

## **Sarah Sewell Pierce, Ph.D.**

Lecturer

Middle Tennessee State University

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### **Education:**

- 2003 - 2007      Doctor of Philosophy, Chemistry, Vanderbilt University, Nashville, Tennessee
- 2014 - 2016      Master of Arts, Education, Cumberland University, Lebanon, Tennessee
- 1999 - 2003      Bachelor of Science, Chemistry, *magna cum laude*, The University of Tennessee at Chattanooga, Chattanooga, Tennessee

### **Professional Experience:**

- 2023 – present      **Lecturer**  
Middle Tennessee State University  
Laboratory Coordinator for Introduction to General Chemistry I and II (GOB series)  
*Teaching Experience: Introduction to General Chemistry I, Introduction to General Chemistry II, Organic Chemistry I, Chemistry for Consumers: Art*
- 2020-2023      **Program Director of Biochemistry and Chemistry and Professor of Chemistry**  
Cumberland University (CU)  
*Teaching Experience: The Fundamentals of Chemistry (both online and in person), Chemistry in Art, Chemical Literature, General Chemistry I and II, Organic Chemistry I and II, Biochemistry, and Advanced Biochemistry, Analytical Chemistry, ED5857W: Chemistry on a Shoestring: Secondary Science Teachers*
- 2017 - 2020      **Program Director of Biochemistry and Associate Professor of Chemistry**  
Cumberland University
- 2008-2017      **Program Director of Biochemistry and Assistant Professor of Chemistry**  
Cumberland University
- 2013 – 2014      **Upper School Science Teacher (Sabbatical)**  
Harpeth Hall School  
*Teaching Experience: 9<sup>th</sup> grade Biology, 10<sup>th</sup> and 11<sup>th</sup> grade Chemistry, 10<sup>th</sup> grade Honors Chemistry*
- 2007-2008      **Postdoctoral Research with Todd D. Giorgio**  
Biomedical Engineering Department, Vanderbilt University  
*The Synthesis of Surface Functionalized Nanoparticles for Proximity-Activated Detection and Imaging of Breast Cancer*  
*Teaching Experience: Biomedical Engineering 281L (Nanobiotechnology Laboratory) Instructor, Biomedical Engineering 281 (Nanobiotechnology) Lecturer*
- 2003-2006      **Graduate Research with David W. Wright**  
Chemistry Department, Vanderbilt University

*Biomimetic Synthesis of Metal Oxide Nanoparticles Mediated by Peptides and Polymers*  
*Teaching Experience: General Chemistry Laboratory Teaching Assistant*

2001-2003

**Undergraduate Research with Kyle S. Knight**

The University of Tennessee at Chattanooga

*A Mechanistic Study of Palladium Catalyzed Dehalogenation*

**Career Honors and Awards:**

2021 CU Faculty/Staff Homecoming Representative Nominee (student nominated)  
2021 CU Most Outstanding Faculty Award Nominee (student nominated)  
2020 CU Most Outstanding Faculty Award Nominee (student nominated)  
2013 CU Most Outstanding Faculty Award Nominee (student nominated)  
2012 CU Liberal Arts and Sciences Outstanding Faculty Award (faculty nominated)  
2011 CU Most Outstanding Faculty Award Nominee (student nominated)  
2008 Fellowship for STEMES Education Scholars Program (VU)  
2003 GAANN Fellowship (VU)  
2003 American Institute of Chemists Award (UTC)

**Professional Organizations:**

2003 - present American Chemical Society, Chemical Education Division  
2011 – 2012 National Science Teachers Association  
2009 – 2011, 2015-2023 Tennessee Academy of Sciences  
2010 - 2011 American Society of Engineering Education

**Service at MTSU:**

2023 True Blue Core Liaison

**Service at CU:**

2021 – 2023 Academic Integrity Board  
2017 – 2023 Assessment Committee  
2019 – 2023 Safety Committee  
2008 – 2020 Pre-Professional Society Advisor  
2016 – 2023 Colloquium Committee (Chair from 2016 - 2019)  
2010 – 2020 University General Education Core Committee  
2017 – 2019 Promotion Committee  
2015 – 2017 Faculty Senate  
2015 Labry School of Science, Technology, and Business Mission Statement Committee  
2015 – 2017 Institutional Review Board  
2008 – 2012 School of Liberal Arts and Sciences Faculty Observation Committee  
2008 – 2012 Alpha Omicron Pi Faculty Advisor  
2008 – 2012 University Course, Curriculum and Academic Policy Committee (Secretary from 2010-2012)  
2008 – 2010 Academic Integrity Board (Secretary from 2008-2010)

