

## Karolina Michalska, PhD - Curriculum Vitae

Midwest Center for Structural Genomics  
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### Education

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| 2002-2007 | PhD at Faculty of Chemistry, Adam Mickiewicz University<br>Poznań, Poland<br>Thesis: Crystallographic and biochemical studies of<br>amidohydrolases (in Polish)<br>Supervisor: prof. Mariusz Jaskólski |
| 1997-2002 | MSc at Faculty of Chemistry, Adam Mickiewicz University<br>Poznań, Poland<br>Thesis: Kinetic studies of yellow lupine asparaginase (in Polish),<br>Supervisor: prof. Mariusz Jaskólski                 |

### Employment

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| Since April 2010 | Postdoctoral appointee at Midwest Center for Structural Genomics,<br>Argonne National Laboratory |
| 2009-2010        | Research associate at Faculty of Chemistry, Adam Mickiewicz<br>University                        |

### Additional courses:

- „Fundamentals of modern methods in biocrystallography”, Oeiras, Portugal, 10-19 October 2002
- „The Birkbeck College Advanced Certificate in Protein Crystallography on the Web”, 2002/2003
- „From gene to drug”, Trieste, Italy, 8-11 September 2003
- „Evolving methods in macromolecular crystallography”, Erice, Italy, 12-22 May 2005

### Grants and awards:

Principal researcher in the project “Crystallographic and biochemical studies of amidohydrolases” (No 2P04A04029) sponsored by the Ministry of Science and Higher Education

Principal investigator in the project „Plant hormones binding by PR-10 proteins” ( N N301 003739) sponsored by the Ministry of Science and Higher Education

MAXIMA CUM LAUDE diploma for the best graduates, Department of Chemistry, Adam Mickiewicz University, 2002

Polish Biochemical Society J.K.Parnas' Prize for the best biochemical research carried out in a Polish laboratory and published in 2005 for publication "Crystal structure of isoaspartyl aminopeptidase in complex with L-aspartate" *J. Biol. Chem.* 280, 28484-28491.

5<sup>th</sup> place for “Crystal structure of plant asparaginase”. *J. Mol. Biol.* 360, 105-116. In the Polish Society of Experimental Plant Biology competition for the best experimental publication 2005-2006

MARRESEARCH award for a young woman scientist at 24<sup>th</sup> European Crystallographic Meeting ECM24 for poster “Crystallographic studies of an active-site mutant of plant-type L-asparaginase”.

Young Scientist Scholarship awarded by the city of Poznań, 2008

START stipend for young researchers funded by the Foundation for Polish Science, 2010

### Publications:

1. **K. Michalska**, K. Tan, H. Li, C. Hatzos-Skintges, Jessica Bearden, G. Babnigg, Andrzej Joachimiak (2012) GH1 family 6-P- $\beta$ -glucosidases from human microbiome lactic acid bacteria. *Acta Cryst. D*, accepted
2. **K. Michalska**, C. Chang, J.C. Mack, S. Zerbs, A. Joachimiak, F.R. Collart (2012) Characterization of transport proteins for aromatic compounds derived from lignin: benzoate derivative binding proteins. *J. Mol. Biol.* 423(4):555-75
3. P. Drozdal, **K. Michalska**, R. Kierzek, L. Lomozik, M. Jaskolski (2012) Structure of an RNA/DNA dodecamer corresponding to the HIV-1 polypurine tract at 1.6 Å resolution *Acta Cryst. D* **68**, 169-175
4. A. Kryshtafovych, J. Moulton, S.G. Bartual, J.F. Bazan, H. Berman, D.E. Casteel, E. Christodoulou, J.K. Everett, J. Hausmann, T. Heidebrecht, T. Hills, R. Hui, J.F. Hunt, J. Seetharaman, A. Joachimiak, M.A. Kennedy, C. Kim, A. Lingel, **K. Michalska**, G.T. Montelione, J.M. Otero, A. Perrakis, J.C. Pizarro, M.J. van Raaij, T.A. Ramelot, F. Rousseau, L. Tong, A.K. Wernimont, J. Young, T. Schwede (2011) Target highlights in CASP9: Experimental target structures for the critical assessment of techniques for protein structure prediction. *Proteins*. 79 Suppl 10:6-20.
5. **K. Michalska**, M.E. Cuff, C. Tesar, B. Feldmann, A. Joachimiak (2011) Structure of 2-oxo-3-deoxygalactonate kinase from *Klebsiella pneumoniae*. *Acta Cryst. D* **67**, 678-89.
6. R. Kolodziejczyk, **K. Michalska**, A. Hernandez-Santoyo, M. Wahlbom, A. Grubb, M. Jaskolski, (2010) Crystal structure of human cystatin C stabilized against amyloid formation. *FEBS J.*, **277**, 1726-37.
7. **K. Michalska**, H. Fernandes M. Sikorski, M. Jaskolski (2010) Crystal structure of Hyp-1, a St. John's wort protein implicated in the biosynthesis of hypericin. *J. Struct. Biol.* **169**, 161-171.
8. **K. Michalska**, A. Hernandez-Santoyo, M. Jaskolski (2008), The mechanism of autocatalytic activation of plant-type L-asparaginases. *J. Biol. Chem.* **283**, 13388-13397.
9. **K. Michalska**, D. Borek, A. Hernandez-Santoyo, M. Jaskolski, (2008), Crystal packing of plant-type L-asparaginase from *Escherichia coli*. *Acta Cryst. D* **64**, 309-320.
10. **K. Michalska**, M. Jaskolski, (2006), Structural aspects of L-asparaginases, their friends and relations. *Acta Biochim. Pol.* **53**, 627-640.
11. **K. Michalska**, G. Bujacz, M. Jaskolski, (2006), Crystal structure of plant asparaginase. *J. Mol. Biol.* **360**, 105-116.
12. **K. Michalska**, K. Brzezinski, M. Jaskolski, (2005), Crystal structure of isoaspartyl aminopeptidase in complex with L-aspartate. *J. Biol. Chem.* **280**, 28484-28491.
13. D. Borek, **K. Michalska**, K. Brzezinski, A. Kisiel, J. Podkowinski, D.T. Bonthron, D. Krowarsch, J. Otlewski, M. Jaskolski, (2004), Expression, purification, and catalytic activity of *Lupinus luteus* asparagine  $\beta$ -amidohydrolase and its *Escherichia coli* homolog. *Eur. J. Biochem.* **271**, 3215-3226.

