James **Wade**

ASSOCIATE RESEARCH SCIENTIST

Analytical Science / Core Research & Development / Dow

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About me

- Researcher combining chemistry & data science in large industrial research organization, part of Core R&D
- Founder & leader of data science and digitalization strategy team for ~400 person group (Analytical Science)
- Project manager for RStudio Academy and RStudio enterprise products for R&D
- Creator and maintainer of multiple internal R packages
- Project leader of multinational teams demanding strong organization and stakeholder management
- Advocate, author, and educator for Citizen Data Science in R&D, a program empowering researchers to gain more insights from their data and share with others

Experience

Dow   *Midland, MI*

ASSOCIATE RESEARCH SCIENTISTS   *2020-*

- Developed and led training in Citizen Data Science (CDS) and RStudio Academy with major contributions to CDS training materials and Academy content. Formed and led the data science strategy team tasked with defining best practices for Dow to adopt changes coming out of CDS and Digital Materials Science projects, major projects for AI enablement. Led a project for AI-enabled polyethylene recycling to maintain high performance even with high levels of recycled plastic content. Key player in Dow's AI Strategy Workshop to define the organizational operating model to enable AI projects, and continued leader the Scale & Standards of the enterprise-wide AI strategy project. Developed applications to simplify polymer separations lab work and data analysis, and built internal packages to scale and deploy successful models.

Dow   *Midland, MI*

SENIOR CHEMIST   *2018-2020*

- Upon joining a rotational program in Dow, developed a method for polyethylene characterization resulting in 10X faster analysis time with equivalent decision-making information. Key team member applying non-standard methods for catalyst characterization to support production trial run of a critical polyethylene product. As part of a rotational program, joined a Chemometrics and AI team pioneering a deep learning and a Bayesian approach to modeling Dow product performance. In a rotation with a supply chain innovation center, imparted additional chemistry knowledge to contribute tackling an industry-wide challenge in trade product classification. Built a Duty Drawback tool as a shiny app to enable a $2.5MM one-time and $1.2MM annual duty refund. Led the Scale & Standards team within Dow's AI Competency Center and was a Planning Team member helping set direction for Dow's enterprise-wide AI Strategy. Sat on Core R&D's Citizen Data Science leadership team.

University of Michigan   *Ann Arbor, MI*

POSTDOCTORAL FELLOW   *2017*

- Ensured a smooth transition between universities when Prof. Ryan Bailey moved his lab from UIUC to the University of Michigan during the final year of graduate career. Transitioned to a post-doc role for the last year in the lab and continued research activities from UIUC.

University of Illinois at Urbana-Champaign   *Urbana, IL*

GRADUATE RESEARCH FELLOW   *2012-2017*

- Developed biosensors and microfluidic tools for applications in precision medicine and functional diagnostics under professor Ryan Bailey. Designed and built multiplex diagnostic panels using a silicon photonic microring resonator array platform for applications in precision medicine. Devised and led additional projects including the design, fabrication, and implementation of a microfluidic platform for Nanodisc assembly and purification for membrane protein studies and the integration of microring resonators with separations technologies with applications in industrial polymer analysis. Directly oversaw the work of four undergraduate and three graduate students and informally supported research efforts of many more. Contributed to multiple successful proposals at multiple national research funding agencies (NSF, NIH).

Furman University   *Greenville, SC*

UNDERGRADUATE RESEARCH FELLOW   *2008-2012*

- In the Wheeler lab at Furman, characterized the structure and reactivity of Cr(III)- and Ru(II)-based transition metal complexes and assessed their photo-reactivity with DNA for applications in photodynamic therapy. Provided chromatographic and and mass spectrometric structural characterization for various other labs in the department. Research work resulted in 2 publications and 14 presentations at regional, national, and international conferences. Mentored and trained five undergraduate students, three of whom pursued graduate degrees in analytical chemistry.

Education

University of Illinois at Urbana-Champaign   *Urbana, IL*

DOCTOR OF PHILOSOPHY IN CHEMISTRY   *2012-2017*

- Thesis: Expanding the Toolbox for Precision Medicine with Silicon Photonic Microring Resonators and Microfluidic Technologies

Furman University   *Greenville, SC*

BACHELOR OF SCIENCE IN CHEMISTRY   *2008-2012*

- Thesis: Characterization of Cr(III) and Ru(II) Complexes with ESI-MS and the Investigation of Potential Bond Formation between Cr(III) and DNA using UPLC-ESI-MS