**Funding**

2023 MTSU- EXL Equipment Grant (\$279.49 for a kiln for Chemistry for Consumers-Art)  
2022 CU Bone Research Grant (\$5000 for the project “Teaching Intermolecular Forces Using an Authentic Learning Experience”)  
2022 CU Charles and Elaine Bell Faculty Engagement and Student Development Grant 2022

(\$1200 for Mole Day and Darwin Day Speakers)

- 2021 CU Charles and Elaine Bell Faculty Engagement and Student Development Grant 2021 (\$1000 to attend the BCCE meeting in August of 2022)
- 2021 CU Dr. Bill McKee Academic Research Grant (\$1676 for the project “The Quantification of Capsaicin in Peppers”)
- 2018 CU Charles and Elaine Bell Faculty Engagement and Student Development Grant 2018 (\$2000 to attend the BCCE meeting in August of 2018)
- 2017 CU Charles and Elaine Bell Faculty Engagement and Student Development Grant 2017 (\$654 to attend the Pittcon meeting in March of 2017)
- 2017 Pittcon Promoting Excellence in Education Grant for a classroom set of visible spectrometers (\$4,788)
- 2016 CU Charles and Elaine Bell Faculty Engagement and Student Development Grant 2016 (\$966 to attend the BCCE meeting in August of 2016)
- 2016 cCWCS Implementation Grant for 2 Vernier Environmental Chemistry Equipment Packages (\$1000)
- 2016 American Chemical Society Passer Education Grant (\$800 to attend the cCWCS workshop on Chemistry in Art)
- 2015 American Chemical Society Chemical Education Travel Grant (\$1000 to attend the BCCE meeting in August of 2016)
- 2015 CU Charles and Elaine Bell Faculty Engagement and Student Development Grant 2014-2015 (\$500 to attend the cCWCS workshop on Environmental Chemistry)
- 2013 Middle Tennessee STEM Innovation Hub 2013 for Development of Science Teacher Workshops (\$5,000)
- 2012 CU Research Grant for the development of the research project “Utility of Computer Based Training in Supplemental Knowledge and Method Transfer.” (\$8,322)
- 2012 Tennessee Valley Authority Sponsorship for a Summer Science Camp (\$2,500)
- 2010 Nashville Predator’s Foundation Grant for the implementation of a science camp for sixth grade students. (\$2,500)
- 2010 Tennessee Valley Authority Sponsorship for a Summer Science Camp (\$1,000)

### **Workshops**

- 2016 Chemistry Collaborations, Workshops & Communities of Scholars  
Art as a Context for General Chemistry Workshop
- 2015 Chemistry Collaborations, Workshops & Communities of Scholars Environmental Chemistry Workshop

2014 Chemistry Collaborations, Workshops & Communities of Scholars Chemistry in Art Workshop

### **Community Outreach**

2021 Chemistry in Art: Developed and facilitated a workshop for area high school teachers

2013-2014 Chemistry on a Shoestring Budget, A Standard Based Chemistry Laboratory Concept and Technique Workshop: Developed and facilitated a workshop for area high school teachers based on Common Core Science Standards

2009 – 2010, 2012 Sixth Grade Summer Science Camp Director: Developed and facilitated chemistry, biology, and physics activities for sixth and seventh grade students

2011 – 2012 Science Olympiad Coach for Friendship Christian School

### **Consulting**

2022- present Advanced Placement Reader

2019- 2022 W. W. Norton Chemistry supporting information author

2017-2020 Study.com Content Author

2017 W.W. Norton Chemistry: Atoms First test bank reviewer

2017 W.W. Norton reviewer for the online homework system for Calculations in Chemistry

2016 W.W. Norton Biochemistry test question author

2015 Council for Aid to Education test question author

### **Presentations:**

“Teaching Intermolecular Forces Using an Authentic Learning Experience”, Kathleen Oliver, Julie Baker Phillips, Vichuda Hunter, and Sarah S. Pierce, Presented at the spring American Chemical Society national meeting, March 27<sup>th</sup>, 2023 virtually.