### Posters:

1. R. Jedrzejczak, G. Babnigg, W. Eschenfeldt, L. Stols, **K. Michalska**, A. Joachimiak (2012), High-throughput Ligation Independent Cloning of Protein-Protein complexes. PSI: Biology Technologies Workshop, Bethesda, USA, December 12
2. **K. Michalska**, K. Tan, H. Li, C. Hatzos-Skintges, J. Bearden, G. Babnigg, A. Joachimiak (2012), Recognition of lignin degradation products by ABC transporters. 6th Annual Symposium of The Protein Society, San Diego, USA, August 5-8
1. A. Joachimiak, K. Tan, **K. Michalska**, G. Babnigg (2011), Structures of glycoside hydrolases from human gut microbiome, XXII IUCr Congress, Madrid, Spain, August 22-29
1. **K. Michalska**, K. Tan, C. Hatzos-Skintges, H. Li, J. Bearden, A. Joachimiak (2011), Crystallographic studies of 6-P- $\beta$ -glucosidases from lactic acid bacteria. 25th Anniversary Symposium of The Protein Society, Boston, USA, July 22-27
2. G. Babnigg, K. Tan, C. Chang, **K. Michalska**, M. Cuff, A. Joachimiak (2011), Structural studies of proteins overrepresented in the human gut microbiome. International Human Microbiome Congress, Hyatt Regency Vancouver, USA, March 9-11

3. **K. Michalska**, H. Fernandes, M. Sikorski, M. Jaskolski (2009), Crystal structure of Hyp-1, a putative enzyme from St John's wort involved in the biosynthesis of hypericin. 44<sup>th</sup> Annual Meeting of the Polish Biochemical Society, Lodz, Poland, 16-19, September.
4. M. Bejger, J. Kulej, **K. Michalska**, M. Sikorski, M. Jaskolski (2007), Mutagenesis and expression of an active-site mutant of yellow lupine L-asparaginase. XLII<sup>th</sup> Annual Meeting of the Polish Biochemical Society, Szczecin, Poland, 18-21 September.
5. **K. Michalska**, A. Hernandez-Santoyo, M. Jaskolski (2007), Crystallographic studies of an active-site mutant of plant-type L-asparaginase, 24<sup>th</sup> European Crystallographic Meeting, Marrakech, Morocco, 22-27 August
6. **K. Michalska**, R. Janowski, R. Kolodziejczyk, M. Wahlbom, A. Grubb, M. Jaskolski (2007), Cysteine mutations as a tool for controlling domain swapping of human cystatin C. Cerebral Amyloid Angiopathy – emerging concepts. Reykjavik, Iceland, 8-11 August.
7. **K. Michalska**, G. Bujacz, M. Jaskolski (2006), Crystal structure of plant asparaginase. XLI<sup>th</sup> Annual Meeting of the Polish Biochemical Society, Białystok, Poland, 12-15 September.
8. **K. Michalska**, G. Bujacz, M. Jaskolski (2006), Crystal structure of plant asparaginase. 23<sup>rd</sup> European Crystallographic Meeting, Leuven, Belgium, 6-11 August.
9. **K. Michalska**, M. Jaskolski (2005), Crystal structure of plant asparaginase/isoaspartyl aminopeptidase. 47<sup>th</sup> Polish Crystallographic Meeting, Wrocław, Poland, June 30-July 1.
10. D. Borek, J. Podkowinski, **K. Michalska**, M. Jaskolski (2000), Biochemical and crystallographic studies of *L. luteus* asparaginase. Molecular Architecture of Evolution: Primary and Secondary Determinants, Poznan, Poland, October 29-31.

