Arthur Day Stem

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Summary

Highly motivated scientist with 13 years of laboratory experience, specializing in environmental and occupational toxicology, kidney/liver disease, and cellular energetics.

Strong background in research, including roles in personnel training, undergraduate mentoring, and lab/project management, with expertise demonstrated by 11 peer-reviewed publications and multiple academic awards.

Excellent communication skills, with experience delivering invited talks at University of Colorado undergraduate events, Colorado State University class lectures, and presenting findings at national and international conferences.

Research Experience

Molecular and Systems Toxicology
University of Colorado Anschutz Medical Campus — New Haven, CT
Toxicology PhD Student, School of Pharmacy — 2024 – Present

Postdoctoral fellow in Vasilis Vasiliou's lab, research focuses on pathophysiology of Alcohol-associated Liver Disease (ALD) and hepatotoxic potential of PFAS. Developed PFAS and alcohol co-exposure animal model and currently focused on identifying specific mechanisms of synergistic toxicity.

Primary Techniques: large data analysis, metabolomics, lipidomics, imaging mass spectrometry, lipid peroxidation, mitochondrial function, liver function, animal models, histopathology

Molecular and Systems Toxicology
University of Colorado Anschutz Medical Campus — Aurora, CO
Toxicology PhD Student, School of Pharmacy — 2020 – 2024

Graduate student in Jared Brown's lab, research focused on investigating contributing environmental factors to chronic kidney disease of an unknown etiology and mechanisms of silica nanoparticle toxicity. Developed lab protocols for large omic dataset analysis and optimized redox click chemistry protocol for use in cell culture models.

Primary Techniques: large data analysis, metabolomics, proteomics, western blotting, cellular energetics (seahorse), cytotoxicity, mitochondrial function, particle characterization, ICP-MS, metabolomics, ROS generation, fluorescent microscopy, redox click chemistry,

Traumatic Brain Injury and Coagulopathy
University of Colorado Anschutz Medical Campus — Aurora, CO
Senior Professional Research Assistant, Department of Surgery — 2017 – 2020

Worked with Mitchell Cohen's group, responsible for initial lab setup, management, procurement, and regulatory compliance. Coordinated with national multi-site assay group to analyze thousands of patient samples.

Primary Techniques: protein/cytokine analysis (ELISA), cell culture model development, clotting factor quantification (Stago/), coagulation characterization (TEG), tight junction and cell permeability analysis (TEER)

Plant Genetics
University of Arkansas at Little Rock — Little Rock, AR
Researcher, Biology Department — 2012-2014

Worked with Stephen Grace's lab to determine phenotypical changes resulting from a naturally occurring mutation. Generated data used to support publication of *Metabolomics: Fundamentals and Applications*, credited in acknowledgements as Arthur Colvis.

Primary Techniques: DNA extraction, PCR, gel electrophoresis, LCMS, metabolomics, genetic expression and analysis

Education

Ph.D. in Toxicology 2020 - 2024	**University of Colorado Anschutz Medical Campus – Skaggs School of Pharmacy and Pharmaceutical Sciences** Advisor: Dr. Jared Brown Dissertation: Metabolic Impact of Silica Nanoparticles and Development of Chronic Kidney Disease of Unknown Etiology (CKDu)
B.S. in Biology 2014	**University of Arkansas at Little Rock** Advisor: Dr. Stephen Grace Conducted research on "Light regulated expression of a development gene in tomato" Graduated *magna cum laude*
A.S. in Science 2011	**National Park Community College** Earned a minor two-year degree before transferring with a 4.00 GPA

Publications

Sarigiannis, D., Karakitsios, S., Anesti, O., **Stem, A.**, Valvi, D., Sumner, S. C. J., Chatzi, L., Snyder, M. P., Thompson, D. C., & Vasiliou, V. (2025). Advancing translational exposomics: bridging genome, exposome and personalized medicine. *Human genomics*, 19(1), 48. https://doi.org/10.1186/s40246-025-00761-6