Awards & Recognition

Technical Achievement Award in Consumer Solutions - Project Lead   *Dow*

INTERNAL AWARD FOR RESEARCH BREAKTHROUGHS WITH STRONG LIKELIHOOD OF HIGH VALUE CREAITON   *2021*

2021 WRAP/Tech Center Award - Project Lead   *Dow*

INTERNAL AWARD FOR SIGNIFICANT VALUE DELIVERY ALIGNED TO MANUFACTURING OR SUPPLY CHAIN   *2021*

Winner (1 of 3) of Dow Data Science Challenge - Project Lead   *Dow*

INTERNAL COMPETITION TO FUND PROJECTS WITH TRANSFORMATIVE POTENTIAL IN DATA SCIENCE   *2019*

ACS Division of Analytical Chemistry Graduate Fellowship   *University of Illinois*

AMERICAL CHEMICAL SOCIETY RECOGNITION OF TOP GRADUENT STUDENTS IN ANALYTICAL CHEMISTRY   *2016*

NSF Graduate Research Fellow   *University of Illinois*

A GRANT AWARDED BY NATIONAL SCIENCE FOUNDATION TO ENTIRELY FUND THREE YEARS OF GRADUATE RESEARCH   *2012-15*

Publications (Selected)

In addition to the listed publications, I have authored or co-authored 20 internal publications, 25 internal technical reports, and 4 internal filings for intellectual property disclosure.

1. Mordan, E. H., Wade, J. H., Pearce, E., Meunier, D. M., & Bailey, R. C. (2020). A linear mass concentration detector for solvent gradient polymer separations. *Analyst*, *145*(13), 4484–4493.

2. Meunier, D. M., Wade, J. H., Janco, M., Cong, R., Gao, W., Li, Y., Mekap, D., & Wang, G. (2020). Recent advances in separation-based techniques for synthetic polymer characterization. *Analytical Chemistry*, *93*(1), 273–294.

3. Mordan, E. H., Wade, J. H., Wiersma, Z. S., Pearce, E., Pangburn, T. O., deGroot, A. W., Meunier, D. M., & Bailey, R. C. (2018). Silicon photonic microring resonator arrays for mass concentration detection of polymers in isocratic separations. *Analytical Chemistry*, *91*(1), 1011–1018.

4. Wade, J. H., Jones, J. D., Lenov, I. L., Riordan, C. M., Sligar, S. G., & Bailey, R. C. (2017). Microfluidic platform for efficient nanodisc assembly, membrane protein incorporation, and purification. *Lab on a Chip*, *17*(17), 2951–2959.

5. Wade, J. H., & Bailey, R. C. (2016). Applications of optical microcavity resonators in analytical chemistry. *Annual Review of Analytical Chemistry (Palo Alto, Calif.)*, *9*(1), 1.

6. Wade, J. H., Alsop, A. T., Vertin, N. R., Yang, H., Johnson, M. D., & Bailey, R. C. (2015). Rapid, multiplexed phosphoprotein profiling using silicon photonic sensor arrays. *ACS Central Science*, *1*(7), 374–382.

7. Wade, J. H., & Bailey, R. C. (2014). Refractive index-based detection of gradient elution liquid chromatography using chip-integrated microring resonator arrays. *Analytical Chemistry*, *86*(1), 913–919.

8. Hudson, J. S., Eberle, J. F., Vachhani, R. H., Rogers, L. C., Wade, J. H., Krishnamurthy, R., & Springsteen, G. (2012). A unified mechanism for abiotic adenine and purine synthesis in formamide. *Angewandte Chemie*, *124*(21), 5224–5227.

9. Sun, C., Turlington, C. R., Thomas, W. W., Wade, J. H., Stout, W. M., Grisenti, D. L., Forrest, W. P., VanDerveer, D. G., & Wagenknecht, P. S. (2011). Synthesis of cis and trans bis-alkynyl complexes of cr (III) and rh (III) supported by a tetradentate macrocyclic amine: A spectroscopic investigation of the m (III)–alkynyl interaction. *Inorganic Chemistry*.

Presentations (Selected)

These presentations are selected from >20 external presentations, mostly given at scientific meetings.

1. Wade, J. (2022). Empowering citizen data scientists with RStudio acadmey. *RStudio Meetup*.

2. Wade, J., & Malloure, M. (2021). Accelerating innovation with artificial intelligence in r&d. *Dow's BEST Symposium*.

3. Wade, J., & Chiang, L. (2021). Industrial perspective of AI, ML, and data science. *Guest Lecture, University of California at Berkeley*.

4. Wade, J. H., Sarkaria, J. N., & Bailey, R. C. (2017). Functional diagnostics for precision medicine with silicon photonic microring resonator arrays. *MicroTAS*, 1289–1290.