#### Oral communications:

1. **K. Michalska**, C. Chang, J.C. Mack, S. Zerbs, A. Joachimiak, F.R. Collart (2012), Binding profiles and crystal structures of solute-binding proteins for transport of aromatic products of lignin degradation: benzoate derivative binding proteins. 4th Annual Argonne Soil Metagenomics Meeting, Bloomington, USA, October 3–5
2. A. Joachimiak, K. Tan, **K. Michalska**, G. Babnigg (2012), Structures of glycoside hydrolases from human gut microbiome, High-Throughput Structural Biology, Keystone, USA, January 22-27
3. M. Jaskolski, **K. Michalska**, R. Kolodziejczyk, A. Hernandez-Santoyo, M. Wahlbom, A. Grubb (2008), Structure of monomeric human cystatin C stabilized against 3D domain swapping and amyloid aggregation. The Congress of Biochemistry and Cell Biology, Olsztyn, Poland, 7-11 September.
4. M. Jaskolski, **K. Michalska** (2008), L-Asparaginases, their friends and relations. 17<sup>th</sup> Slovenian Croatian Crystallographic Meeting, Ptuj, Slovenia, 19-22 June.
5. M. Jaskolski, A. Hernandez-Santoyo, **K. Michalska**, M. Wahlbom, A. Grubb (2007), Crystal structure of human cystatin C stabilized against 3D domain swapping. Cerebral Amyloid Angiopathy – emerging concepts. Reykjavik, Iceland, 8-11 August.
6. M. Jaskolski, **K. Michalska** (2006), L-Asparaginases, their friends and relations. Parnas Lecture, XLI<sup>th</sup> Annual Meeting of the Polish Biochemical Society, Białystok, Poland, 12-15 September.
7. M. Jaskolski, **K. Michalska** (2006), Hydrolysis at the side chain of asparagine. Chemistry towards Biology, Cracow, Poland, September 8-12.
8. M. Jaskolski, **K. Michalska**, G. Bujacz (2006), Plant L-asparaginase and its relation to human and bacterial cousins. ACA Annual Meeting, Honolulu, Hawaii, USA, July 22-27.
9. **K. Michalska**, M. Jaskolski (2005), Structure and function of asparagine amidohydrolases. Science and Art in Europe: Symposium on structure and function of RNA and proteins. Berlin, Germany, May 22-25.
10. **K. Michalska**, G. Bujacz, M. Jaskolski (2004), Crystal structure of plant asparaginase. HEC-7, 7<sup>th</sup> Heart of Europe Bio-Crystallography Meeting, Krzyzowa, Poland, September 30-October 2.
11. **K. Michalska**, M. Jaskolski (2004), First glimpses of the structure of plant asparaginase. 1<sup>st</sup> Baltic Sea BioCrystallography Meeting, Luebeck, Germany, September 2-4.
12. **K. Michalska**, K. Brzezinski, M. Jaskolski (2004), Crystal structure of *Escherichia coli* isoaspartyl aminopeptidase in complex with L-aspartate. 46<sup>th</sup> Polish Crystallographic Meeting, Wrocław, Poland, June 24-25.
13. **K. Michalska**, K. Brzezinski, M. Jaskolski (2003), Crystal structure of *Escherichia coli* isoaspartyl aminopeptidase in complex with L-aspartate. HEC-6, 6<sup>th</sup> Heart of Europe Bio-Crystallography Meeting,

Wittenberg, Germany, 25-27 September.

**PDB deposits:**

1JN9 1K2X 2GEZ 2ZAK 2ZAL 3C17 3GAX 3IE5 3OJ0 3OLO 3ON4 3OP9 3OPC 3QOK  
3QOM 3QOO 3QSG 3QSJ 3R1X 3RHT 3RMQ 3RMS 3RRI 3RWS 3RXY 3RXZ 3SHO 3SSF  
3TP9 3TTG 3U2R 4DIM 4EVQ 4EVR 4EVS 4EVU 4EVX 4F66 4F79 4FB7 4GB5 4GBJ  
4GPN 4GYT 4GZE 4H3T 4H3V 4H7L 4I4A 4HN9 4I66

**Professional skills:**

**Molecular biology:** basic knowledge in construct (plasmid) design and site-directed mutagenesis.

**Biochemistry:** protein expression (*E. coli*), purification (affinity, ion-exchange and size-exclusion chromatography), characterization (electrophoresis, mass spectrometry, enzyme kinetics).

**X-ray crystallography:** crystallization, cocrystallization, heavy-atom derivatization, data collection, data processing (DENZO, CCP4), phase determination (molecular replacement, SAD/MAD, MIR), model fitting (XtalView, Coot) and refinement (Refmac, CNS, Phenix.refine, Buster-TNT), structure validation and graphic programs (Pymol, Dino).