Katlyn Kelli Meier
Office Phone: 305-284-9807
Email: kmeier@miami.edu
Current Academic Rank: Tenure-track Assistant Professor
Primary Department: Chemistry

HIGHER EDUCATION

Carnegie Mellon University – Doctor of Philosophy in Chemistry – May 17, 2015
University of Pittsburgh & Carnegie Mellon University – N/A – August 2009-Summer 2010
Allegheny College – Bachelor of Science Degree in Physics, Minor: Philosophy – May 10, 2009

EXPERIENCE

University of Miami, Department of Chemistry August 2019-Present
Coral Gables, FL
Tenure-track Assistant Professor

Stanford University, Department of Chemistry July 2015-August 2019
Stanford, CA
Postdoctoral Research Fellow

Carnegie Mellon University, Chemistry Department Summer 2010-May 2015
Pittsburgh, PA
Graduate Student Researcher;

University of Pittsburgh School of Medicine, MBSB department Summer 2008/Summer 2009
Pittsburgh, PA
Research Intern

Allegheny College Physics Department Fall 2008-Spring 2009
Meadville, PA
Undergraduate Researcher

PUBLICATIONS

Juried or refereed journal articles and exhibitions:

[1] Paulino, V.; Mukhopadhyay, A.; Tsironi, I.; Liu, K.; Husainy, D.; Liu, C.; **Meier, K.***; Olivier, J.-H.* "Molecular Engineering of Water-Soluble Oligomers to Elucidate Radical π–Anion Interactions in n-Doped Nanoscale Objects." *J. Phys. Chem. C.* **2021**, *125*, 19, 10526-10538.

[2] Jones, S. M.; Transue, W. J.; **Meier, K. K.**; Kelemen, B.; Solomon, E. I. "Kinetic Analysis of Amino Acid Radicals Formed in H2O2-Driven Cu^{I} LPMO Reoxidation Implicates Dominant Homolytic Reactivity." ***Proc. Natl. Acad. Sci.* 2020,** *117*, 11916-11922.

[3] Appel, M. J.*; **Meier, K. K.***; Lafrance-Vanasse, J.; Lim, H.; Tsai, C.-L.; Tainer, J. A.; Solomon, E. I.; Bertozzi, C. R.; "The formylglycine-generating enzyme binds substrate directly at a mononuclear Cu(I) center to initiate O2 activation" (*co-first authors) ***Proc. Natl. Acad. Sci.* 2019,** *116*, 5370-5375. (Highlighted in: Schilter, D. ***Nature Reviews Chemistry* 2019,** *3*, 203.)

[4] **Meier, K.**; Jones, S.; Kaper, T.; Hansson, H.; Koetsier, M.; Sarkehabadi, S.; Solomon, E.; Sandgren, M.; Keleman, B. "Oxygen activation by Cu LPMOs in recalcitrant carbohydrate polysaccharide conversion to monomer sugars." ***Chem. Rev.* 2018**, *118*, 2593-2635.

[5] Hansson, H.; Karkehabadi, S.; Mikkelsen, N.; Douglas, N.; Kim, S.; Lam, A.; Kaper, T.; Kelemen, B.; **Meier, K. K.**; Jones, S. M.; Solomon, E. I.; Sandgren, M. "A lytic polysaccharide monooxygenase from Hypocrea jecorina with a structurally defined linker sequence." ***J. Biol. Chem.* 2017**, *292*, 19099-19109.

[6] **Meier, K. K.**; Rogers, M.; Kovaleva, E. G.; Lipscomb, J. D.; Münck, E. Bominaar, E. "Enzyme Substrate Complex of the H200C Variant of Homoprotcatechuate 2,3-Dioxygenase: Mossbauer and Computational Studies." ***Inorganic Chemistry.* 2016**, *55*, 5862-5870.

