

**Nataliya A. Markina**

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***CURRICULUM VITAE*****PROFESSIONAL APPOINTMENT**

Lecturer of Chemistry August 2021 – present  
University of Houston - Clear Lake, Houston, TX

**EDUCATION**

**Iowa State University** August 2007 - August 2012  
**Ph. D., Organic Chemistry,**  
Ames, Iowa, GPA 4.0/4.0; Advisor: Professor Richard C. Larock  
Thesis title: “Metal-catalyzed and aryne-mediated multicomponent approaches to heterocycles”

**Higher Chemical College of the Russian Academy of Sciences** July 2002 - February 2008  
**B. S. / M. S. (Specialist), Chemistry,**  
Moscow, Russia

**TEACHING EXPERIENCE**

**University of Houston – Clear Lake, Houston, TX** August 2019 - present  
Visiting Assistant Professor of Chemistry  
and Lecturer of Chemistry

- CHEM 2123 (Laboratory for Organic Chemistry I) (F2F, Online and Bimodal formats)
- CHEM 2125 (Laboratory for Organic Chemistry II) (F2F, Online and Bimodal formats)
- CHEM 2323 (Organic Chemistry I, F2F and Online format)
- CHEM 2325 (Organic Chemistry II, Bimodal format)
- CHEM 4389 (Independent Study in Chemistry)
- BIOL 4115 (Biology Practicum-Chemistry Laboratories)
- CHEM 4115 (Chemistry Practicum-Chemistry Laboratories)

**Lee College, Baytown, TX** June 2019 – July 2019  
Adjunct Instructor of Chemistry

- CHEM 1411 (General Chemistry I, Lecture and Laboratory)

**University of Houston – Clear Lake, Houston, TX** August 2018 – May 2019  
Adjunct Instructor of Chemistry

- CHEM 1111 (Laboratory for General Chemistry I)

- CHEM 2123 (Laboratory for Organic Chemistry I)

**Wyzant Inc., private tutor**

January 2013 - present

**Iowa State University, Ames, IA**

August 2007 - July 2012

Graduate Teaching Assistant

- CHEM 177 (General Chemistry), Recitation teaching assistant
- CHEM 177L (General Chemistry), Laboratory teaching assistant
- CHEM 178 (General Chemistry), Recitation teaching assistant
- CHEM 178L (General Chemistry Laboratory), Laboratory teaching assistant
- CHEM 231L (Elementary Organic Chemistry Laboratory), Laboratory teaching assistant
- CHEM 331L (Organic Chemistry Laboratory), Laboratory teaching assistant
- CHEM 332L (Organic Chemistry Laboratory II), Laboratory teaching assistant

**RESEARCH EXPERIENCE****University of Houston – Clear Lake, Houston, TX**

January 2020 - present

Visiting Assistant Professor of Chemistry  
and Lecturer of Chemistry**Iowa State University, Ames, IA**

August - December 2012

Predoctoral Research Associate  
with Prof. Richard C. Larock**Iowa State University, Ames, IA**

May 2008 - July 2012

Graduate Research Assistant  
with Prof. Richard C. Larock**University of Missouri - Kansas City, Kansas City, MO**

June - August 2006

Undergraduate Research Intern  
with Prof. Keith R. Buszek**Iowa State University, Ames, IA**

July - September 2005

Undergraduate Research Intern  
with Prof. George A. Kraus**N.D. Zelinsky Institute of Organic Chemistry,  
Moscow, Russia**

November 2001 - June 2007

Undergraduate Research Associate

## RESEARCH INTERESTS

Organic chemistry, palladium and transition-metal catalyzed reactions, chemistry of arynes, total synthesis of natural products, combinatorial chemistry, multicomponent reaction strategies, green chemistry, medicinal chemistry, drug design and discovery.

## PROFESSIONAL EXPERIENCE

Equipment and software maintenance for the JEOL 500 NMR spectrometer.

University of Houston – Clear Lake August 2019 - present

Received multiple trainings from JEOL professionals on NMR preventive maintenance, cryogen refilling, troubleshooting between August 2019 and March 2020. Received training on GC-MS preventive maintenance, tuning and ion trap cleaning procedures in August 2020.

