

Brian A. Logue, Ph.D.

South Dakota State University, Department of Chemistry and Biochemistry,
1015 Campanile Ave, Brookings, SD 57007, (605) 691-2674, (605) 688-6698, brian.logue@sdstate.edu
Full Curriculum Vitae available upon request.

PROFESSIONAL OBJECTIVE

Maximize the potential of the individuals, groups, and organizations of which I belong through focused leadership, to include efforts to grow the impact of my research group and to positively affect the students I mentor and instruct.

SUMMARY

- Demonstrated leadership in the U.S. Army and at SDSU.
- Strong background in Analytical Chemistry, Bioanalytical Chemistry, and Environmental Chemistry.
- Core research area has focused on the development of innovative analytical methods, techniques, and instrumentation to determine exposure to chemical warfare agents, especially cyanide.
- Developed a reputation as the world's foremost expert on the analysis of cyanide, its metabolites, and therapeutics of cyanide exposure.
- Experience in a wide variety of analytical procedures, including GC-MS, LC-MS/MS, and HPLC.
- Interests also include sensor development and our discovery of a novel sample preparation technique called ICECLES.
- Entrepreneurial mindset with multiple patents awarded and a business created to commercialize the technology developed.

EDUCATION

- PhD, Analytical Chemistry, Oregon State University, Corvallis (September 1995 – June 2000)
Graduated with Highest Honors, GPA: 4.00
Graduate Thesis: *The Role of Iron-Oxides in U(VI) Adsorption and Kinetics of Contaminant Organic Reduction*
Adviser: Professor John C. Westall
- BS, Chemistry, South Dakota State University, Brookings (September 1991 – May 1995)
Graduated with Highest Honors, GPA: 3.87

EMPLOYMENT HISTORY

- Professor – South Dakota State University, Brookings, SD (2015 – present)
- Associate Professor – South Dakota State University, Brookings, SD (2011 – 2015)
- Assistant Professor – South Dakota State University, Brookings, SD (2010 – 2011)
- Associate Research Professor – South Dakota State University, Brookings, SD (2009 – 2010)
- Assistant Research Professor – South Dakota State University, Brookings, SD (2004 – 2009)
- Primary Investigator – United States Army Medical Research Institute of Chemical Defense, Aberdeen Proving Ground, MD (2002 – 2004)
- Platoon Leader – 7th Chemical Company, Biological Integrated Defense System, United States Army Chemical Corps, Fort Polk, LA (2000 – 2002)

PROFESSORIAL TEACHING EXPERIENCE

- Assistant/Associate/Full Professor – South Dakota State University, Brookings, SD (2004 – present)
Elementary Organic Chemistry (undergraduate; F04-S16) lecture; coordinated and taught the associated laboratory. Advanced Analytical Chemistry (graduate; S06-present) lecture. General Chemistry. Electroanalytical Chemistry (graduate). Bioanalytical Chemistry (undergraduate). Analytical Chemistry I and II, with associated lab (undergraduate). Toxicology (grad/undergrad). Surface Engineering (team taught, grad/undergrad). Chromatography and Separations (team taught, graduate).

PROFESSIONAL ORGANIZATIONS

- American Chemical Society Member (1994 – present)
 - Environmental Chemistry Division Member (1998, 2003-2014)
 - Analytical Chemistry Division Member (2003-present)
- Phi Lambda Upsilon – Chemistry Honor Society (1993 – present)
- Sigma Lambda Sigma Mortar Board – Academic Honor Society (1994 – 1995)
 - Community Service Committee Member

HONORS/AWARDS (ACADEMIC/RESEARCH)

- F.O. Butler Award for Excellence in Research (2020)
- SDSU Excellence in Graduate Student Mentoring Award (2020)
- Gagliardi Distinguished Lecturer – Richard Wagner University (2019)
- SDSU College of Arts and Sciences Outstanding Research in the Natural and Social Sciences Award (2018)
- SDSU Sewry Colloquium Research and Scholarship Lecturer (2014)
- SDSU Graduate Teacher of the Year (2013)
- SDSU College of Arts and Science Distinguished Researcher of the Year (2008)
- Yerex Fellow – Oregon State University (1998 – 1999)
- Associated Western University Fellow (1996 – 1999)
- Graduate Student Award in Environmental Chemistry (1998)
- Benedict Award – Most progress on thesis research for a second year student (1997)
- Ingram Award – Best first year graduate student academically (1996)
- National Defense Science and Engineering Graduate Fellow Honorable Mention (1996)