[7] **Meier, K. K.**; Rogers, M.; Kovaleva, E. G.; Bominaar, E.; Lipscomb, J. D.; Münck, E. "A Long-Lived Fe(III)-(Hydroperoxo) Intermediate in the Active H200C Variant of Homoprotocatechuate 2,3-Dioxygenase: Characterization by Mossbauer, Electron Paramagnetic Resonance, and Density Functional Theory Methods." ***Inorganic Chemistry.*** **2015**, *54,* 10269-10280.

[8] Prakash, J.; Rohde, G. T.; **Meier, K. K.**; Münck, E.; Que Jr., L. "Upside Down! Crystallographic and Spectroscopic Characterization of an $[Fe^{IV}(O_{syn})(TMC)]^{2+}$ Complex." ***Inorganic Chemistry.*** **2015**, *54,* 11055-11057.

[9] Serrano-Plana, J.; Oloo, W. N.; Acosta-Rueda, L.; **Meier, K. K.**; Verdejo, B.; Garcia-Espana, E.; Basallote, M. G.; Münck, E.; Que, Jr., L.; Company, A.; Costas, M. "Trapping a Highly Reactive Nonheme Iron Intermediate That Oxygenates Strong C-H Bonds with Stereoretention." ***J. Am. Chem. Soc.*** **2015**, *137,* 15833-15842.

[10] Prakash, J.; Rohde, G. T.; **Meier, K. K.;** Jasniewski, A. J.; Van Heuvelen, K. M.; Münck, E.; Que, Jr., L. **"**Spectroscopic identification of an Fe(III) center, not Fe(IV), in the crystalline Sc-O-Fe adduct derived from $[Fe(IV)(O)(TMC)]^{2+}$. ***J. Am. Chem. Soc.*** **2015**, *137,* 3478-3481.

[11] Biswas, A. N.; Puri, M. **Meier, K. K.**; Oloo, W. N.; Rohde, G. T.; Münck, E.; Que, Jr., L. "Modeling TauD-J: a high-spin nonheme oxoiron(IV) complex with high reactivity toward C-H bonds." ***J. Am. Chem. Soc.*** **2015**, *137,* 2428-2431.

[12] Makris, T. M.; Vu, V. V.; **Meier, K. K.**; Komor, A. J.; Rivard, B. S.; Münck, E.; Que, Jr., L.; Lipscomb, J. D. "An Unusual Peroxo Intermediate of the Arylamine Oxygenase of the Chloramphenicol Biosynthetic Pathway." ***J. Am. Chem. Soc.*** **2015**, *136,* 1608-1617.

[13] *Liu, J.; **Meier, K.**; Tian, S.; Zhang, J.; Guo, H.; Schulz, C. E.; Robinson, H.; Nilges, M. J.; Münck, E.; Lu, Y. "Redesigning an Electron Transfer Protein into a Mononuclear Non-heme Iron Enzyme: Preparation and Study of Fe(II)-M121E Azurin." ***J. Am. Chem. Soc.*** **2014**, *136*, 12337-12344. *Co-first authors

[14] Chiang, C.-W.; Kleespies, S. T.; Stout, H. D.; **Meier, K. K.**; Li, P.-Y.; Bominaar, E. L.; Que, Jr., L.; Münck, E.; Lee, W.-Z. "Characterization of a Paramagnetic Mononuclear Nonheme Iron-Superoxo Complex." ***J. Am. Chem. Soc.*** **2014**, 136, 10846-10849.

[15] England, J.; Bigelow, J.O.; Van Heuvelen, K.M.; Farquhar, E.R.; Martinho, M.; **Meier, K.K.**; Frisch, J.R.; Münck, E.; Que, Jr., L. "An Ultra-Stable Oxoiron(IV) Complex and Its Blue Conjugate Base." ***Chem. Sci.*** **2014**, 5, 1204-1215.

[16] Oloo, W.N.; **Meier, K.K.**, Münck, E., Que Jr., L. "Identification of a low-spin acylperoxoiron(III) intermediate in bio-inspired non-heme iron-catalysed oxidations." ***Nature Commun.*** **2014**, *5*, 3046.

