

ALENA KUBÁTOVÁ, Professor

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Research group: <http://arts-sciences.und.edu/chemistry/kubatova-research-group/news.cfm>

Maiden name: Pacáková

1. Educational background

1997 Ph. D. in Analytical Chemistry, Charles University, Prague, Czech Republic.
 1994 M.S. in Analytical Chemistry, Charles University, Prague, Czech Republic.

2. Professional experience

2015– Professor, UND, Grand Forks, Chemistry Department.
 2011– Adjunct Assistant Professor in Department of Chemical Engineering, UND
 2012 – 2015 SUNRISE Initiative Co-Director for UND.
 2010 – 2015 Associate Professor, UND, Grand Forks, Chemistry Department.
 2005 – 2010 Assistant Professor, UND, Grand Forks, Chemistry Department.
 2006 – 2007 Director of the COBRE Mass Spectrometry Core facility, School of Medicine and Health Sciences, University of North Dakota, Grand Forks.
 2003 – 2005 Research Scientist, University of North Dakota, Grand Forks, Energy and Environmental Research Center (EERC);
 Adjunct Assist. Professor University of North Dakota, Grand Forks, Chemistry Department.
 2000 – 2002 Postdoctoral Researcher, University of North Dakota, Grand Forks, EERC
 1999 Independent Researcher, Institute of Microbiology, Czech Academy of Sciences, Czech Republic.
 1998 – 1999 Postdoctoral Researcher, University of Antwerp, Belgium.

Specialty Fields:

Analytical chemistry, Chromatographic methods, Mass spectrometry, Extraction techniques using supercritical CO₂ and hot pressurized water with applications in Atmospheric particulate matter research, Research on isolation of antioxidants from plant matrices, Petroleum industry products, Biomass processing
 Ongoing interest in enhancing experiential learning through scholarship and research experience and outreach

3. Teaching***Courses Taught***

Orientation to Chemistry, Chem 101, 1 credit
 General Chemistry, Chem 121, 3 credits
 Analytical Chemistry, Chem 333 with lab, 4 credits
 Instrumental Analysis III – Chromatography, Chem 443, 2 credits
 Chromatography and Mass Spectrometry, Chem 543, 3 credits
 US MASTER seminar AS299, 1 credit
 Chemistry Capstone course, Chem 492, 3 credits

Research mentoring

Graduate Committees for Ph.D. students 31, for MS students 22
 Including being a chair or co-chair for 19 graduate advisees (15 graduated),
 51 Undergraduate Research Advisees 51 with at least 1 semester of research

Curriculum Development Activities

2018	ALT workshop (Sep 21-22) Advanced learning training in Analytical Chemistry
2017	Workshop for REU programs, "What Matters in mentoring? - Mentoring training," Center for Women Health Research University of Wisconsin Madison. (June 25, 2017 - July 25, 2017).
2016	Redesign of the US MASTER scholarship seminar to allow for broader participation of students from STEM majors from 1 st to 4 th year.
2015	FDIC summer miniproject award for development of Flipped classroom with Lab for Chem 443 AS599 Outreach course, Bringing Science to HS student's
2014	Revision of the seminar for the US MASTER program (the NSF scholarship program)
2013	Development of 1st year Chemistry seminar (with Dr. Kozliak) with goal to ensure cohort interaction of students.
2012	Revision of the Chem 333 lab, ensuring manual for the addition of one lab for SEM (Dr. Zhao lead) Update and improvement of GC and TOF MS training lab/Chem 443/543.
2010	Revision of the lab for Chem 333 to ensure compatibility with ACS requirements, Introduction of the clickers in Chem 333 (~50 students).
2009	Contribution to revision/redesign of the Analytical Chemistry curriculum to fulfill requirements American Chemical Society Accreditation.

4. Services

Served on various **Department committees** including Chair advisory (elected), Safety (chair), Admission graduate Committee, Undergraduate program committees, Chemistry Director for Recruiting/Advisement, Graduate program committees, Graduate admission, instrumentation, safety (chair), Graduate admission, Instrumentation, Seminar gradings committees.

For **AS College**, served on Chemistry-Physics working group, as a A&S TRP committee member, member on A&S Strategic Planning committee, A&S Curriculum committee (3 year, chair 2013-14), Undergraduate Learning Working Group.

Served on various **University committees** including: Senate Budget committee, Essential studies committee member, Promotion and tenure review committee, Senate Scholarly Activities Committee, Advisory Committee for Research Administration, UND Presidential Search committee, Logistics committee for ND State Science fair, Retention Committee, Intellectual Property Committee, UND Senate.