Stem, A. D., Michel, C. R., Harris, P. S., Rogers, K. L., Gibb, M., Roncal-Jimenez, C. A., Reisdorph, R., Johnson, R. J., Roede, J. R., Fritz, K. S., & Brown, J. M. (2025). Modulation of the thiol redox proteome by sugarcane ash-derived silica nanoparticles: insights into chronic kidney disease of unknown etiology. *Particle and fibre toxicology*, 22(1), 3. https://doi.org/10.1186/s12989-025-00619-8

Stem, A. D., Gibb, M., Roncal-Jimenez, C. A., Johnson, R. J., & Brown, J. M. (2024). Health burden of sugarcane burning on agricultural workers and nearby communities. *Inhalation Toxicology,* 0(0), 1–16. https://doi.org/10.1080/08958378.2024.2316875

Stem, A. D., Brindley, S., Rogers, K. L., Salih, A., Roncal-Jimenez, C. A., Johnson, R. J., Newman, L. S., Butler-Dawson, J., Krisher, L., & Brown, J. M. (2024). Exposome and Metabolome Analysis of Sugarcane Workers Reveals Predictors of Kidney Injury. *Kidney International Reports*, 0(0). https://doi.org/10.1016/j.ekir.2024.01.060

Roncal-Jimenez, C. A., Rogers, K. L., **Stem, A**., Wijkstrom, J., Wernerson, A., Fox, J., Garcia Trabanino, R., Brindley, S., Garcia, G., Miyazaki, M., Miyazaki-Anzai, S., Sasai, F., Urra, M., Cara-Fuentes, G., Sánchez-Lozada, L. G., Rodriguez-Iturbe, B., Butler Dawson, J., Madero, M., Brown, J. M., & Johnson, R. J. (2024). Intranasal Administration of Sugarcane Ash Causes Chronic Kidney Disease in Rats. *American Journal of Physiology-Renal Physiology*. https://doi.org/10.1152/ajprenal.00251.2023

Rogers, K. L., Roncal-Jimenez, C. A., Leiva, R., **Stem, A**., Wijkstrom, J., Serpas, L., González-Quiroz, M. A., Sasai, F., Wernerson, A., Schaeffer, J., Fox, J., Ray, M., Bansal, A., Urra, M., Butler-Dawson, J., Lucia, S., Newman, L. S.,

Glaser, J., Johnson, R. J., & Brown, J. M. (2023). Silica Nanoparticles and Mesoamerican Nephropathy: A Case Series. *American Journal of Kidney Diseases*. https://doi.org/10.1053/j.ajkd.2023.06.010

Stem, A. D., Rogers, K. L., Roede, J. R., Roncal-Jimenez, C. A., Johnson, R. J., & Brown, J. M. (2023). Sugarcane ash and sugarcane ash-derived silica nanoparticles alter cellular metabolism in human proximal tubular kidney cells. *Environmental Pollution*, 332, 121951. https://doi.org/10.1016/j.envpol.2023.121951

Stafford, P., Mitra, S., Debot, M., Lutz, P., **Stem, A**., Hadley, J., Hom, P., Schaid, T. R., & Cohen, M. J. (2022). Astrocytes and pericytes attenuate severely injured patient plasma mediated expression of tight junction proteins in endothelial cells. *PLOS ONE*, 17(7), e0270817. https://doi.org/10.1371/journal.pone.0270817

Sasai, F., Rogers, K. L., Orlicky, D. J., **Stem, A.**, Schaeffer, J., Garcia, G., Fox, J., Ray, M. S., Butler-Dawson, J., Gonzalez-Quiroz, M., Leiva, R., Taduri, G., Anutrakululchai, S., Venugopal, V., Madero, M., Glaser, J., Wijkstrom, J., Wernerson, A., Brown, J. M., … Roncal-Jimenez, C. A. (2022). Inhaled silica nanoparticles cause chronic kidney disease in rats. *American Journal of Physiology-Renal Physiology,* 323(1), F48–F58. https://doi.org/10.1152/ajprenal.00021.2022

