**Karolina Michalska, PhD**
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## Education

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| 2002-2007 | PhD, Chemistry, Adam Mickiewicz University, Poznan, Poland |
| 1997-2002 | MSc , Chemistry, Adam Mickiewicz University, Poznań, Poland |

## Employment

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| 2013 – present | Assistant Protein Crystallographer, Biosciences Division, Argonne National Laboratory |
| 2010 - 2013 | Postdoctoral appointee at Midwest Center for Structural Genomics, Biosciences Division, Argonne National Laboratory |
| 2009-2012 | Research associate at Faculty of Chemistry, Adam Mickiewicz University, Poznań, Poland<br>(On the leave 2010-2012) |

## 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

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| 2014 | Principal investigator in the project "Single Cell Structural Genomics of Uncultured Sediment Archaea. On the Trail for Novel Proteases" (2014-108-N0) funded by the Argonne's Laboratory Directed Research & Development grant, 2014 |
| 2010-2013 | Principal investigator in the project „Plant hormones binding by PR-10 proteins" ( N N301 003739) funded by the Ministry of Science and Higher Education |
| 2005-2007 | Principal researcher in the project "Crystallographic and biochemical studies of amidohydrolases" (No 2P04A04029) funded by the Ministry of Science and Higher Education |
| 2010 | START stipend, Foundation for Polish Science |
| 2008 | City of Poznan Young Scientist Scholarship |
| 2007 | MARRESEARCH poster prize at 24$^{th}$ European Crystallographic Meeting ECM24 |

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| 2006 | 5th place in the Polish Society of Experimental Plant Biology competition for the best experimental publication 2005-2006 |
| 2005 | Polish Biochemical Society J.K. Parnas' Prize |
| 2002 | MAXIMA CUM LAUDE diploma, Department of Chemistry, Adam Mickiewicz University |

## Publications

1. **K. Michalska**, A. Steen, G. Chhor, M. Endres, J. Bird, K. Lloyd, A. Joachimiak, Discovery of novel aminopeptidase from "Microbial Dark Matter", in preparation
2. R.S. Weerth, **K. Michalska**, C.A. Bingman, R.M. Yennamalli, H.Li, R. Jedrzejczak, F. Wang, G. Babnigg, A. Joachimiak, M.G. Thomas, G.N. Phillips. Jr. Structure of a cupin protein from *Photorhabdus luminescens* subsp. laumondii TT01 at 1.4 Å resolution, in preparation
3. K. Tan, Y. Kim, C. Hatzos-Skintges, C. Chang, M. Cuff, G. Chhor, J. Osipiuk, **K. Michalska**, B. Nocek, H. An, G. Babnigg, L. Bigelow, G. Joachimiak, H. Li, J. Mack, M. Makowska-Grzyska, N. Maltseva, R. Mulligan, C. Tesar, M. Zhou & A. Joachimiak „Salvage of Failed Protein Targets by Reductive Alkylation". In: Anderson WF, editor. Structural Genomics and Drug Discovery: Springer New York; 2014. p. 189-200.
4. **K. Michalska**, G. Chhor, S. Clancy, R. Jedrzejczak, G. Babnigg, S.C. Winans, et al. "RsaM: a transcriptional regulator of Burkholderia spp. with novel fold". FEBS J., 2014
5. A. Eletsky, **K. Michalska**, S. Houliston, Q. Zhang, M.D. Daily, X. Xu, et al. "Structural and functional characterization of DUF1471 domains of Salmonella proteins SrfN, YdgH/SssB, and YahO". PLoS One, 9(7):e101787, 2014
6. **K. Michalska**, K. Tan, H. Li, C. Hatzos-Skintges, J. Bearden, G. Babnigg, et al. "GH1-family 6-P-beta-glucosidases from human microbiome lactic acid bacteria". Acta Crystallogr., Sect D: Biol. Crystallogr., 69(Pt 3):451-63, 2013
7. **K. Michalska**, R.N. Brown, H. Li, R. Jedrzejczak, G.S. Niemann, F. Heffron, et al. "New sub-family of lysozyme-like proteins shows no catalytic activity: crystallographic and biochemical study of STM3605 protein from Salmonella Typhimurium". J. Struct. Funct. Genomics, 14(1):1-10, 2013
8. H. Fernandes, **K. Michalska**, M. Sikorski, M. Jaskolski. "Structural and functional aspects of PR-10 proteins". FEBS J., 280(5):1169-99, 2013
9. **K. Michalska**, C. Chang, J.C. Mack, S. Zerbs, A. Joachimiak, F.R. Collart. "Characterization of transport proteins for aromatic compounds derived from lignin: benzoate derivative binding proteins". J. Mol. Biol., 423(4):555-75, 2012
10. P. Drozdzal, **K. Michalska**, R. Kierzek, L. Lomozik, M. Jaskolski. "Structure of an RNA/DNA dodecamer corresponding to the HIV-1 polypurine tract at 1.6 A resolution". Acta Crystallogr., Sect D: Biol. Crystallogr., 68(Pt 2):169-75, 2012
11. **K. Michalska**, M.E. Cuff, C. Tesar, B. Feldmann, A. Joachimiak. "Structure of 2-oxo-3-deoxygalactonate kinase from Klebsiella pneumoniae". Acta Crystallogr., Sect D: Biol. Crystallogr., 67(Pt 8):678-89, 2011
12. A. Kryshtafovych, J. Moult, 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, "Target highlights in CASP9: Experimental target structures for the critical assessment of techniques for protein structure prediction". Proteins, 79 Suppl 10:6-20, 2011

