BRIAN C. SANDERS

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Education and Training:

2019, NIH Postdoctoral Fellow, Bioinorganic Chemistry, Caltech
2015, PhD Chemistry and Bioinorganic Chemistry, University of Georgia
2008, B.S. in Chemistry, University of Tennessee

Research and Professional Experience:

2021 – Present, Faculty of the Bredesen Center for Interdisciplinary Research and Graduate Education
2019 – Present, Staff Scientist, R&D, Oak Ridge National Laboratory
2017 – 2019, NIH Ruth Kirchstein NRSA Postdoctoral Fellow at Caltech
2015 – 2016, Postdoctoral Researcher at Caltech
2008 – 2015, Doctoral program at University of Georgia, Chemistry and Bioinorganic Chemistry
2005 – 2008, SULI programs and Contracted Research, Oak Ridge National Laboratory
2004 – 2008, University of Tennessee Undergraduate Research

Honors and Awards:

2017 NIH Ruth Kirchstein NRSA Postdoctoral Fellow at Caltech
2015 Martin Reynolds Smith Award Endowed by the family of Martin R. Smith University of Georgia
2014 Mary Laraine Young Hines Graduate Fellowship in Cancer Research
2009 Kenneth W. Whitten Award for Outstanding Teaching Assistant

Publications:

1. Potent and selective covalent inhibition of the papain-like protease from SARS-CoV-2 Sanders, B.C.*, Pokhrel, S., Labbe, A.D. *et al*. *Nat Commun.* **2023**, 14, 1733.
2. Developmental Changes in Lignin Composition are Driven by Both Monolignol Supply and Laccase Specificity Developmental Changes in Lignin Composition are Driven by Both Monolignol Supply and Laccase Specificity. Chunliu Zhuo; Xin Wang; Maite Docampo-Palacios; Brian C. Sanders; Nancy L. Engle; Timothy J. Tschaplinski; John H. Rajeswaran; Costas Maranas; Fang Chen; Richard A. Dixon. *Sci. Adv.* **2022**, 8, eabm8145.
3. Cyano-Ambivalence: Spectroscopy and Photophysics of $[Ru(diimine)(CN\text{-}BR_3)_4]^{2-}$ Complexes. Danh Ngo, Sarah A. Del Ciello, Brendon J. McNicholas, Brian C. Sanders, Javier Fajardo, Harry B. Gray, Jay R. Winkler. **2020**, *Polyhedron*, 188, 114692.
4. Structure determination of the HgcAB complex using metagenome sequence data: insights into microbial mercury methylation. Connor J Cooper, Kaiyuan Zheng, Katherine W Rush, Alexander Johs, Brian C Sanders, Georgios A Pavlopoulos, Nikos C Kyrpides, Mircea Podar, Sergey Ovchinnikov, Stephen W Ragsdale, Jerry M Parks. **2020**, *Communications Biology*, 3, 1.
5. Hole Hopping through Cytochrome P450. Mette L. H. Sørensen†, Brian C. Sanders†, Lillian P. Hicks, Maria H. Rasmussen, Andreas L. Vishart, Jacob Kongsted, Jay R. Winkler, Harry B. Gray, Thorsten Hansen. **2020**, *Journal of Physical Chemistry B*, 124, 3065.
6. Overview and New Insights into the Thiol Reactivity of Coordinated NO in $\{MNO\}^{6/7/8}$ (M = Fe, Co) Complexes. Rhine, M.A.†; Sanders, B. C.†; Patra, A.K.; Harrop, T. C. *Inorg. Chem.* **2015**, *54*, 9351-9366.
7. Catalytic Reduction of NO_2^- from a Non-heme NiR Model Complex. Sanders, B. C.; Hassan, S.M; Harrop, T. C. *J. Am. Chem. Soc*. **2014**, *136*, 10230-10233.