[17] Li, F.; Van Heuvelen, K.M.; **Meier, K.K.**; England, J.; Münck, E.; Que, Jr., L. "Sc^{3+} triggered oxoiron(IV) formation from O_2 and its nonheme iron(II) precursor via a Sc^{3+}-peroxo-Fe^{3+} intermediate." ***J. Am. Chem. Soc.*** **2013**, *135*, 10198-10201.

[18] Banerjee, R.; **Meier, K.K.**; Münck, E.; Lipscomb, J.D. "Intermediate P* from Soluble Methane Monooxygenase Contains a Diferrous Cluster." ***Biochemistry.*** **2013**, *52*, 4331-4342.

[19] Mbughuni, M.M.; **Meier, K.K.**; Münck, E.; Lipscomb, J.D. "Substrate-Mediated Oxygen Activation by Homoprotocatechuate 2,3-Dioxygenase: Intermediates Formed by a Tyrosine 257 Variant." ***Biochemistry*****.** **2012**, *51*, 8743-8754.

[20] Cranswick, M.A.; **Meier, K.K.**; Shan, X.; Stubna, A.; Kaizer, J.; Mehn, M.P.; Münck, E.; Que, Jr., L. "Protonation of a Peroxodiiron(III) Complex and Conversion to a Diiron (III/IV) Intermediate: Implications to Proton-assisted O-O Bond Cleavage in Nonheme Diiron Enzymes." ***Inorganic Chemistry*****.** **2012**, *5*, 10417-10426.

[21] Van Heuvelen, K.M.; Fiedler, A.T.; DeHont, R.; Shan, X.; **Meier, K.K.**; Bominaar, E.; Münck, E.; Que, Jr. L. "One-electron oxidation of an oxoiron(IV) complex to form an $[O=Fe^{V}=NR]^{+}$ center." ***Proc. Ntl. Acad. Sci*****.** **2012**, *109*, 11933-11938.

[22] Mbughuni, M.M.; Chakrabarti, M.; Hayden, J.A.; **Meier, K.K.**; Dalluge, J.J.; Hendrich, M.P.; Münck, E.; Lipscomb, J.D. "Oxy-intermediates of homoprotocatechuate 2,3-dioxygenase: facile electron transfer between substrates." ***Biochemistry*****.** **2011**, *50*, 10262-10274.

[23] Li, F.; **Meier, K.K.**; Cranswick, M.A.; Chakrabarti, M.; Van Heuvelen, K.M.; Münck, E.; Que, Jr., L. "Characterization of a High-Spin Non-Heme Fe^{III}-OOH Intermediate and Its Quantitative Conversion to an Fe^{IV}=O Complex." ***J. Am. Chem. Soc.* 2011**, *133*, 7256-7259.
[24] Walsh, J.D.; **Meier, K.**; Ishima, R.; Gronenborn, A.M. "NMR Studies on Domain Diffusion and Alignment in Modular GB1 Repeats." ***Biophysical Journal*. 2010**, *99*, 2636-2646.

PROFESSIONAL

Funded Research Performed (in the last five years):

- The Miami Clinical Translational Science Institute (CTSI) Mentored Translational Research Scholars Program Awards (KL2) for the fiscal years FY2021-2022; 75% protected research time, $65,000; K.K.M as P.I.
- Frost Junior Fellows Program; K.K.M. as P.I. and R. Grace Zhai as co-P.I.; $30,000
- Ruth L. Kirschstein National Research Service Award F32GM116240; K.K.M. as P.I.; $157,290

Editorial responsibilities:

- Reviewer for *Biochemistry*
- Reviewer for *Angewandte de Chemie*
- Reviewer for *ACS Catalysis*

Professional and Honorary Organizations:

- Member, American Chemical Society; 2010-Present
- Member, National Physics Honor Society, Sigma Pi Sigma; 2007-2009
- Member, National Philosophy Honor Society, Phi Sigma Tau; 2007-2009
- Member, Clinical Translational Science Institute (CTSI) Connections Group 2020-present
- Member of the Association for Women in Science, Palo Alto Chapter 2017-2019