“Teaching Intermolecular Forces using Watercolor Paintings”, Kathleen Oliver, Julie Baker Phillips, Vichuda Hunter, and Sarah S. Pierce, Presented at the 132<sup>nd</sup> Tennessee Academy of Sciences Annual Meeting, November 18<sup>th</sup>, 2022 at Tennessee State University.

“Exposing Students to Diversity using Science History”, Braden W. Huff and Sarah S. Pierce, Presented at the 132<sup>nd</sup> Tennessee Academy of Sciences Annual Meeting, November 18<sup>th</sup>, 2022 at Tennessee State University.

“Superhero Science”, Sarah S. Pierce, Presented at the 27<sup>th</sup> Biennial Conference on Chemical Education, July 31<sup>st</sup> – August 1<sup>st</sup> in West Lafayette, IN.

“Determination of Concentrations of Food Dyes in Powdered Drink Mixes”, Madeline S. Herndon and Sarah S. Pierce, Presented at the 131<sup>st</sup> Tennessee Academy of Sciences Annual Meeting, November 6<sup>th</sup>, 2021 at Tennessee Tech University.

“Factors that Determine the Amount of Capsaicin in Jalapeño Peppers”, Sugeidy Sanchez-Xalate and Sarah S. Pierce, Presented at the spring American Chemical Society national meeting, April 15, 2020 virtually.

“Factors that Determine the Concentration of Capsaicin in Different Pepper Types”, Sugeidy Sanchez-Xalate and Sarah S. Pierce, Presented at the 130<sup>th</sup> Tennessee Academy of Sciences Annual Meeting, November 21, 2020 virtually.

“Foldable and Doodles in the Collegiate Classroom”, Sarah S. Pierce, Presented at the 129<sup>th</sup> Tennessee Academy of Sciences Annual Meeting, November 22, 2019 in Columbia, Tennessee.

“Culture through community: Engaging activities that build lasting relationships with students”, Julie Baker Phillips and Sarah S. Pierce, Presented at the 25<sup>th</sup> Biennial Conference on Chemical Education, July 29-August 2<sup>nd</sup>, 2018 in South Bend, Indiana.

“Foldables in general and organic chemistry”, Sarah S. Pierce. Presented at the 25<sup>th</sup> Biennial Conference on Chemical Education, July 29-August 2<sup>nd</sup>, 2018 in South Bend, Indiana.

“Using Art to Teach General and Organic Chemistry Laboratories”, Sarah S. Pierce. Presented at the 127<sup>th</sup> Tennessee Academy of Sciences Annual Meeting, November 17, 2017 in Martin, Tennessee.

“A Comparison of Antioxidant Content in Supplements and Common Fruit”, Kaitlin Kisiloski and Sarah S. Pierce. Presented at the 127<sup>th</sup> Tennessee Academy of Sciences Annual Meeting, November 17, 2017 in Martin, Tennessee.

“Quantitation of Formaldehyde Produced from Electronic Cigarettes by Different E-Juices”, Krista M. Gardner, Roland Landers, Sarah S. Pierce. Presented at Pittcon, March 5-9, 2017 in Chicago, Illinois.

“Quantitation of Formaldehyde Produced from Electronic Cigarettes by Different E-Juices”, Krista M. Gardner and Sarah S. Pierce. Presented at the 126<sup>th</sup> Tennessee Academy of Sciences Annual Meeting, November 19<sup>th</sup>, 2016 in Clarksville, Tennessee.

“The Assessment of a “Flipped” Pre-laboratory Lecture using a Multi-Rule Quality Control System (MRQCS)”, Sarah S. Pierce, Melissa D. Carter, Albert D. Dukes, III, Rebecca H. Brown, Aren E. Gerdon. Presented at the 24<sup>th</sup> Biennial Conference on Chemical Education, July 31- August 4, 2016 in Denver, Colorado.