13. **K. Michalska**, H. Fernandes, M. Sikorski, M. Jaskolski. "Crystal structure of Hyp-1, a St. John's wort protein implicated in the biosynthesis of hypericin". J. Struct. Biol., 169(2):161-71, 2010
14. R. Kolodziejczyk, K. Michalska, A. Hernandez-Santoyo, M. Wahlbom, A. Grubb, M. Jaskolski. "Crystal structure of human cystatin C stabilized against amyloid formation". FEBS J., 277(7):1726-37, 2010
15. **K. Michalska**, A. Hernandez-Santoyo, M. Jaskolski. "The mechanism of autocatalytic activation of plant-type L-asparaginases". J. Biol. Chem., 283(19):13388-97, 2008
16. **K. Michalska**, D. Borek, A. Hernandez-Santoyo, M. Jaskolski. "Crystal packing of plant-type L-asparaginase from Escherichia coli". Acta Crystallogr., Sect D: Biol. Crystallogr., 64(Pt 3):309-20, 2008
17. **K. Michalska**, M. Jaskolski. "Structural aspects of L-asparaginases, their friends and relations". Acta Biochim. Pol., 53(4):627-40, 2006
18. **K. Michalska**, G. Bujacz, M. Jaskolski. "Crystal structure of plant asparaginase". J. Mol. Biol., 360(1):105-16, 2006
19. **K. Michalska**, K. Brzezinski, M. Jaskolski. "Crystal structure of isoaspartyl aminopeptidase in complex with L-aspartate". J. Biol. Chem., 280(31):28484-91, 2005
20. D. Borek, **K. Michalska**, K. Brzezinski, A. Kisiel, J. Podkowinski, D.T. Bonthron, et al. "Expression, purification and catalytic activity of Lupinus luteus asparagine beta-amidohydrolase and its Escherichia coli homolog". European Journal of Biochemistry / FEBS, 271(15):3215-26, 2004

## Presentations

1. **K**. **Michalska**, A. Steen, G. Chhor, K. Fayman, M. Endres, G. Babnigg, K. Lloyd, R. Jedrzejczak, A. Joachimiak, (2014) Structure and specificity of novel aminopeptidase from marine sediment Archaea. 23rd Congress and General Assembly of the International Union of Crystallography, Montreal, Canada, August 5-13.
2. A. Steen, K. **Michalska K**, G. Chhor, M. Endres , J. Vazin , K. Lloyd, S. Wilhelm, A. Joachimiak, (2014) Strategies to assess the biochemical properties of extracellular hydrolases in aquatic environments, Goldschmidt2014 conference, Sacramento, CA, USA, June 8- 13.
3. **K. Michalska**, A. Steen, G. Chhor, K. Fayman, M. Endres, G.Babnigg, K. Lloyd, R. Jedrzejczak, A. Joachimiak (2014), Structural genomics of sedimentary Archaea in postgenomic era. DOE Joint Genome Institute 9th Annual Genomics of Energy & Environment Meeting, Walnut Creek, CA, USA, March 18-20.
4. **K. Michalska**, A. Steen, G. Chhor, K. Fayman, M. Endres, G.Babnigg, K. Lloyd, R. Jedrzejczak, A. Joachimiak (2013), Discovery of Proteins from “Microbial Dark Matter”, NIH Structural Biology Horizons Workshop, Bethesda, USA, December 9-10.
5. 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.
6. **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.
7. A. Joachimiak, K. Tan, **K. Michalska**, G. Babnigg, Structures of glycoside hydrolases from Human Gut Microbiome. Keystone Symposium: High-Throughput Structural Biology, Keystone, CO, January 22 - 27, 2012
8. **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, Bloomingdale, USA, October 3–5.

