCE 204025/2012, 2012–2016)
- Innovation voucher (with BARD, s.r.o. 2015)

Achievements

Publications in respected international journals: Plant Science, Biochimie, Journal of Plant Physiology, Food Bioscience, FEBS Journal, Photosynthetica

Are you interested in this expertise?

Please contact CPPT UK

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Experts and their department

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