Other UND services included roles such as Investigation for scholarly misconduct, hiring committee for ATM faculty, the evaluation team for Mathematic Department Undergraduate Program review, Hiring committee for the Physics, Director of the COBRE Mass Spectrometry Core facility, School of Medicine and Health Sciences.

Professional associations include Leadership group for research experience for undergraduates (LGREU) NSF funded group to provide feedback and resources to Chemistry REU experience membership in American Society for Mass Spectrometry, Member of Executive Committee for Regional Division ACS, American Geophysical Union, American Association for Aerosol Research, and American Chemical Society.

Served as reviewer

- Reviewed Manuscripts (~8 annually) for J. Chromatogr., ACS Sustainable Chemistry & Engineering, Chemosphere, Anal Bioanal. Chem., J. Analytical & Applied Pyrolysis, ACS Sustainable Chemistry & Engineering Rapid Com. in MS, Ana. Chem.
- National Science Foundation panel reviews (1-2 annually since 2008)
- Reviewer for the proposals (4) for Grant Agency of Czech Republic.
- Opponent for PhD dissertations in Analytical Chemistry (2), Faculty of Natural Sciences, Charles University, Czech Republic, University of Aarhus, Denmark

The **Community and Other Services** included continuous organization and coordination Chemistry outreach for K-12, Organizer of NSF REU PI meeting July 11-13 2018 as LG REU member, HS Air Pollution and Biobased workshops, with TRIO services organized several outreach demos.

5. Publications & Presentations

Peer reviewed papers

*Published over 80 peer reviewed manuscripts (10 most recent and significant are listed below). The manuscripts labeled with asterisk have A. Kubátová as a corresponding author, the underlined are research advisees. For comprehensive list see <http://arts-sciences.und.edu/chemistry/kubatova-research-group/publications.cfm>

1. Kukowski, K., Hatton, J., Kozliak, E., Kubatova, A. The extent of tebuconazole leaching from unpainted and painted softwood. *Sci. Total Environ*, **2018** 633, 1379-1385. <https://doi.org/10.1016/j.scitotenv.2018.03.274>
2. *Andrianova, A., Di Prospero, T., Geib, C., Smoliakova, I., Kozliak, E., Kubatova, A. Electrospray ionization with high-resolution mass spectrometry as a tool for lignomics: Lignin mass spectrum deconvolution. *J. American S. Mass Spectrom*, **2018** 29(5), 1044-1059. <https://doi.org/10.1007/s13361-018-1916-z>
3. *Andrianova, A., Yeudakimenka, N., Lilak, S., Kozliak, E., Ugrinov, A., Sibi, M., Kubatova, A.. Size exclusion chromatography of lignin: The mechanistic aspects and elimination of undesired secondary interactions. *J. Chromatogr. A*, **2017**, 1534, 101-110. <https://doi.org/10.1016/j.chroma.2017.12.051>
4. *Voeller, K., Bilek, H., Kreft, J., Dostalkova, A., Kozliak, E., Kubatova, A. Thermal carbon analysis enabling comprehensive characterization of lignin and its degradation products. *ACS Sustain. Chem. Eng.* **2017**, 5, 1110334-10341 DOI: 10.1021/acssuschemeng.7b02392
5. *Rousova, J.; Chintapalli, M.R.; Lindahl, A.; Casey, A.; Kubátová, A. Simultaneous determination of trace concentrations of aldehydes and carboxylic acids in particulate matter. *J. Chromatogr A*, **2018**, 1544, 49-61. <https://doi.org/10.1016/j.chroma.2018.02.026>
6. Brzonova, I., Asina, F., Andrianova, A. A., Kubatova, A., Smoliakova, I., Kozliak, E., Ji, Y. (2017). Fungal biotransformation of insoluble Kraft lignin into a water soluble polymer. *Industrial & Engineering Chemistry Research*, 56(21), 6103-6113.
7. *Rousova, J.; Kusler, K.; Liyanage, D.; Leadbetter, M.; Dongari, N.; Zhang, K. K.; Novikov, A.; Sauter, E. R.; Kubátová, A., Determination of trans-resveratrol and its metabolites in rat serum using liquid chromatography with high-resolution time of flight mass spectrometry. *J. Chromatogr. B* **2016**, 1039, 35-43. <http://dx.doi.org/10.1016/j.jchromb.2016.10.028>
8. Cochran, R.E.; Kubátová, A.; Kozliak, E.I. An Approach to the Estimation of Adsorption Enthalpies of Polycyclic Aromatic Hydrocarbons on Particle Surfaces. *J. Phys. Chem. A* **2016**, 120 (30), 6029–6038. DOI: 10.1021/acs.jpca.6b03611
9. *Cochran, R.; Smoliakova, I. Kubátová, A. Detection of nitrated and oxygenated polycyclic aromatic hydrocarbons using high resolution mass spectrometry with atmospheric pressure chemical ionization: investigation of in-source ionization mechanisms, *Int. J. Mass Spectrom.* **2016** 397-398, 6-17, <http://dx.doi.org/10.1016/j.atmosenv.2015.12.036>
10. *Cochran R.; Jeong, H.; Haddadi, S.; Fisseha Derseh, R.; Gowan, A.; Beranek, J.; Kubátová, A. Identification of Products Formed During the Heterogeneous Nitration and Ozonation of Polycyclic Aromatic Hydrocarbons *Atmospheric Environ.* **2016**, 128, 92-103 doi:10.1016/j.atmosenv.2015.12.036