9. 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.
10. 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.
11. **K. Michalska**, K. Tan, C. Hatzos-Skintges, H. Li, J. Bearden, A. Joachimiak (2011), Crystallographic studies of 6-P-β-glucosidases from lactic acid bacteria. 25th Anniversary Symposium of The Protein Society, Boston, USA, July 22-27.
12. 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.
13. **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$^{th}$ Annual Meeting of the Polish Biochemical Society, Lodz, Poland, September 16-19.
14. 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, September 7-11.
15. M. Jaskolski, **K. Michalska** (2008), L-Asparaginases, their friends and relations. 17$^{th}$ Slovenian Croatian Crystallographic Meeting, Ptuj, Slovenia, June 19-22.
16. 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, August 8-11.
17. 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$^{th}$ Annual Meeting of the Polish Biochemical Society, Szczecin, Poland, September 18-21.
18. **K. Michalska**, A. Hernandez-Santoyo, M. Jaskolski (2007), Crystallographic studies of an active-site mutant of plant-type L-asparaginase, 24$^{th}$ European Crystallographic Meeting, Marrakech, Morocco, August 22-27.
19. **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, August 8-11.
20. **K. Michalska**, G. Bujacz, M. Jaskolski (2006), Crystal structure of plant asparaginase. XLI$^{th}$ Annual Meeting of the Polish Biochemical Society, Białystok, Poland, 12-15 September.
21. **K. Michalska**, G. Bujacz, M. Jaskolski (2006), Crystal structure of plant asparaginase. 23$^{rd}$ European Crystallographic Meeting, Leuven, Belgium, 6 August -11.
22. M. Jaskolski, **K. Michalska** (2006), L-Asparaginases, their friends and relations. Parnas Lecture, XLI$^{th}$ Annual Meeting of the Polish Biochemical Society, Bialystok, Poland, September 12-15.
23. M. Jaskolski, **K. Michalska** (2006), Hydrolysis at the side chain of asparagine. Chemistry towards Biology, Cracow, Poland, September 8-12.
24. 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.
25. **K. Michalska**, M. Jaskolski (2005), Crystal structure of plant asparaginase/isoaspartyl aminopeptidase. 47$^{th}$ Polish Crystallographic Meeting, Wrocław, Poland, June 30-July 1.

26. **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.
27. **K. Michalska**, G.Bujacz, M.Jaskolski (2004), Crystal structure of plant asparaginase. HEC-7, 7th Heart of Europe Bio-Crystallography Meeting, Krzyzowa, Poland, September 30-October 2.
28. **K. Michalska**, M.Jaskolski (2004), First glimpses of the structure of plant asparaginase. 1st Baltic Sea BioCrystallography Meeting, Luebeck, Germany, September 2-4.
29. **K. Michalska**, K.Brzezinski, M.Jaskolski (2004), Crystal structure of *Escherichia coli* isoaspartyl aminopeptidase in complex with L-aspartate. 46th Polish Crystallographic Meeting, Wrocław, Poland, June 24-25.
30. **K. Michalska**, K.Brzezinski, M.Jaskolski (2003), Crystal structure of *Escherichia coli* isoaspartyl aminopeptidase in complex with L-aspartate. HEC-6, 6th Heart of Europe Bio-Crystallography Meeting, Wittenberg, Germany, September 25-27.
31. 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.

## Structure deposits in the PDB Protein Data Bank

2GEZ 2ZAK 2ZAL 3C17 3GAX 3IE5 3OJ0 3OLO 3ON4 3OP9 3OPC 3QOK
3QOM 3QOO 3QSG 3QSJ 3R1X 3RHT 3RMQ 3RMS 3RRI 3RXY 3RXZ 3SHO
3SSF 3TP9 3TTG 3U2R 4DIM 4EVQ 4EVR 4EVS 4EVU 4EVX 4F66 4F79
4FB7 4GB5 4GBJ 4GPN 4GYT 4GZE 4H3T 4H3V 4H7L 4HFV 4HN9 4I66
4MV2 4MVE 4NNQ 4O2H 4PF1 4Q29 4TX9 4W9T 4WB1 4WD0

## Professional skills

**Molecular biology:** expression construct (plasmid) design and site-directed mutagenesis, protein complexes
**Biochemistry:** protein expression (*E. coli*), high-throughput protein purification (affinity, ion-exchange and size-exclusion chromatography), characterization (electrophoresis, enzyme kinetics, binding assays)
**Biophysics**: UV/VIS, mass spectrometry
**X-ray crystallography:** crystallization, cocrystallization with proteins, DNA and small ligands, heavy-atom derivatization, reductive alkylation, data collection using synchrotron radiation, 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, Chimera, Dino), structure analysis and interpretation