“Using a little bit of make-believe: Teaching chemistry using laboratory experiments that are linked to the job market”, Sarah S. Pierce. Presented at the 24<sup>th</sup> Biennial Conference on Chemical Education, July 31- August 4, 2016 in Denver, Colorado.

“Determination of Formaldehyde Concentrations in Electronic Cigarettes”, Roland Landers and Sarah Pierce. Presented at Pittcon, March 6-10, 2016 in Atlanta, Georgia.

“Determination of Formaldehyde Concentrations in Electronic Cigarettes”, Roland Landers and Sarah Pierce. Presented at the 125<sup>th</sup> Tennessee Academy of Sciences Annual Meeting, November 20<sup>th</sup>, 2015 in Murfreesboro, Tennessee.

“Incorporating an Original Research Project into a General Chemistry II Laboratory Class”, Sarah Pierce. Presented at the 23<sup>rd</sup> Biennial Conference on Chemical Education, August 3-7, 2014 in Allendale, Michigan.

“Being a Lone Ranger: Thoughts from a Lone Chemist”, Sarah Pierce. Presented at the 23<sup>rd</sup> Biennial Conference on Chemical Education, August 3-7, 2014 in Allendale, Michigan.

“Making Musical Serialism Using Mass Spectrometry and Nuclear Magnetic Resonance”, Lain Tomlinson, Chris Fuller, and Sarah Pierce. Presented at the Southeastern Regional Meeting of the American Chemical

Society, November 14 – 17, 2012 in Raleigh, North Carolina.

“Incorporating Personal Response Systems or “Clickers” into a Fundamentals of Chemistry Class”, Sarah Pierce, 2012. Faculty development at Cumberland University.

“Advantages and Challenges of Incorporating a Blog into a Chemistry Class”, Sarah Pierce. Presented at the 22<sup>nd</sup> Biennial Conference on Chemical Education, July 29 – August 2, 2012 in University Park, Pennsylvania.

“Podcasting in Five Minutes”, Sarah Pierce. Presented at the 21<sup>st</sup> Biennial Conference on Chemical Education, August 1-5, 2010 in Denton, Texas. Also presented for Cumberland University Faculty in 2009 and 2010 as a professional development seminar.

“Nanoparticle Synthesis to Application: a Nanobiotechnology Lab Course for Biomedical Engineering”, Sarah Pierce, Amanda Lowery, Charleson Bell and Todd Giorgio. Presented at the 117<sup>th</sup> American Society for Engineering Education Conference, June 20-23, 2010 in Louisville, Kentucky (peer reviewed).

“Surface Functionalized Nanoparticles for Proximity-Activated Detection and Imaging of Breast Cancer”, Sarah L. Sewell and Todd D. Giorgio. Presented at the Department of Defense Era of Hope Meeting, June 25- June 28, 2008 in Baltimore, Maryland.

“Surface Functionalized Nanoparticles for Proximity-Activated Detection of Breast Cancer”, Sarah L. Sewell and Todd D. Giorgio. Presented at the Biomedical Engineering Society National Meeting, September 26-29, in Los Angeles, California.

“Biomimetic Synthesis of Metal Oxide Nanoparticles Utilizing PAMAM and PPI dendrimers”, Sarah L. Sewell, David W. Wright. Presented at the 231<sup>st</sup> National Meeting of the American Chemical Society, March 26-30, 2006 in Atlanta, Georgia.

“Dendrimer Mediated Synthesis of Metal Oxide Nanoparticles”, Sarah L. Sewell, David W. Wright. Presented at the 57<sup>th</sup> Southeast/61<sup>st</sup> Southwest Joint Regional Meeting of the American Chemical Society, November 1-4, 2005 in Memphis, Tennessee.

“Mechanistic Study of Palladium Catalyzed Dehalogenation”, Sarah L. Sewell, Kyle S. Knight. Poster Presentation at the 225<sup>th</sup> National Meeting of the American Chemical Society, March 23-27, 2003 in New Orleans, Louisiana.

### **Publications:**

“Factors that Determine the Amount of Capsaicinoids in Different Peppers” Adriana Sugeidy Sanchez-Xalate and Sarah S. Pierce. *Journal of the Tennessee Academy of Sciences*, **2024**, accepted.