HONORS/AWARDS (MILITARY)

- Meritorious Service Medal (2004)
- Global War on Terrorism and Global War on Terrorism Expeditionary Medals (2004)
- Army Commendation Medal (+ 1 OLC, 2002)
- Air Assault 20K Road March Champion (2001)
- Army Achievement Medal (2001)
- Distinguished Honor Graduate of the Chemical Officer Basic Course (2000)
- German Armed Forces Efficiency Badge – Gold Level (2000)
- Distinguished Military Graduate (1995)

RESEARCH SUPPORT

- Current (ca. \$1.85 M):
 - “South Dakota Governor’s Center: Understanding and Disrupting the Illicit Economy,” SD BoR, Co-PI, \$889,887. (June 2021-2023).
 - “Analysis of Sulfur Mustard Metabolites for Natural History Assessment of Pulmonary Injury After Sulfur Mustard Inhalation,” BARDA, Co-PI, 250,682. (June 2021-2023).
 - “Collaborative Research: NRT: Cyber-Physical-Social System for Understanding and Thwarting the Illicit Economy,” NSF, PI on Collaborative Grant, \$540,085 (9/1/2018-8/31/2023).
 - “Analysis of DMTS, DMDS, Cyanide and Thiocyanate Following Intramuscular Administration of DMTS as a Cyanide Therapeutic,” DoD/NIH, PI, \$165,318. Dr. Logue will execute 100% of the budget (October 2020-September 2023).
- Recent Past Funding (executed ca. \$8.92 M at SDSU as PI or Co-PI; full list available upon request):
 - “Analysis of Important Dimethyl trisulfide and Cyanide Markers Following Intranasal Administration of DMTS,” DoD/NIH, PI, \$247,148. Dr. Logue will execute 100% of the budget (January 2020-September 2022).
 - “Development of Antidotes for Toxic Gases (co-PI),” NIH, subaward PI, \$754,534 (subaward budget split into two projects). Dr. Logue will execute 100% of the sub-award budget (September 2016-August 2022).
 - “Collaborative Research: REU Site: Security Printing and Anti-counterfeit Technologies,” NSF, PI on Collaborative Grant, \$95,196 of \$519,062 total project. Dr. Logue oversees 17% of the total SPACT REU budget (May 2019-2022).
 - “The analysis of DMTS from rat blood for DMTS drug development as a cyanide antidote (SRI),” Southwest Research Institute, PI, \$43,606. Dr. Logue will execute 100% of the budget (February 2022-May 2022).
 - “Phase II SBIR: PFAS Analyzer- A fieldable device for the broad-spectrum analysis of PFAS in water, soil, and sediments,” EPA, Co-PI with Seacoast Science, \$110,000 (SDSU). (September 2019-2021).

- “The analysis of DMTS from rat and swine blood and tissue for evaluation of DMTS as a cyanide antidote,” Southwest Research Institute, PI, \$87,476. Dr. Logue will execute 100% of the budget (October 2020-May 2021).

RECENT PUBLICATIONS (Total: 81; 21 undergraduate authors; full list available upon request)