## PROFESSIONAL DEVELOPMENT AND SERVICE ACTIVITIES

- Peer Teaching Evaluation Task Force at UHCL November 2020-present
- CITI Program Courses: Social-Behavioral-Educational Research. Basic training completed. Oct 2020
- Tier II strategic Planning Workshops, CSE at UHCL March 2020-present
- JEOL NMR Training on Maintenance, Operation, and Data Processing, at UHCL Oct 2019

## HONORS, AWARDS

- The Chevron Phillips Fellowship, Iowa State University, 2011
- The Frank J. Moore and Thoreen Beth Moore Fellowship, Iowa State University, 2010

## MEMBERSHIPS

- Golden Key International Honor Society: member since 2008

## GRANT APPLICATIONS

Collaborative Research: ECR DBER: Investigating Dormant Essential Automaticity Skills (IDEAS) in STEM (NSF proposal #2054904, role: CO-PI, pending, submitted September 2020)

Combined Effects of Moisture and UV Light on Polymeric Materials (NSF proposal # 2104624, role: senior personnel – NMR analyst, pending, submitted November 2020)

**BOOKS**

Co-author of the third edition of Larock's Comprehensive Organic Transformations reference (3960 pages, ISBN 978-0-470-92795-3, published March 20, 2018) August 2012 - October 2017

Co-author of the of Applications of Palladium in Organic Synthesis: A Mechanistic Approach (Editor: Richard Larock) January 2020 - present

**PUBLICATIONS**

Markina, N. A.; Chen, Y.; Larock, R. C. "An Efficient, Microwave-assisted, One-pot Synthesis of 2,3-Disubstituted Benzofurans under Sonogashira Conditions," *Tetrahedron*, **2013**, *69*, 2701-2713;

Dubrovskiy, A. V.; Markina, N. A.; Larock, R. C. "Use of Benzynes in the Synthesis of Heterocycles," *Org. Biomol. Chem.*, **2013**, *11*, 191-218;

Lu, C.; Markina, N. A.; Larock, R. C. "Synthesis of *N*-Acylcarbazoles through Palladium-catalyzed Aryne Annulation of *ortho*-Haloacetanilides," *J. Org. Chem.*, **2012**, *77*, 11153-11160;

Rogness, D. C.; Markina, N. A.; Waldo, J. P.; Larock, R. C. "Synthesis of Pyrido[1,2-*a*]indole Malonates and Amines through Aryne Annulation," *J. Org. Chem.*, **2012**, *77*, 2743-2755;

Markina, N. A.; Dubrovskiy, A. V.; Larock, R. C. "One-pot Synthesis of 1-Alkyl-1*H*-indazoles from 1,1-Dialkylhydrazones *via* Aryne Annulation," *Org. Biomol. Chem.*, **2012**, *10*, 2409-2412;

Dubrovskiy, A. V.; Markina, N. A.; Larock, R. C. "Iodocyclization, Followed by Palladium-Catalyzed Coupling: A Versatile Strategy for Heterocyclic Library Construction: Mini-Review," *Comb. Chem. High Throughput Screen.*, **2012**, *15*, 451-472;

Markina, N. A.; Mancuso, R.; Neuenswander, B.; Lushington, G. H.; Larock, R. C. "Solution-Phase Parallel Synthesis of a Diverse Library of 1,2-Dihydroisoquinolines," *ACS Comb. Sci.* **2011**, *13*, 265-271;

Chen, Y.; Markina, N. A.; Yao, T.; Larock, R. C. "Synthesis of 2,3-Disubstituted Indoles *via* Palladium-catalyzed Annulation of Internal Alkynes: 3-Methyl-2-(trimethylsilyl)indole," *Org. Synth.* **2011**, *88*, 377-387;

Chen, Y.; Markina, N. A.; Larock, R. C. "An Efficient, Microwave-assisted, One-pot Synthesis of Indoles under Sonogashira Conditions," *Tetrahedron*, **2009**, *65*, 8908-8915;

Brown, N.; Xie, B.; Markina, N. A.; VanderVelde, D.; Perchellet J.-P. H.; Perchellet E. M.; Crow, K. R.; Buszek, K. R. "Synthesis of a Natural Product-inspired Eight-membered Ring Lactam Library *via* Ring-closing Metathesis," *Bioorg. Med. Chem. Lett.* **2008**, *18*, 4876-4879;

Markina, N. A.; Voznyi, Ya. V. "A Short Synthesis of 4-Deoxy-4-fluoroglucosaminides: Methylumbelliferyl *N*-Acetyl-4-deoxy-4-fluoro- $\alpha$ -D-glucosaminide," *Russian J. Bioorg. Chem.* **2008**, *34*, 475-479.