Patents

Utility Patent 8,076,504 issued 12/13/2011. Seames, W.; Kubatova, A.; Tande. B. Method To Produce Short Chain Carboxylic Acids And Short Chain Carboxylic Esters From Fatty Acids Bound In Triacyl Glycerides.

6. Professional Presentations

Presented or has been co-authors on over 90 presentations at National and International meetings (+ additional 60 regional and local level). The 10 selected are listed below, and labeled with asterisk have A. Kubátová as a corresponding author, presenting author is underlined.

1. *Kubatova, A.; Andrianova, A.; Lu, S., Reagan, S.; Schumaker, J.; Bilek, H.; Smoliakova, I.; Kozliak, E., 255th ACS National Meeting, "Lignomics: Nanoscience, structure determination and MW-based fractionation using

- SEC, MS, STEM, TD-pyr-GC/MS and thermal carbon analysis," American Chemical Society (ACS), New Orleans, LA. March 20, 2018 (oral).
2. Kubátová, A.; Andrianova (Artemyeva) A.; Kreft, J., Voeller, K., Bílek, H., Schumaker, J; Dostálková, Di Prospero, T.; Geib, C.; Kozliak E. Smoliakova; I.P.; Comprehensive Characterization of Lignin and its Degradation Products: Approaches and Challenges Biotech 2017 & 7th Czech-Swiss Symposium with Exhibition, Prague, Czech Republic, June 13-17, 2017 (Invited speaker)
 3. *Artemyeva, A.; Kubatova, A.; Kozliak, E.I. (June 2016). Optimization of size exclusion chromatography and atmospheric pressure ionization enabling characterization of intact lignin and its degradation products. 64th ASMS Conference on Mass Spectrometry and Allied Topics, San Antonio, TX. June 2016 (oral).
 4. *Kubátová, A.; Artemyeva, A.; Bílek, H., Voeller, K., Kreft, J., Dostálková, Smoliakova; A.; Kozliak E. Lignin as the Source of Renewable Chemicals: Journey to Accurate Characterization of Feedstock and Reaction Products 1st Annual International Symposium on Materials from Renewables Conference. Fargo, ND, July 2016, (Invited speaker)
 5. *Kubatova, A., Cochran, R.E.; Haddadi, S., Derseh R.F. Heterogeneous Atmospheric Reactions: Identification of Polycyclic Aromatic Hydrocarbons Oxidation Products 64th ASMS Conference on Mass Spectrometry and Allied Topics, San Antonio, TX. June 2016 (oral).
 6. *Kubatova, A.; Simmons, R; Pedersen, D. The educational features essential for a successful scholarship program for students at varying stages of degree progress. 251st ACS National Meeting & Exposition, San Diego, CA, March 13-17, 2016, (poster).
 7. *Kubatova, A.; Design of flipped classroom with a lab component for a Chromatography-Mass Spectrometry course, 251st ACS National Meeting & Exposition, San Diego, CA, March 13-17, 2016, (oral).
 8. *Ondrusova, K.; Kubatova, A.; Cochran; R.; Rousova, R.; Totlandsdal, A. I.; Øvrevik, J.; Schwarze, P., Låg, M., Chemical composition vs. toxicity of exhaustively extracted/fractionated diesel exhaust and wood smoke particulate matter; 11th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA) August 10-13, 2015 Lawrence National Laboratory, Berkeley, CA.
 9. *Rousova, J., Kusler, K., Leadbetter, M., Liyanage, D., Dongari, N., Sauter, E., Novikov, A., Kubatova, A. Determination of trans-resveratrol and its metabolites in rat serum and liver using liquid chromatography with high resolution time of flight-mass spectrometry. 249th ACS National Meeting & Exposition, March 22-26, 2015, Denver, CO, USA.
 10. Artemyeva, A.; Kozliak, E.; Kubatova, A. Characterization of lignin degradation products using reversed phase high performance chromatography in combination with evaporative light scattering detection and high resolution mass spectrometry; ASMS Sanibel Conference, January 22-25, 2015, Clearwater Beach, FL, USA.