Honors and Awards:

- Miami Clinical & Translational Research Institute KL2 Mentored Translational Research Scholar (February 2021- January 2023)
- Frost Junior Fellow (January 2020-January 2022)
- Recipient, travel award to attend the Gordon Research Conference on Metallocofactors (June 2018)
- Recipient, Ruth L. Kirschstein National Research Service Award (NRSA) - F32 Fellowship for Postdoctoral Scholars (July 2015-July 2018)
- Recipient, GSA/Provost Conference Funding Travel Award (Summer 2014)
- Recipient, GSA/Provost Conference Funding Travel Award (Summer 2013)
- Recipient, Edwin N. Lassettre Fund for Chemistry Graduate Student Travel Award (Summer 2013)
- Recipient, GSA/Provost Conference Funding Travel Award (Summer 2011)
- Jonathan Lee Rusk Memorial Prize for the outstanding senior research project in experimental Physics (2009)
- Allegheny College Alden Scholar (2006-2009)
- Academic Excellence Achievement Scholarship Recipient (2005-2009)

Other Professional Activities (e.g., papers presented; seminar or conference panel member; etc.):

Invited Talks:

[1] **Meier, K.K.** (4 June 2020) "Defining the Role of Copper in Neurodegenerative Disease Progression and Exploring its Potential as a Druggable Target", University of Miami, Frost Junior Fellows Symposium

[2] **Meier, K.K.** (4 February 2019) "Spectroscopic characterization of unique iron and copper active sites in biology", Northwestern University, Chemistry Department Seminar

[3] **Meier, K.K.** (15 January 2019) "Spectroscopic characterization of unique iron and copper active sites in biology", University of Washington, Chemistry Department Seminar

[4] **Meier, K.K.** (7 January 2019) "Spectroscopic characterization of unique iron and copper active sites in biology", University of Wisconsin, Milwaukee, Chemistry Department Seminar

[5] **Meier, K.K.** (17 December 2018) "Spectroscopic characterization of unique iron and copper active sites in biology", University of North Carolina, Chapel Hill, Chemistry Department Seminar.

[6] **Meier, K.K.** (13 December 2018) "Spectroscopic characterization of unique iron and copper active sites in biology", University of Miami, Coral Gables, Chemistry Department Seminar

[7] **Meier, K.K.** (10 December 2018) "Spectroscopic characterization of unique iron and copper active sites in biology", West Virginia University, Chemistry Department Seminar

[8] **Meier, K.K.** (6 December 2018) "Spectroscopic characterization of unique iron and copper active sites in biology", University of Chicago, Chemistry Department Seminar

[9] **Meier, K.K.** (4 December 2018) "Spectroscopic characterization of unique iron and copper active sites in biology", University of Illinois, Chicago, Chemistry Department Seminar

[10] **Meier, K.K.** (29 November 2018) "Spectroscopic characterization of unique iron and copper active sites in biology", University of Michigan, Chemistry Department Seminar

[11] **Meier, K.K.** (23 August 2017) "New Insight into the Reaction Mechanism of the Formylglycine Generating Enzyme: A spectroscopic perspective." **254th ACS National Meeting and Exposition**, Inorganic Division held in Washington, D.C.

[12] **Meier, K.K.** (6 December 2013) "Studies of an Fe(II) dioxygenase and its intermediates using Mössbauer Spectroscopy and DFT." **9th Annual Mini-Symposium on Metals in Biological Systems** held at Duquesne University, Pittsburgh, PA.

[13] **Meier, K.K.** (20 June 2013) "At the Frontier of Oxygen Activation Chemistry: The hunt for Fe^{V}=O Centers." Chemistry Graduate Student Seminar Series at Carnegie Mellon University, Pittsburgh, PA.

[14] **Meier, K.K.** (2 November 2012) "The New Frontier: Novel Fe^{V}=O Centers." Research was presented in a **60-minute lecture** as part of the **joint Physics/Chemistry seminar series at Allegheny College**, Meadville, PA.

