



Laboratory of Molecular Biology and Cytometry

Kaliskiego Ave. 7, 85-796 Bydgoszcz, POLAND

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GROUP LEADER

Prof. Elwira ŚLIWIŃSKA

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Scientific Career:

1981 – Master of Science in Agriculture

1990 – PhD in Agricultural Sciences in the field of Agronomy

2001 – Habilitated Doctor in Agronomy in the field of Genetics and Plant Breeding

2009 – Full Professor of Agricultural Sciences

Professor Elwira Śliwińska is an internationally-recognized specialist in plant biotechnology and seed biology, using mostly flow cytometry and confocal microscopy. She has authored and co-authored over 100 publications in prestigious scientific journals, worked as a Visiting Scientist in the USA and Canada, and held numerous short- and long-term trainings abroad. She closely cooperates with sugar-beet breeders and seed producers. Her team has broad scientific cooperation, both national and international, e.g. with the University of Guelph, Canada, University of Arizona, Tucson, USA, University of Sao Paulo, Brazil, Pavol Jozef Šafárik University in Košice, Slovakia, Suez Canal University Ismailia, Egypt. Professor Śliwińska is also an expert of the European Commission.

GROUP MEMBERS

Monika REWERS, PhD

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Research Team of the Laboratory of Molecular Biology and Cytometry (from left): Prof. Elwira Śliwińska, Agnieszka Łojko MSc, dr. Monika Rewers, dr. Iwona Jędrzejczyk

LEADING RESEARCH TOPICS OF THE GROUP

- Genome size estimation of plants by flow cytometry;
- Ploidy analysis (flow cytometry, chromosome counting);
- Cell cycle and endoreduplication in seeds and plant organs;
- Application of flow cytometry and molecular markers in species identification and taxonomy;
- Cellular and subcellular processes in plants by confocal microscopy and fluorescent proteins;
- *In vitro* micropropagation of plants and their genetic stability assessment;
- Seed biology and treatment for quality improvement.

GENERAL EXPRESSIONS OF INTERESTS

We would like to invite for collaboration in the field of plant flow cytometry, confocal microscopy and molecular biology. We offer highly specialized biotechnological laboratory, equipped with three Partec cytometers and Leica confocal microscope, as well as a qualified and goal-oriented research team.

MAIN ACHIEVEMENTS OF THE GROUP

- Elaboration of markers of seed developmental stages, quality, and germination advancement based on flow cytometric analysis.
- Development of procedures of flow-cytometric estimation of nuclear DNA content in plant species containing staining inhibitors.
- Development of the procedure of genome size estimation using seed tissues.
- Estimation of genome size and ploidy of several dozens of species using flow cytometry.



- Estimation of endoreduplication patterns in seeds and plants at different developmental stages of several species.
- Assessment of genetic stability of *in vitro* micropropagated plants based on the nuclear DNA content and molecular markers.
- Defining embryo regions responsible for the completion of germination in epigeal and hypogeal species using confocal microscopy and flow cytometry.
- Investigation on nuclear dynamic in collet and root hairs using *Arabidopsis thaliana* GFP-transformed lines and root-hair mutants.

5 BEST SELECTED PUBLICATIONS 2012-2016 (Criterion: highest IF journals)

Rewers M., Jędrzejczyk I. 2016. Genetic characterization of *Ocimum* genus using flow cytometry and inter-simple sequence repeat markers. *Industrial Crops and Products* 91: 142-151.

Bzdęga K., Janiak A., Książczy T., Lewandowska A., Gancarek M., Śliwińska E., Tokarska-Guzik B. 2016. A large scale survey of genetic variation and genome evolution within the invasive *Fallopia* complex. *PLoSOne* 11(8): e0161854.

Śliwińska E. Mathur J., Bewley D. 2015. On the relationship between endoreduplication and collet hair initiation and tip growth, as determined using six *Arabidopsis thaliana* root-hair mutants. *Journal of Experimental Botany* 66: 3285-3295.

Rewers M., Śliwińska E. 2014. Endoreduplication in the germinating embryo and young seedling is related to the type of seedling establishment but is not coupled with superoxide radical accumulation. *Journal of Experimental Botany* 65: 4385-4396.

Rewers M., Śliwińska E. 2012. Endoreduplication intensity as a marker of seed developmental stage in the Fabaceae. *Cytometry Part A* 81A: 1067-1075.