Stettler, G. R., Moore, E. E., Moore, H. B., Nunns, G. R., Coleman, J. R., **Colvis, A.,** Ghasabyan, A., Cohen, M. J., Silliman, C. C., Banerjee, A., & Sauaia, A. (2019). Variability in international normalized ratio and activated partial thromboplastin time after injury are not explained by coagulation factor deficits. *The Journal of Trauma and Acute Care Surgery*, 87(3), 582–589. https://doi.org/10.1097/TA.0000000000002385

Oral Presentations

October 2023	*Renal Toxicology* Colorado State University Fort Collins, CO
August 2023	*Sugarcane Ash and Sugarcane Ash-Derived Silica Nanoparticles Alter Mitochondrial Function and Metabolic Activity in Proximal Tubular Kidney Cells* Mountain West Society of Toxicology (MWSOT) Aurora, Colorado
August 2023	*Chronic Kidney Disease of An Unknown Etiology (CKDu)* CU Department of Pharmaceutical Sciences Research Retreat Aurora, CO
June 2023	*CKDu and me: Mitochondrial Analysis and the Grad-school Experience* Colorado Undergraduate Research in Environmental Health Sciences (CUREHS) Aurora, CO
May 2023	*Sugarcane Ash and Sugarcane Ash-Derived Silica Nanoparticles Alter Cellular Metabolism in Human Proximal Tubular Kidney Cells* British Occupational Hygiene Society (BOHS) Manchester, UK
April 2023	*Sugarcane Ash and Sugarcane Ash-Derived Silica Nanoparticles Alter Mitochondrial Function and Metabolic Activity in Proximal Tubular Kidney Cells* CU School of Pharmacy Student Spring Symposium Aurora, Colorado

Poster Presentations

April 2024	*Metabolomic and Elemental Analysis of High Risk Sugarcane Workers* CU School of Pharmacy Student Spring Symposium Aurora, Colorado

March 2024	*Exposome and Metabolome Analysis of Sugarcane Workers Reveals Predictors of Kidney Injury* Society of Toxicology (SOT) Salt Lake City, Utah
March 2024	*Sugarcane Ash Alters Metabolome and Induces Kidney Injury In-Vivo* Colorado Consortium on Climate Change and Health (C4Health) Aurora, Colorado
March 2023	*Sugarcane Ash and Sugarcane Ash-Derived Silica Nanoparticles Alter Cellular Metabolism in Human Proximal Tubular Kidney Cells* Society of Toxicology (SOT) Nashville, Tennessee
April 2022	*Sugarcane Ash and Sugarcane Ash-Derived Silica Nanoparticles Alter Mitochondrial Function and Metabolic Activity in Proximal Tubular Kidney Cells* CU School of Pharmacy Student Spring Symposium Aurora, Colorado
March 2022	*Sugarcane Ash and Sugarcane Ash-Derived Silica Nanoparticles Alter Mitochondrial Function and Metabolic Activity in Proximal Tubular Kidney Cells* Society of Toxicology (SOT) San Diego, California
August 2019	*Coagulation Factor Replacement Does Not Explain the Benefits of Plasma-Based Resuscitation after Injury* Military Health System Research Symposium (MHSRS) Orlando, Florida

Awards & Honors

School of Pharmacy (SOP) Harold C. Heim Award for Excellence in Research and Graduate Education 2024

SOT Mechanisms Specialty Section Renal Toxicology Award 2023

SOT Nanoscience and Advanced Materials Specialty Section Outstanding Graduate Student Award 2023

SOT Mechanisms and Risk Assessment Specialty Section Robert J. Rubin Student Travel Award 2023

Mountain West Society of Toxicology (MWSOT) Best Student Presentation 2023

SOP Student Spring Symposium Best Platform Talk 2023

SOP Toxicology Student Representative 2022-2023

SOP Richard Deitrich Graduate Scholarly Award 2021

References

Jared Brown, Ph.D.
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Keegan Rogers, Ph.D.
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