JULIAN AVERY REES, Ph.D.

Chemical Sciences Division | Heavy Element Chemistry Program
Lawrence Berkeley National Laboratory
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EDUCATION

2013, 2016 **M.S., Ph.D. Chemistry,** University of Washington, *Seattle, WA*
"*Insight into biological small-molecule activation from enzymes, model complexes and X-ray spectroscopy"*

2009 **B.A. Chemistry,** with ACS certification, Goucher College, *Baltimore, MD*
"Mechanism and inhibition of amyloid-β fibril formation by metal quinoline derivatives"

PROFESSIONAL EXPERIENCE AND EMPLOYMENT

2017 – Present **Lawrence Berkeley National Laboratory,** *Berkeley, CA*
Chemist Postdoc Fellow, Heavy Element Chemistry Program, Chemical Sciences Division
Advisor: Professor Rebecca J. Abergel

2014 – 2015 **Max Planck Institute for Chemical Energy Conversion,** *Mülheim an der Ruhr, Germany*
DAAD Graduate Scholar, Department of Molecular Theory and Spectroscopy
Advisor: Professor Dr. Serena DeBeer

2011 – 2016 **University of Washington,** *Seattle, WA*
Graduate Student, Predoctoral Instructor, Department of Chemistry
Advisor: Professor Julie A. Kovacs

2009 – 2011 **Notre Dame of Maryland University**, *Baltimore, MD*
Technical Support Specialist, School of Pharmacy

2008 **Amgen, Inc.,** *Seattle, WA*
Undergraduate Intern, Protein Biochemistry Group
Advisor: Dr. David P. Meininger

2007 – 2009 **Goucher College,** *Baltimore, MD*
Undergraduate Research Student, Department of Chemistry
Advisor: Professor Scott P. Sibley

HONORS, AWARDS AND RESEARCH SUPPORT

2015 – 2016 Basil G. and Gretchen F. Anex Endowed Fellowship in Chemistry (University of Washington)
2015 Graduate Student Travel Award (University of Washington) - $750 travel expenses
2014 – 2015 X-ray Beamtime - 3 awarded / 3 applications (European Synchrotron Radiation Facility) - total 16 days
2014 – 2015 Graduate Study Scholarship, (German Academic Exchange Service, DAAD) - €10,000 / 10 months
2009 ACS Undergraduate Award for Excellence in Inorganic Chemistry (Goucher College)
2009 Louise Kelley Prize in Chemistry (Goucher College)
2009 Student Employee of the Year Award (Goucher College)

PUBLICATIONS

13. Rees, J.A.; Deblonde, G.J.-P.; An, D.D.; Ansoborlo, C.; Gauny, S.S.; Abergel, R.J. "Evaluating the potential of chelation therapy to prevent and treat gadolinium deposition from MRI contrast agents." *Sci. Rep.* **2018**, *8*, 4419

12. Leipzig, B.K; Rees, J.A.; Kowalska, J.K.; Theisen, R.M.; Kavcic, M.; Poon, P.C.Y.; Kaminsky, W.; DeBeer, S.; Bill, E.; Kovacs, J.A. "How Do Ring Size and π-Donating Thiolate Ligands Affect Redox-Active, α-Imino-N-Heterocycle Ligand Activation?" *Inorg. Chem.* **2018**, *57,* 1935-1949

11. Agbo, P; Rees, J.A.; Abergel, R.J. "Actinide Biological Inorganic Chemistry: The Overlap of 5f Orbitals with Biology" in *Experimental and Theoretical Approaches to Actinide Chemistry: From Fundamental Systems to Practical Applications* edited by J.K. Gibson and W.A. de Jong. John Wiley & Sons, **2018**

10. Kowalska, J.K.; Nayyar, B.; Rees, J.A.; Scheiwer, C.E.; Lee, S.C.; Kovacs, J.A.; Meyer, F., Weyhermüller, T.; Otero, E.; DeBeer, S. "Iron $L_{2,3}$-edge X-ray Absorption and Magnetic Circular Dichroism Studies of Molecular Iron Complexes with Relevance to the FeMoco and FeVco Active Sites of Nitrogenase" *Inorg. Chem.* **2017**, *56*, 8147-8158