7. Grants and Contracts Funded

Principal Investigator

Received funding for over 47 proposals as PI, main and or recent funding is listed below

UND World Changing Development in UAS seed program, VPRED, PI Kubatova, A., Bowman, F., Delene, D., Hawthorne, S., Kozliak, E., "Development of Particulate Matter Sampler and Sampling protocol for UAVs " \$10,000.00. (02/19, 2018 – 06/30, 2019).

UND Research Seed Postdoc Programs "Unmanned aerial vehicle sampling of carbonaceous atmospheric particulate matter" PI Kubatova, A., Co-PI Moe, J., Sponsored by, \$84,000, 07 2018 – 06 2020.

Marvin Windows and Doors. "Tebuconazole and fate in windows treatments," I Kubatova, A. Co-PIs: Kozliak, E.; Ondrusova, K. Hatton, J. \$25,809.00. (Jan 1, 2018 - December 31, 2018).

NSF, IRES-IEGAC Interdisciplinary Environmental and Green Applications in Chemistry (IEGAC) PI Kubatova, A. Co-PIs Kozliak, E.; Pierce, D.; Sibi, M. \$249,936, 08/31/2017-08/30/2020

NSF, Division of Undergraduate Education S-STEM "US MASTER II : Undergraduate Scholarships with Mathematics and Science Training, Exploration, and Research," College of Art & Sciences, PI Kubatova, Co-PIs Simmons, Pedersen, Vandenberg, Nelson \$999,952, 02/01/2018–01/31/2023.

Marvin Windows and Doors Extension "Fate of preservatives in window treatments" PI Kubatova, A.; Co-PIs E. Kozliak; K. Ondrusova \$25,809, 04/01/2015 – 08/30/2017

VUV Analytics' academic grant "Vacuum Ultraviolet Research of Atmospheric Particles" PI Kubatova, A; Co-PI Ondrusova, K.; company provides instrument for the research project. 01/01/2016-02/31/2017

NSF REU site, Interdisciplinary Renewable and Environmental Chemistry (IREC) Research Experience for Undergraduates (REU) site \$270,000 PI Kubatova, Co-PI Bowman 06/01/2015 – 05/30/2018

Marvin Windows and Doors “Fate of preservatives in window treatments” PI Kubatova, A.; Co-PI E. Kozliak \$34,269, 05/01/2013 – 12/30/2015.

BioAmber “Analytical methods for the identification of known and unknown impurities in dicarboxylic acid sample” PI Kubatova \$59,117. 6/1/2012–12/30/2013.

ACS Innovative Project Awards “Combined Education and Research for American Indian Scientists (CERAIS)”, PI Kubatova, A.; Co-PI Cochran, R. \$2,213 06/01/2012-12/20/2012.

NSF, Division of Undergraduate Education “Undergraduate Studies with Environmentally Oriented Research” College of Art & Sciences, PI Kubatova, Co-PIs Simmons, Goodwin, Zerr, Vandenberg \$598,110, 02/01/2011–01/31/2017.

NSF ATM Carbonaceous tracers in thermal desorption and pyrolytic organic particulate matter Kubatova (PI), Kozliak, Bowman, Simmons, Robinson (Co-PIs) 583,926 Submitted Se. 15 2018

NSF, Atmospheric Sciences Division “CAREER: Formation pathway of polar derivatives of nitro-PAHs” \$640,000, 05/01/2008 – 04/30/2015. (ATM-0747349)

Marvin Windows and Doors “Method Development for Determination of Wood Preserving Fungicides” \$57,990, 06/01/2008 – 12/31/2010.

Department of Health and Human Services, National Institute of Health “COBRE mass spectrometric core” PI Geiger J. (School of Med. and Health Sci.), Co-PI Kubátová A. \$186,837 07/01/2006 – 06/30/2007.

