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Scientific specialization

Molecular genetics and physiology

Research area

- Molecular and genetic basis of Brassica genome organization, construction of comparative genetic map for *B. oleracea* by using EST clones from the *A. thaliana* genome.;
- comparative analysis of transcription profile of genes involved in ABA signalling pathway within *A. thaliana* and Brassica crop species genomes;
- analysis of basis of drought stress adaptation in barley, *Hordeum vulgare*; identification, isolation and functional characteristics of the selected genes coding calcium binding protein kinases, which are known for their role in drought stress adaptation in rice (*Oryza sativa*) and *Arabidopsis thaliana* species.

Local co-operation

Department of Biotechnology, Institute of Molecular Biology and Biotechnology, Adam Mickiewicz University, Poznan

International cooperation

- Universite de Perpignan/CNRS (France),
- University of California (USA)

Training abroad

Germany, Golm (5.01.-28.02.2006), Max Planck Institute of Molecular Plant Physiology

List of significant publications:

KACZMAREK M., NELSON M.N., COWLING W. (2011) Molecular Mapping of Complex Traits. In Genetics, Genomics and Breeding of Vegetables Brassicas (Sadowski and Kole eds.). CRC Press FL, USA (w druku).

ZIÓŁKOWSKI P. A., BABULA-SKOWROŃSKA D., KACZMAREK M., CIEŚLA A., SADOWSKI J.. (2010) Sekwencjonowanie porównawcze genomów: generowanie markerów genetycznych typu INDEL i SNP. *Biotechnologia* 4:

KACZMAREK M., KOCZYK G., ZIOLKOWSKI P.A., BABULA-SKOWROŃSKA D., SADOWSKI J. (2009) Comparative analysis of the *Brassica oleracea* genetic map and the *Arabidopsis thaliana* genome. *Genome* 52(7):620-33.

BABULA D., KACZMAREK M., ZIÓŁKOWSKI P.A., SADOWSKI J. (2007) *Brassica oleracea*. In: Kole C (ed) *Genome mapping and breeding in plants. Vol 5 Vegetables*. Springer, Heidelberg, Berlin, New York, Tokyo ,pp 227-285.

BABULA D., MISZTAŁ L.H., JAKUBOWICZ M., KACZMAREK M., NOWAK W., SADOWSKI J. (2006). Genes involved in biosynthesis and signalisation of ethylene in *Brassica oleracea* and *Arabidopsis thaliana*: identification and genome comparative mapping of specific gene homologues. *Theor Appl Genet*, 112: 410-420.

ZIOLKOWSKI P.A., KACZMAREK M., BABULA D., SADOWSKI J. (2006). Genome evolution in *Arabidopsis/Brassica*: conservation and divergence of ancient rearranged segments and their breakpoints. *Plant J* 47:63-74.

KACZMAREK M., BABULA D., SADOWSKI J. (2004) Application of the *Arabidopsis thaliana* sequence data in understanding the *Brassica* genome. In: *Understanding the Plant Genome*; ed. J. Sadowski, 133-122.

BABULA D., KACZMAREK M., BARAKAT A., DELSENY M., QUIROS C.F., SADOWSKI J. (2003). Chromosomal mapping of *B. oleracea* based on *Arabidopsis thaliana* ESTs: complexity of the comparative map. *Mol. Genet. Genomics* 268: 656-65

BABULA D., KACZMAREK M., ZIÓŁKOWSKI P., SADOWSKI J. (2001) Genetyczne i fizyczne podstawy organizacji chromosomów u wybranych gatunków z rodziny *Brassicaceae*. "Rośliny oleiste" TomXXII, 315-326

KACZMAREK M., BABULA D. AND SADOWSKI J. (2000) Construction of *Brassica oleracea* RFLP map based on gene probes from *Arabidopsis thaliana* genome. Materiały Międzynarodowej Konferencji MCC 2000-Mendel Centenary Congress. Brno 7-10 marca 2000, 104.

SADOWSKI J., QUIROS C.F., BABULA D., KACZMAREK M., ZIÓŁKOWSKI P.A. (2000). Mapowanie podstawowych genomów w rodzaju *Brassica*. "Rośliny oleiste" Tom XXI, 21-32.

BABULA D., KACZMAREK M., DELSENY M., QUIROS C.F. AND SADOWSKI J. (2000) Construction of a genetic map for *Brassica oleracea* based on ESTs from the *Arabidopsis thaliana* genome. *Acta Horticulturae*, 539: 95-99.

BABULA D., KACZMAREK M., ZIÓŁKOWSKI P.A. AND SADOWSKI J. (1999) Application of chromosomal map and gene probes of *Arabidopsis* in studies on *Brassica* genomes. NATO Science Series, Series A: Life Sciences, edited by Geza Hrazdina, 319: 70-75.

Participation in national projects

Project of the State Committee for Scientific Research no. 5 PO6A 016 11.: „*Brassica oleracea* L. genome mapping based on DNA markers from *Arabidopsis thaliana* chromosome fourth”, 1996-1999

Project of the State Committee for Scientific Research no. 6 P06A 009 21. „Analysis of organization of *Brassica oleracea* L. chromosomes based on known *Arabidopsis thaliana* genetic probes and genome map.”, 2001-2003

Project of the State Committee for Scientific Research no. 029/P06/0.10. „Chromosome mapping of genes resistant to abiotic and biotic stresses in *Brassica* crop species.”, 2001-2004

Project of the Ministry of Sciences and Higher Education no. 2 P06A 035 28: „Consolidation of genetic map for genome C of the *Brassica* crop species (*Brassica oleracea* L.)”, 2005-2007

Project of the Ministry of Sciences and Higher Education no. PBZ-MNiSW-2/3/2006/19, New molecular genetics and genomics methods to improve crop species, Evaluation and modification of drought stress adaptative properties of winter rape (*Brassica napus* var. *oleifera* L.) using functional genomic methods, 2007-2011

Operating programme Inovative Economy 2007-2013, Priority Axis 1.3.1, POLAPGEN-BD „Biotechnology tools in improving drought resistance in cereal crops” nr UDA-POIG.01.03.01-101/08-00,

„Characterization of expression profile of genes coding calcium binding protein kinases involved in drought stress adaptation in cereal crops.” 2010-2014,