9. Römelt, C.; Song, J.; Tarrago, M.; Rees, J.A.; van Gastel, M.; Weyhermüller, T.; DeBeer, S.; Bill, E.; Neese, F.; Ye, S. "Electronic Structure of a Formal Fe(0) Porphyrin Complex Relevant to CO_2 Reduction." *Inorg. Chem.* **2017**, *56*, 4745-4750

8. Casitas, A.; Rees, J.A.; Goddard, R.; Bill, E.; DeBeer, S.; Fürstner, A. "Two Exceptional Homoleptic Fe(IV) Tetraalkyl Complexes." *Angew. Chem. Int. Ed.* **2017**, *129*, 10242-10247 *****Highlighted in Nature Reviews Chemistry***

7. Rees, J.A.; Bjornsson, R.; Kowalska, J.K.; Lima, F.A.; Schlesier, J.; Sippel, D.; Weyhermüller, T.; Einsle, O.; Kovacs, J.A.; DeBeer, S. "Comparative Electronic Structures of Nitrogenase FeMoco and FeVco." *Dalton Trans.* **2017,** *46*, 2445-2455 *****Highlighted on back cover***

6. Villar-Acevedo, G.; Lugo-Mas, P.; Blakely, M.N.; Rees, J.A.; Ganas, A.S.; Hanada, E.M.; Kaminsky, W.; Kovacs, J.A. "Metal-Assisted Oxo Atom Addition to an Iron(III)-Thiolate." *J. Am. Chem. Soc.* **2017**, *139*, 119-129

5. Kowalska, J.K.; Lima, F.A.; Pollock, C.J.; Rees, J.A.; DeBeer, S. "A Practical Guide to High-Resolution X-ray Spectroscopic Measurements and Their Applications in Bioinorganic Chemistry." *Isr. J. Chem.* **2016**, *56*, 803-815

4. Rees, J.A.; Wandzilak, A.; Maganas, D.; Wurster, N.; Hugenbruch, S.; Kowalska, J.K.; Pollock, C.J.; Lima, F.A.; Finkelstein, K.D.; DeBeer, S. "Experimental and Theoretical Correlations Between Vanadium K-edge X-ray Absorption and Kβ Emission Spectra." *J. Biol. Inorg. Chem.* **2016**, *21*, 793-805

3. Kupper, C.; Rees, J.A.; Dechert, S.; DeBeer, S.; Meyer, F. "Complete Series of $\{FeNO\}^8$, $\{FeNO\}^7$ and $\{FeNO\}^6$ Complexes Stabilized by a Tetracarbene Macrocycle." *J. Am. Chem. Soc.* **2016**, *138*, 7888-7898

2. Rees, J. A.; Bjornsson, R.; Schlesier, J.; Sippel, D.; Einsle, O.; DeBeer, S. "The Fe-V Cofactor of Vanadium Nitrogenase Contains an Interstitial Carbon Atom." *Angew. Chem. Int. Ed.* **2015**, *54*, 13249-13252

1. Rees, J. A.; Martin-Diaconescu, V.; Kovacs, J. A.; DeBeer, S. "X-ray Absorption and Emission Study of Dioxygen Activation by a Small-Molecule Manganese Complex." *Inorg. Chem.* **2015**, *54*, 6410-6422

PATENTS

1. Rebecca Abergel, Ilya Captain, Julian Rees "Peptoid-based chelating molecules" WO/2018/063638

POSTERS AND PRESENTATIONS

11. "Metals in biology – from chemical transformations to cancer therapies." *****Invited seminar****, Department of Biology and Chemistry, Embry Riddle Aeronautical University, Prescott, AZ, November 2018*

10. "Bio-inspired peptoid chelators for imaging and targeted alpha therapy." *Poster, TERACHEM Symposium on Technetium and Other Radiometals in Chemistry and Medicine, Bressanone, Italy, September 2018*