U.S. Department of Energy (DOE), EERC. “Organic carbonaceous particulate and metal speciation.” Kubátová A. \$100,000 April 2004 – August 2005.

U.S. DOE, EERC. “Fractionation of organics from air particulates with subcritical water.” Kubátová A. \$100,000 April 2003 – August 2004.

Co-PI or Collaborative Group Proposals

NSF EPSCoR, “Collaborative Research: Dakota Bioprocessing Consortium (DakotaBioCon)” Hoffmann, M. PI, Johnson, P. Research Team Leader: Co-PI, Kubatova, A., Kozliak, E. Seames, W., Smoliakova, I., Tande, B., Ji, Y” \$6,000,000 UND, NDSU, SDSU, SDSMT; \$1,500,000 UND, August 2013 – July 2016.

State of North Dakota’s Centers of Excellence Commission “SUNRISE BioProducts Center of Excellence” PI Seames W. (Chem. Eng.), contributor Kubátová A \$2,950,000, by the State of North Dakota’s Centers of Excellence Commission, 2008–2013.

NSF Chemistry Research Instrumentation and Facilities CRIF MU “Acquisition of a High Resolution Scanning Electron Microscope for Research and Education in Nanochemistry” PI Hoffmann, M., Co-PIs Zhao, J.; Pierce, D.; Kubatova, A. \$ 442,976, 01/01/2010 – 01/30/2012.

ND Soybean Council (NDSC) “Fuels, Chemicals, and Polymers from Soybean Oil” PI Seames, W., Co-PIs: Kubatova, A., Tande, B., Benson, S. \$80,000, 7/1/2010/6/30/2011.

UND Faculty Research Seed Money “Determination of trans-resveratrol and its metabolites in human serum and in a human relevant animal model of breast cancer” PI Sauter E.; Co-PIs Kubatova, A.; Novikov, A. \$20,000, 1/1/2011 – 12/31/2013.

Menon & Associates “Assessment of Menon Microbial-Based TG Oil Using the UND Crop Oil Conversion Technology Process” PI Seames, W. ; Co-PI Kubatova, A., \$10,000 1/1/2011–3/31/2011.

Federal Aviation Administration (FAAA) - Center for General Aviation Research (CGAR) “Octane enhancers from crop oil” PI Seames W. (Chem. Eng.), contributor Kubátová A. \$380,952, 05/15/07 – 12/31/08.

NSF “Undergraduate interdisciplinary research emphasizing the application of environmental chemistry to address societal issues” PIs Kozliak E., Mann M. (Chem. Eng.), contributor Kubátová A. \$168,000, 03/01/2006 – 12/31/2008.

U.S. DOE, EPSCoR IIP “Advances in the fundamental understanding of coal combustion emission mechanisms” PIs Hoffmann M., Hershberger J. (NDSU Chem), Seames W. (Chem. Eng.), task leader Kubátová A. (\$30,000 per year) \$1,500,000, 09/21/06 – 05/06/09.

Department of Health and Human Services, National Institute of Health (NIH) “Pathophysiological signaling in neurodegenerative disorders” PI Geiger J., contributor Kubátová A. \$ 10,092,241, 07/01/2007 – 06/30/2012.
(Funded but resigned from the position)

8. Honors/Awards

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| 2018 | Chester Fritz Distinguished Professor, UND |
| 2015 | The UND Foundation/B.C. Gamble Faculty Award for Excellence in Teaching, Research or Creative Activity, and Service |
| 2014 | UND Foundation Thomas J. Clifford Faculty Achievement Award for Excellence in Research. |
| 2013 | North Dakota Spirit Faculty Achievement Awards 2013 to recognize significant contributions by faculty in teaching, research and service, College of Arts & Sciences. |
| 2010 | North Dakota Spirit Faculty Achievement Award in recognition of significant contributions in teaching, research, and service, College of Arts & Sciences. |
| 2007 | Nominated by Presidential Scholar(s) as a one of UND’s “faculty stars) (e.g., faculty who influenced students by her/his teaching. |
| 2001 | Award for outstanding presentation, AOCs 2001 Minneapolis, Minnesota. |
| 1999 | Best poster award at the Session Atmospheric Aerosols of the 6 th Scientific Conference of the International Global Atmospheric Chemistry Project, Bologna, Italy. |
| 1996 | Award from Czech Ministry of Education and Sport, “Talent 1996,” for work carried out during participation on the project “Biodegradation of PCBs by white rot fungi.” |