“Determination of Concentration of Food Dyes in Powdered Drink Mixes” Madeline S. Herndon, Julie B. Phillips, and Sarah S. Pierce. *Spectrum Journal*, **2023**, 10, 1-7.

“Supplemental Learning in the Laboratory: An Innovative Approach for Evaluating Knowledge and Method Transfer” Carter, M. D; Pierce, S.S.; Dukes, A. D.; Brown, R.H.; Crow, B.S.; Shaner, R. L.; Heidari, L. M.; Perez, J. W.; Thomas, J.D.; Johnson, R.C.; Gerdon, A.E. *J. of Chem. Ed.*, **2017**, 94 (8), 1094-1097.

“Sweet Chemistry: A Study of the Intermolecular Forces in Candy Dye Molecules” Kara E. Paden and Sarah S. Pierce. *ALETHIA*, **2016**, 1, 1-8.

“Quantification of Quantum Dot Concentration using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)” Sewell, S.L.; Higgins, M. M.; Bell, C. S.; Giorgio, T.D. *Journal of Biomedical Nanotechnology*. **2011**, 7, 685–690.

“Synthesis and Enzymatic Cleavage of Dual-Ligand Quantum Dots” Sewell, S.L.; Giorgio, T.D. *Materials Science and Engineering C*. **2009**, 29, 1428-1232.

“Piezoelectric Inkjet Printing of Biomimetic Inks for Reactive Surfaces” Deravi, L. F.; Sumerel, J.L; Sewell, S. L.; Wright, D.W. *Small*. **2008**, 4, 2127-2130.

“Versatile Biomimetic Dendrimer Templates for the Formation of TiO<sub>2</sub> and GeO<sub>2</sub>” Sewell, S. L.; Rutledge, R. D.; Wright, D. W. *Dalton Transactions*. **2008**, 29, 3857-3865.

“Proximity-Activated Nanoparticles: *In Vitro* Performance of Specific Structural Modification by Enzymatic Cleavage” Smith, R. A.; Sewell, S.L.; Giorgio, T.D. *International Journal of Nanomedicine*. **2008**, 3, 95-103.

“Detoxification Biominerals” Carney, C. K.; Harry, S. R.; Sewell, S.L.; Wright, D.W. Topics in Current Chemistry, K. Naka, Ed., Springer-Verlag: Amsterdam, **2007**, 270, 155-185.

“Piezoelectric Print of Medical and Biological Materials” Sumerel, J.; Lewis, J.; Naraya, R.J.; Doraiswamy, A.; Dervai, L.F.; Sewell, S.L.; Gerdon, A.E.; Wright, D.W. *BIOspektrum*. **2006**, 12, 756-757.

“Piezoelectric Ink Jet Processing of Materials for Medical and Biological Applications” Sumerel, J.; Lewis, J.; Doraiswamy, A.; Deravi, L. F.; Sewell, S. L.; Gerden, A. E.; Wright, D. W.; Narayan, R. J. *Biotechnology Journal*. **2006**, 1, 976-987.

“The Basis of Immunomodulatory Activity of Malaria Pigment (Hemozoin)” Carney, C. K.; Schrimpe, A. C.; Halfpenny, K.; Harry, S. R.; Miller, C. M.; Broncel, M.; Sewell, S.L.; Schaff, J. E. Deol, R.; Carter, M. D.; Wright, D. W. *Journal of Biological Inorganic Chemistry*. **2006**, 11, 917-929.

“Biomimetic Synthesis of Titanium Dioxide Utilizing the R5 Peptide Derived from *Cylindrotheca fusiformis*” Sewell, S. L.; Wright, D. W. *Chemistry of Materials*. **2006**, 18, 3108-3113.

“Reduction of Secondary Alkyl Bromides by Palladium Catalysts Containing Chelating Diphosphine Ligands” Milczek, E. L.; Palmiero, L.; Sewell, S. L.; Knight, K. S. *Transition Metal Chemistry*. **2006**, 31, 27-29.

“Size Control of Dendrimer-Templated Silica” Knecht, M. R.; Sewell, S. L.; Wright, D. W. *Langmuir*. **2005**, 21, 2058-2061.