9. "High-resolution X-ray spectroscopy of nitrogenase FeMoco and FeVco" *****Invited seminar***, *CHESS Users' Meeting and X-ray Emission Spectroscopy Methods Workshop, Cornell High Energy Synchrotron Source, Cornell University, Ithaca, NY, May 2018*

8. "Bio-inspired peptoid chelators for imaging and targeted alpha therapy." *Poster, Symposium on Radiopharmaceutical Chemistry, National Meeting of the American Chemical Society, New Orleans, LA, March 2018*

7. "Prevention and treatment of internal gadolinium contamination from MRI contrast agents." *Poster, Metals in Biology Gordon Research Conference and* *****Selected oral presentation,*** *Bioinorganic Chemistry Gordon Research Seminar, Ventura, CA, January 2018*

6. "Comparative electronic structure of the molybdenum and vanadium nitrogenases." *****Selected oral presentation****, poster, Penn State Bioinorganic Chemistry Workshop, State College, PA, June 2016*

5. "The inorganic chemistry of biological nitrogen fixation." ****Invited seminar**, Annual Chemistry Department Banquet, Goucher College, Baltimore, MD, April 2016*

4. "Comparative electronic structure of the molybdenum and vanadium nitrogenases." *Poster, Metals in Biology Gordon Research Conference and Bioinorganic Chemistry Gordon Research Seminar, Ventura, CA, January 2016*

3. "Geometric and electronic structure of the Fe-V cofactor in vanadium nitrogenase determined by X-ray spectroscopy." *Poster, CHESS Users' Meeting, Cornell High Energy Synchrotron Source, Cornell University, Ithaca, NY, June 2015*

2. "X-ray spectroscopic investigation of small-molecule manganese O_2 activation." ****Selected oral presentation**, poster, Bioinorganic Chemistry Gordon Research Seminar, Ventura, CA, January 2015*

1. "Manganese K-edge X-ray absorption and emission spectroscopy reveals mechanisms of O-O bond activation." *Poster, Metals in Biology Gordon Research Conference, Ventura, CA, January 2015*

TEACHING AND MENTORING

Postdoctoral Mentor, Lawrence Berkeley National Laboratory
Matthew Flick, UC Berkeley Undergraduate (Neurobiology & Molecular and Cell Biology)
Shea O'Sullivan, UC Berkeley Undergraduate (Chemistry)

Predoctoral Instructor, University of Washington
CHEM 142 – General Chemistry (Quarter 1 of 3) **** Instructor of record***

Teaching Assistant, University of Washington
CHEM 317 – Inorganic Chemistry Laboratory
CHEM 312 – Inorganic Chemistry (+ Guest Lecturer)
CHEM 162 – General Chemistry (Quarter 3 of 3) – Lead Teaching Assistant
CHEM 152 – General Chemistry (Quarter 2 of 3)
CHEM 120 – Introduction to General Chemistry

X-ray Spectroscopy Workshop Instructor
2018 CHESS Users' Meeting, Cornell University
2016 Bioinorganic Chemistry Workshop, Penn State University
2015 CHESS Users' Meeting, Cornell University

Graduate Student Mentor, University of Washington
Kaylee McClure, UW Undergraduate (now Radiochemistry PhD program, UNLV)

Discussion Section Leader, Goucher College
CHE 151 – Principles of Chemistry II
CHE 111 – Principles of Chemistry I

PROFESSIONAL MEMBERSHIPS, SERVICE, AND EXTRACURRICULAR

American Chemical Society – *Member*
Society of Biological Inorganic Chemistry – *Member*

Journal of the American Chemical Society – Reviewer
LBNL Chemical Sciences Division Diversity, Equity, & Inclusion Committee – *Member, 2018 – Current*
UW Faculty Council on Faculty Affairs – *Graduate Student Representative, 2012 – 2016*
UW Chemistry Graduate Student Club, *Officer, 2011 – 2013*
Goucher College Student Judicial Review Board, *Member, 2006 – 2008*

NCAA and US Soccer Federation Referee and Referee Instructor
US Sailing Member and Community Sailing Instructor