## PRESENTATIONS AND POSTERS

Markina, N. A.; Dubrovskiy, A. V. and Larock, R. C.; "One-pot Synthesis of 1-Alkyl-1-*H*-indazoles from *N,N*-Dialkylhydrazones, NCS, and Arynes," International Congress on Organic Chemistry, Kazan, Russia, September 18-23, 2011; (poster)

Markina, N. A.; Chen, Y. and Larock, R. C.; "Microwave-assisted, One-pot, Three-component Synthesis of Indoles and Benzofurans under Sonogashira Conditions and Applications to the Synthesis of Natural Products and Combinatorial Libraries," National Meeting of the Centers of Excellence in Chemical Methodologies and Library Development, Boston, MA, August 25, 2010; (poster)

Markina, N. A.; Chen, Y. and Larock, R. C.; "Highly Efficient, Microwave-assisted, One-pot Synthesis of 2,3-Disubstituted Benzofurans under Sonogashira Conditions," 240<sup>th</sup> National Meeting of the American Chemical Society, Boston, MA, August 23, 2010; (talk)

Chen, Y.; Markina, N. A. and Larock, R. C.; "An Efficient, Microwave-assisted, One-pot Synthesis of Indoles under Sonogashira Conditions," Annual Meeting of the National Institutes of Health Kansas University Center of Excellence in Chemical Methodologies and Library Development, Lawrence, KS, October 21, 2009; (poster)

Markina, N. A., Mancuso, R., Lushington, J., Neuenswander, B. and Larock, R. C.; "Synthesis of a Diverse Library of 1,2-Dihydroisoquinolines Based on a Lewis Acid and Organocatalyst-cocatalyzed Multicomponent Reaction of 2-(1-alkynyl)benzaldehydes, Amines and Ketones," Annual Meeting of the National Institutes of Health Kansas University Center of Excellence in Chemical Methodologies and Library Development, Lawrence, KS, October 21, 2009; (poster)

Markina, N. A., Makarenkova, L. M., Ioffe, S.L. 13<sup>th</sup> Mendeleev's student school-conference, Moscow, Russia, "Silylated derivatives of aliphatic nitrocompounds in the synthesis of modified natural aminoacids" November 7-10, 2002. (poster)

### Contributed to presentations:

Mancuso, R., Markina, N. A. and Larock, R. C.; "Library Synthesis of 1,2-Dihydroisoquinolines by Lewis Acid- and Organocatalyst-Cocatalyzed Multicomponent Reaction of 2-Alkynylbenzaldehydes, Amines and Ketones," VIII Giornate di Chimica delle sostanze Naturali (NAT8), Forte dei Marmi, March 22-25, 2009; (poster)

Brown, N.; Xie, B.; Coleman, T. L.; Mansfield, J. K.; Markina, N.; Minatoya, M.; Gao, G.; Kearney, A.; Jeong, Y.; Sato, N.; Buszek, K. R.; "Design and Synthesis of Medium-ring Lactam

*Libraries Inspired by Octalactin A,*” 234th ACS National Meeting, Boston, MA, United States, August 19-23, 2007; (poster)

Xie, B.; Brown, N.; Mansfield, J. K.; Markina, N.; Sato, N.; Jeong, Y.; Coleman, T. L.; Kearney, A.; Buszek, K. R.; “*Novel Eight-membered Ring Compound Libraries Inspired by Natural Products,*” 41st Midwest Regional Meeting of the American Chemical Society, Quincy, IL, United States, October 25-27, 2006; (poster)

## LANGUAGES

- Russian (native proficiency)
- English (fluent proficiency)
- French (elementary proficiency)