

Dr Michał Książkiewicz

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Field of specialization:

molecular genetics and structural genomics of plants

Research achievements:

- Screening of *L. angustifolius* BAC library for clones containing the sequences of genetic markers linked to the resistance traits: anthracnose, lupin rust and Phomopsis stem blight, followed by restriction fingerprinting and contig construction,
- Functional annotation of BAC-end sequences obtained for clones selected from BAC library,
- Design and genetic mapping in *L. angustifolius* genome of SSR markers containing *Medicago truncatula* introns, STS markers based on BAC-end sequences and RCT1 locus carrying *M. truncatula* anthracnose resistance gene,

National cooperation:

- Prof. dr hab. Cezary Mądrzak, dr Dorota Narożna, Dept. of Biochemistry and Biotechnology, Faculty of Agriculture, University of Life Sciences in Poznań. Selection of BAC clones carrying genes from phenylpropanoid pathway and mapping of these genes in *L. angustifolius* genome.
- Dr Jan Podkowiński, Institute of Bioorganic Chemistry, Polish Academy of Sciences in Poznań. Identification and description of genes participating in diazotrophic symbiosis and genes encoding ACC.
- Prof. dr hab. Wojciech Karłowski, Institute of Molecular Biology and Biotechnology, Faculty of Biology Adam Mickiewicz University in Poznań. Functional annotation of BAC-end sequences obtained for clones selected from *L. angustifolius* BAC library.

International cooperation:

- Dr Hu'an Yang, Department of Agriculture and Food Western Australia, Perth, Australia. Exchange of plant materials (seeds of cultivars, parental lines, and mapping population of the narrow-leafed lupin) and information on sequence of markers linked to selected traits.
- Dr Matthew Nelson, University of Western Australia Perth, Australia. Construction of *L. angustifolius* genetic map with STS markers and analysis of synteny between *L. angustifolius* and *M. truncatula* genomes.
- Dr Kader Ainouche UMR CNRS ECOBIO 6553, EGS, University of Rennes-1, France. Comparative analysis of homologous regions carrying SymRK gene.

Scientific courses:

- Biological Research Institute (BRC), Szeged, Hungary. „Practical application of *CeI* enzyme for genotyping plant individuals”, 1 tydzień (2004).
- Department of Agriculture and Food Western Australia, Australia, Perth. „Molecular marker development and implementation in lupin breeding”, 2 tygodnie (2008).

Research projects financed from national resources:

- Ministry of Science and Higher Education research grant No. N301 084 32/3234 “Analysis of structure of *Lupinus angustifolius* genome region carrying anthracnose resistance gene” 2007-2010, investigator
- Ministry of Science and Higher Education research grant No. PBZ-MNiSW-2/3/2006/3 “Identification of molecular markers linked to gene conferring resistance to pathogenic fungi *Diaporthe toxica* causing Phomopsis stem blight in narrow-leafed lupin (*Lupinus angustifolius* L.)” 2007-2010, investigator
- Ministry of Science and Higher Education doctoral dissertation grant No. N N301 165635 “Structure and organization of genome region determining anthracnose resistance in narrow-leafed lupin (*Lupinus angustifolius* L.)” 2008-2010, principle investigator
- Ministry of Science and Higher Education research grant No. N N301 391939 “Nuclear genome of *Lupinus angustifolius* L.: structure and genetic and physical localization of selected genes and comparative analysis of selected genome regions in legume plant species” 2010-2013, investigator
- Ministry of Agriculture and Rural Development task No. 86 “Molecular markers linked with domesticated traits for genotype characterization of narrow-leafed lupin (*Lupinus angustifolius* L.)” 2010, investigator
- Ministry of Agriculture and Rural Development task “Early flowering trait in narrow-leafed lupin (*Lupinus angustifolius*) – genetic and molecular background” 2011, investigator

Selected publications and conference presentations:

- Lesniewska K., Książkiewicz M., Nelson M.N., Mahé F., Ainouche A., Wolko B., Naganowska B., 2010. Assignment of 3 Genetic Linkage Groups to 3 Chromosomes of Narrow-Leafed Lupin. *Journal of Heredity* 102(2): 228-236.
- Książkiewicz M., Wolko B., 2010. Structure of *L. angustifolius* genome regions involved in resistance to pathogenic fungi. Abstracts 5th International Congress on Legume Genetics and Genomics, July 2-8, Pacific Grove, USA, str. 156.
- Książkiewicz M., Leśniewska K., Mahé F., Naganowska B., Misset M.-T., Ainouche A., Wolko B., 2009. Nodulation *SymRK*-gene region in the narrow leafed lupin genome: localization, structure and annotation. Abstracts 4th Conference of Polish Society of Experimental Plant Biology "Experimental Plant Biology. Why not?!", September 21-25, Cracow, Poland. *Acta Biologica Cracoviensia* Vol. 51 suppl. 2, str. 79.
- Mahé F., Leśniewska K., Książkiewicz M., Naganowska B., Misset M.-T., Wolko B., Ainouche A., 2009. Legume Genomics: Comparative analysis of the *SymRK* region among representatives of different papilionoid lineages. Abstracts International Meeting "Evolutionary biology: Phylogenetics, Speciation, Co-Evolution, Development, Genomes, Life Histories, Plasticity... What is new?" June 8 -12, University of Rennes-1, Rennes, Brittany, str. 46.
- Książkiewicz M., Karlowski W., Yang H., Wolko B., 2008. Physical and genetic analysis of genome region conferring the resistance to fungal pathogens in narrow-leafed lupin. W: Palta J.A., Berger J.B. (red.) *Lupins for Health and Wealth*. Proc. 12th Int. Lupin Conf., 14-18 Sept., Fremantle, Western Australia. ISBN 0-86476-153-8. International Lupin Association, Canterbury, New Zealand, str. 263-266.
- Książkiewicz M., Wolko B., Kasprzak A., 2007. Sekwencjonowanie regionu genomu łąbinu wąskolistnego warunkującego odporność na antraknozę. Streszczenia II Polski Kongres Genetyki. 18-20 września, Warszawa, str. 88.
- Wolko B., Książkiewicz M., Kasprzak A., 2007. Physical mapping of the *Lupinus angustifolius* genome region containing resistance genes to fungi pathogens. Abstracts 6th European Conference on Grain Legumes "Integrating legumes biology for sustainable agriculture". 12-16 November, Lisbon (Portugal), str.158.
- Książkiewicz M., Wolko B., 2006. Analiza struktury i organizacji regionu genomu warunkującego odporność na patogeny grzybowe u łąbinu wąskolistnego. Program i streszczenia prezentacji. Warsztaty Naukowe Polskiego Towarzystwa Łubinowego „Strategie wykorzystania roślin strączkowych”. 25-27 września, Zakopane, str. 24.
- Wolko B., Kasprzak A., Książkiewicz M., 2006. Searching for Clones Containing Disease Resistance Genes in the *Lupinus angustifolius* Nuclear Genome BAC Library. 3rd International Conference on Legume Genomics & Genetics. 9-13 kwietnia, Brisbane, Australia, str. 97.
- Nelson M.N., Phan H.T.T., Ellwood S.R., Moolhuijzen P.M., Hane J., Williams A., O’Lone C.E., Fosu-Nyarko J., Scobie M., Cakir M., Jones M.G.K., Bellgard M., Książkiewicz M., Wolko B., Barker S.J., Oliver R.P., Cowling W.A., 2006. The first gene-based map of *Lupinus angustifolius* L. - location of domestication genes and conserved synteny with *Medicago truncatula*. *Theoretical and Applied Genetics* 113(2):225-238.
- Wolko B., Boersma J., Yang H., Książkiewicz M., Susek K., Chudy M., Gawłowska M., Świącicki W.K., 2005. Molecular markers for lupin genome mapping developed on the basis of *Medicago truncatula* and *Pisum sativum* sequence databases. W: van Santen E. and Hill G.D. (red.) *Mexico, Where Old and New World Lupins Meet*. Proc. 11th Int. Lupin Conf., May 4-9, Guadalajara, Mexico. ISBN 0-86476-165-1. International Lupin Association, Canterbury, New Zealand, str. 52-56.