

Scientific Resume

MSc Katarzyna Czepiel

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Legume Genomics Team

Specialisation plant genetics & biology of lupins, molecular basis of alkaloids synthesis/transport

Research profile

- Ph.D. Student & Research Assistant in Legume Genomics Team (supervisor: prof. dr hab. Wojciech Świącicki; co-supervisor: PhD Magdalena Kroc)
- Research area and scientific interests cover plant biology and genetics, especially of lupin species (narrowed-leafed, white, yellow and Andean lupins), with particular reference to molecular basis of quinolizidine alkaloids' synthesis and accumulation and role of transcriptional regulation in this processes, as well as identification of important agronomic traits based on transcriptomic data

Methods

- gene expression analysis (qPCR)
- basic molecular technics: PCR, electrophoresis, reverse-transcription, restrictive digestion
- nucleic acids isolation, purification, quality checking
- working with NGS databases/ basic NGS tools
- MS Office Package
- plant phenotyping

Education

MSc: biotechnology, specialization plant biotechnology

Department of Biology and Environmental Protection, University of Silesia, Katowice

Thesis title: "Analysis of the expression of genes related to the response to water scarcity in the mapping population obtained from barley varieties with a different response to this stress"

Supervisor: prof. dr hab. Iwona Szarejko

Years: 2013 - 2015

Engagement in national and international grants

International

Grant no: 862862

Project title: Intelligent Collections of Food Legumes Genetic Resources for European Agrofood Systems; **INCREASE**

Role: **investigator**

Coordinator: R. Papa

Crop leader: dr hab. K. Susek/ dr M. Kroc

Duration: 2020 – 2025

National

Ministry of Agriculture and Rural Development

Task No.19

Project title: Narrow-leafed lupin alkaloids: understanding the molecular background of the biosynthesis and seed accumulation process as well as searching for the forms with high alkaloid content in green organs while preserving low seed alkaloid content.

Role: **investigator**

Coordinator: dr M. Kroc

Duration: 2021 – 2027

Polish National Science Centre, **Preludium 7**

Grant No.: 2014/13/N/NZ9/03943

Project title: Expression profiles of QA-related genes and QA content assessment across the organs of narrowed-leafed lupin (*Lupinus angustifolius* L.);

Role: **principal investigator**

Academic supervisor: prof. dr hab. W. Święcicki

Duration: 2017 – 2019

Council of Ministers, Multiannual Program

The resolution No. 222/2015

Project title: Increasing the use of domestic feed protein for the production of high-quality animal products in the conditions of sustainable development'; Task 2.2: 'Identification of genes determining the content of alkaloids as well as establishment and maintenance of generative organs in lupins'.

Role: **investigator**

Coordinator: prof. dr hab. W. Święcicki

Duration: 2016 – 2020

Ministry of Agriculture and Rural Development

Task No. 41

Project title: Identification and inheritance of genes determining resistance to fungal diseases and low content of alkaloids in improving of the utility value of lupines, with particular emphasis on yellow lupin

Role: **investigator**

Coordinator: dr M. Kroc

Duration: 2016 – 2020

Research papers

Czepiel K., Krajewski P., Wilczura P., Bielecka P., Święcicki W., Kroc M. (2021). Expression Profiles of Alkaloid-Related Genes across the Organs of Narrow-Leafed Lupin (*Lupinus angustifolius* L.) and in Response to Anthracnose Infection. *International Journal of Molecular Sciences* 22(5): 2676. DOI: 10.3390/ijms22052676

Kroc M., Tomaszewska M., **Czepiel K.**, Bitocchi E., Oppermann M., Neumann K., Guasch L., Bellucci E., Alseekh S., Graner A., Fernie A. R., Papa R., & Susek K. (2021). Towards development, maintenance, and standardized phenotypic characterization of single-seed-descent genetic resources for lupins. *Current Protocols*, 1, e191. DOI: 10.1002/cpz1.191

Kroc M., **Czepiel K.**, Wilczura P., Mokrzycka M., Święcicki W. (2019). Development and validation of a gene-targeted dCAPS marker for marker-assisted selection of low-alkaloid content in seeds of narrow-leafed lupin (*Lupinus angustifolius* L.). *Genes* 10 (6): 428. DOI: 10.3390/genes10060428

Kroc M., Koczyk G., Kamel K.A., **Czepiel K.**, Fedorowicz-Strońska O., Krajewski P., Kosińska J., Podkowiński J., Wilczura P., Święcicki W. (2019). Transcriptome-derived investigation of biosynthesis of quinolizidine alkaloids in narrow-leafed lupin (*Lupinus angustifolius* L.) highlights candidate genes linked to iucundus locus. *Scientific Reports* 9 (1): 2231. DOI: 10.1038/s41598-018-37701-5

Święcicki W., **Czepiel K.**, Wilczura P., Barzyk P., Kaczmarek Z., Kroc M. (2019). Chromatographic fingerprinting of the Old World Lupins seed alkaloids: A supplemental tool in species discrimination. *Plants* 8 (12):548. DOI: 10.3390/plants8120548