8. Properties of $\{FeNO\}^8$ and $\{CoNO\}^9$ Metal Nitrosyls in Relation to Nitroxyl Coordination Chemistry. Sanders, B. C.; Rhine, M. A.; Harrop, T. C. *Struct. Bond.* **2014**, *160*, 57-88.
9. Synthesis, Properties, and Reactivity of a Series of Non-heme $\{FeNO\}^{7/8}$ Complexes: Implications for Fe-nitroxyl Coordination. Sanders, B. C.; Patra, A. K.; Harrop, T. C. *J. Inorg. Biochem.* **2013**, *118*, 115-127.
10. A Thermally Stable $\{FeNO\}^8$ Complex: Properties and Biological Reactivity of Reduced MNO Systems Patra, A. K.; Dube, K. S.; Sanders, B. C.; Papaefthymiou, G. C.; Conradie, J.; Ghosh, A.; Harrop, T. C. *Chem. Sci.* **2012**, *3*, 364-369.
11. Exploring the Intermediates of Photochemical CO_2 Reduction: Reaction of $Re(dmb)(CO)_3COOH$ with CO_2. Agarwal, J.; Sanders, B. C.; Fujita, E.; Schaefer III, H. F.; Harrop, T. C.; Muckerman, J. T. *Chem. Commun.* **2012**, *48*, 6797-6799.
12. Metal-Free Sequential [3 + 2]-Dipolar Cycloadditions using Cyclooctynes and 1,3-Dipoles of Different Reactivity. Sanders, B. C.; Friscourt, F.; Ledin, P. A.; Mbua, N. E.; Arumugam, S.; Guo, J.; Boltje, T. J.; Popik, V. V.; Boons, G.-J. *J. Am. Chem. Soc.* **2011**, *133*, 949-957.
13. Synthesis of a Glycodendrimer Incorporating Multiple Mannosides on a Glucoside Core. Wang, C.; Sanders, B.; Baker, D. C. *Can. J. Chem.* **2011**, *89*, 959-963.

Intellectual Property:

1. Metal-Free Sequential [3 + 2]-Dipolar Cycloadditions using Cyclooctynes and 1,3-Dipoles of Different Reactivity, by B.C. Sanders; F. Friscourt; P.A. Ledin; E.N. Mbua; S. Arumugam; J. Guo; T.J. Boltje; V.V. Popik; and G.J. Boons. U.S. Provisional Patent Application. Serial No.: 61/386,841 (September 27, 2010).
2. Covalent Inhibitors of Coronavirus Papain-like Protease, Sanders, B.C.; Galanie, S.; Park, J. U.S. Full Patent Application Serial No. 63/237,578. Filed: August 26, 2022.

Recent Invited Presentations:

1. International Conference on Biological Inorganic Chemistry; The development of a high-throughput workflow for the design and screening of metalloproteins for critical materials isolation; July 2023
2. Southeastern Regional Meeting of the American Chemical Society; Potent and selective covalent inhibition of the papain-like protease from SARS-CoV-2; Oct. 2022

Synergistic Activities:

Adjunct reviewer for Carbon Capture, Storage, and Utilization
Member of the Society for Biological Inorganic Chemistry
Member of the American Chemical Society
Subject matter expert for BRaVE pre-proposal review committee ORNL (2023)
Subject matter expert for Energy Earthshot pre-proposal review committee ORNL (2023)
Judge at the INTEL International Science and Engineering Fair (INTEL ISEF), Los Angeles, CA, 2017
Volunteer for the NSF Center for Chemical Innovation (NSF-CCI) Solar Army, 2015
Volunteer at San Diego Festival of Science and Engineering, 2015

Graduate and Postdoctoral Advisors:

Graduate Advisor – Todd C. Harrop (University of Georgia)
Postdoctoral Advisor – Harry B. Gray (Caltech)

Advisees:

Former undergraduate students – S. Thomas (ORNL, MES Program, Claflin University), M. Mariano (ORNL SULI, Ohio Northern University), J. Trower (ORNL HERE/N. Carolina Central U.), C. Consoli (ORNL SULI/Northeastern U.), T. Sheridan (Caltech/Northwestern), E. Shekarabi (University of Georgia)