[15] **Meier, K.K.** (June 2012) "Spectroscopic Characterization of Novel Fe^{V}=O Centers." Research was presented at the **Pennsylvania State University Bioinorganic Training Workshop** in an **invited 75-minute talk** including real-time tutorials for an audience of 70+ graduate students and post-docs and 10+ faculty, State College, PA.

[16] **Meier, K.K.**; Van Heuvelen, K.M.; Fiedler, A.T.; DeHont, R.; Shan, X.; Bominaar, E.; Münck, E.; Que, Jr., L. (27 January 2012) "One-electron Oxidation of an Oxoiron(IV) Complex." Research was presented at the **Gordon Research Seminar** as a **30-minute talk**, Ventura, CA.

[17] **Meier, K.K.** (6 October 2011) "Enhancing the Information Content of EPR Using High-Frequency Techniques." Presented in the Graduate Seminar series as a **45-minute talk**, Carnegie Mellon University, Pittsburgh, PA.

[18] **Meier, K.K.**; Walsh, J.; Ishima, R. (1 August 2008) "Determination of Backbone Dynamics in Single and Dual Domain Protein GB1: Comparison in the Presence and Absence of Alignment Media." Research was presented at the University of Pittsburgh Summer Undergraduate Research Conference held in Pittsburgh, PA.

Poster Presentations:

[1] **Meier, K. K.**; Appel, M. J.; Lim, H.; Bertozzi, C. R.; Solomon, E. I. (12 June 2018) "New Insight into the Reaction Mechanism of the Formylglycine Generating Enzyme and its Requirements for O_2 Activation." 2018 Metallocofactors Gordon Research Conference. Mount Holyoke College, South Hadley, MA.

[2] **Meier, K. K.**; Rogers, M.; Kovaleva, E. G.; Bominaar, E.; Münck, E.; Lipscomb, J.D. (10 August 2014) "Characterization of a new, long-lived intermediate in H200C homoprotocatechuate 2,3 dioxygenase by Mossbauer, EPR, and DFT methods." 248th ACS National Meeting and Exposition – Inorganic Division, San Francisco, CA.

[3] **Meier, K. K.**; Mbughuni, M.M.; Münck, E.; Lipscomb, J.D. (3 April 2014) "Mössbauer and Density Functional Theory Characterization of Two Short-Lived Intermediates in the Catalytic Cycle of Y257F Homoprotocatechuate 2,3-Dioxygenase." Innovation with Impact Research Exhibition, Carnegie Mellon University, Pittsburgh, PA.

[4] **Meier, K.K.**; Mbughuni, M.M.; Münck, E.; Lipscomb, J.D. (22-27 July 2013) "Probing the Reaction Cycle of Y257F Homoprotocatechuate 2,3 Dioxygenase: Mössbauer and Density Functional Theory characterization of two short-lived intermediates." **16th International Conference on BioInorganic Chemistry**, Grenoble, France.

[5] **Meier, K.K.**; Van Heuvelen, K.M.; Fiedler, A.T.; DeHont, R.; Shan, X.; Bominaar, E.; Münck, E.; Que, Jr., L. (31 May 2012-9 June 2012) "Spectroscopic Characterization of Novel Fe^{V}=O Centers." The Pennsylvania State University Bioinorganic Training Workshop, State College, PA.

[6] **Meier, K.K.**; Li, F.; Cranswick, M.A.; Chakrabarti, M.; Van Heuvelen, K.M.; Münck, E.; Que, Jr., L. (5 April 2012) "Characterization of a High-Spin Nonheme FeIII–OOH Intermediate and Its Conversion to an FeIV=O Complex." Innovation with Impact Research Exhibition, Carnegie Mellon University, Pittsburgh, PA.

[7] **Meier, K.K.**; Van Heuvelen, K.M.; Fiedler, A.T.; DeHont, R.; Shan, X.; Bominaar, E.; Münck, E.; Que, Jr., L. (25-28 January 2012) "One-electron Oxidation of an Oxoiron(IV) Complex." Gordon Research Seminar, Ventura, CA.

[8] **Meier, K.K.**; Li, F.; Cranswick, M.A.; Chakrabarti, M.; Van Heuvelen, K.M.; Münck, E.; Que, Jr., L. (10 August 2011) "Characterization of a High-Spin Nonheme Fe^{III}–OOH Intermediate and Its Conversion to an Fe^{IV}=O Complex." **15th International Conference on Bio Inorganic Chemistry**, Vancouver, BC Canada.

[9] **Meier, K.K.**; Nocera, T.; Abood, R.; Chen, M.; Hilfiger, M.; Petasis, D.; Achim, C.; Dunbar, K. (16-20 March 2009) "Electron Paramagnetic Resonance Spectroscopic Studies of Cyanide-Bridged Fe/Os and Fe/Ru Clusters." 2009 APS March Meeting, Pittsburgh, PA.

[10] **Meier, K.K.**; Walsh, J.; Ishima, R. (17 October 2008) "Determination of Backbone Dynamics in Single and Dual Domain Protein GB1: Comparison in the Presence and Absence of Alignment Media." Allegheny College Inaugural Symposium, Meadville, PA.

TEACHING

Teaching Specialization

- University of Miami, Chemistry Department; CHM121 – E – Principles of Chemistry; Spring 2021 – 150 students, in-person lecture.
- University of Miami, Chemistry Department; CHM556/ CHM665 – Principles of Spectroscopic Techniques; Fall 2020 – redesigned the course, modified assessments, six-student enrollment.
- University of Miami, Chemistry Department; CHM556/ CHM665 – Principles of Spectroscopic Techniques; Fall 2019 – developed new course and incorporated more active learning components
- Carnegie Mellon University, Chemistry Department; Teaching Assistant – Mathematical Methods for Chemists; Fall 2010, 2011, 2012
- Carnegie Mellon University, Chemistry Department; Teaching Assistant – Physical Chemistry for Biologists; Spring 2012
- Carnegie Mellon University, Chemistry Department; Teaching Assistant – Physical Chemistry Thermodynamics; Spring 2011

Thesis and Dissertation Advising/Post-doctoral student supervision:

Thesis advisor to: Deepa Neupane – *Graduate student* – "Defining the role of copper in neurodegenerative disease progression – a look at the interaction of copper with huntingtin protein."
Prajakta Badve – *Graduate student* – "Spectroscopic characterization of heme protein-protein interactions promoting chemoresistance."
Kassidy Rodriguez – *Graduate student* – Thesis title TBD

Research Advisor to: Elliott Cleven – *Undergraduate student*
Alfred Shomar – *Undergraduate student*
Allison Kelley – *Undergraduate student*
Alyssa Francis – *Undergraduate student*

Thesis committee member to: Brianna Bernard – Olivier Group
Nermina Brljak – Knecht Group
Caroline Velez – Acevedo Group
Ifigeneia Anais Tsironi Tzinious – Olivier Group
Emel Kirbas Cilingir – Leblanc Group
Braulio Carrera Loureiro B Ferreira – Leblanc Group
Yuliana Perdomo – Knecht Group
Justin Domena – Leblanc Group
Lukun Wang – Prabhakar Group

SERVICE

University Committee and Administrative Responsibilities:

- Member of the 2020 Polymer Faculty Search Committee.
- Member of the 2020 Graduate Student Admissions Committee.
- Member of the 2020/2021 Graduate Student Committee.
- Member of the 2020 and 2021 review panels for the University Maytag Fellowship.
- Reviewer for the 2020-2021 Provost Research Award proposals.
- Spokesperson for the Department of Chemistry Chairmanship decision
- Member of the University of Miami, Department of Chemistry Graduate Student Recruitment Committee

Community Activities:

- Judge for the College of Arts & Sciences Internal 3MT Competition; November 20, 2019
- Member of the Association for Women in Science, Palo Alto Chapter; 2017-2019