- Alluhayb A.H., Severance C.C., Hendry-Hofer T.B., Bebart V.S., and Logue B.A. (2023) Simultaneous Determination of Cyanide and Thiocyanate in Human Antemortem and Postmortem Blood by High-Performance Liquid Chromatography-Tandem Mass Spectrometry. *Analytical and Bioanalytical Chemistry*, **submitted**.
- Armoo A., Diemer T., Donkor A., Fedorchik J.*, Van slambrouk S., Willand-Charnley R. and Logue B.A. (2023) Methimazole, an Effective Neutralizing Agent of the Sulfur Mustard Derivative 2-Chloroethyl Ethyl Sulfide. *ACS Journal of Medicinal Chemistry Au*, **accepted**. (<https://doi.org/10.1021/acsbiochemau.2c00087>).
- Nick H.J., Johnson C.A., Stewart A.R., Christeson S.E., Bloomquist L.A., Appel A.S., Donkor A.B., Veress L.A., Logue B.A., Bratcher P.E., White C.W. (2023) Mesna Improves Outcomes of Sulfur Mustard Inhalation Toxicity in an Acute Rat Model. *Journal of Pharmacology and Experimental Therapeutics*, **accepted**. (<https://doi.org/10.1124/jpet.123.001683>).
- Skaggs C.S., and Logue B.A. (2022) The Prevalence of Opioids in US Drinking Water Sources Detected Using Direct-Injection High-Performance Liquid Chromatography–Tandem Mass Spectrometry. *Environmental Toxicology and Chemistry*, **41**, 2658 (<https://doi.org/10.1002/etc.5453>).
- Donkor A.B., Gyamfi O.A., White C.W., Nick H. J., Rioux J.S., Veress L.A., and Logue B.A. (2022) Identification and determination of phenyl methyl carbamate released from adducted hemoglobin for methyl isocyanate exposure verification. *Journal of Chromatography A*, **1681**, 463454 (<https://doi.org/10.1016/j.chroma.2022.463454>).
- Donkor A.B., White C.W., Nick H.J., and Logue B.A. (2022) Analysis of sodium 2-mercaptoethane sulfonate in rat plasma using high performance liquid chromatography tandem-mass spectrometry. *Journal of Chromatography B*, **1189**, 123088 (<https://doi.org/10.1016/j.jchromb.2021.123088>).
- Bhadra S., Chan A., Hendry-Hofer T.B., Boss G.R., Bebart V.S., and Logue B.A. (2022) Analysis of bisaminotetrazole cobinamide, a next-generation antidote for cyanide, hydrogen sulfide and methanethiol poisoning, in swine plasma by liquid chromatography-tandem mass spectrometry. *Journal of Chromatography B*, **1208**, 123392 (<https://doi.org/10.1016/j.jchromb.2022.123392>).
- Lee J.W., Wang S., Seefeldt T., Donkor A., Logue B.A., Kim H.S., Hong J., and Woyengo T.A. (2022) Porcine in vitro fermentation characteristics of canola co-products in neutral and acidic fermentation medium pH. *Animal Feed Science and Technology*, **284**, 115188 (<https://doi.org/j.anifedsci.2021.115188>).
- Hendry-Hofer T.B., Severance C.C., Bhadra S., Ng P.C., Soules K., Lippner D.S., Hildenberger D.M., Rhoomes M.O., Winborn J.N., Logue B.A., Rockwood G.A., and Bebart V.S. (2022) Evaluation of aqueous dimethyl trisulfide as an antidote to a highly lethal cyanide poisoning in a large swine model. *Clinical Toxicology*, **60**, 95 (<https://doi.org/10.1080/15563650.2021.1935992>).
- Chan A., Lee J., Bhadra S., Bortey-Sam N., Hendry-Hofer T.B., Bebart V.S., Mahon S.B., Brenner M., Logue B.A., Pilz R.B., and Boss G.R. (2021) Development of sodium tetrathionate as a cyanide and methanethiol antidote. *Clinical Toxicology*, **60**, 332 (<https://doi.org/10.1080/15563650.2021.1953517>).
- Skaggs C.S., and Logue B.A. (2021) Ultratrace analysis of per- and polyfluoroalkyl substances in drinking water using Ice Concentration Linked with Extractive Stirrer (ICECLES) and HPLC-MS/MS. *Journal of Chromatography A*, **1659**, 462493 (<https://doi.org/10.1016/j.chroma.2021.462493>).
- Reza K.M., Gurung A., Bahrami B., Chowdhury A.H., Ghimire N., Pathak R., Rahman S.I., Laskar M.A.R., Chen K., Bobba R.S., Lamsal B.S., Biswas L.K., Zhou Y., Logue B.A., and Qiao Q. (2021) Grain Boundary Defect Passivation in Quadruple Cation Wide-Bandgap Perovskite Solar Cells. *Solar*, **5**, 2000740 (<https://doi.org/10.1002/solr.202000740>).
- Bhadra S., Bebart V.S., Hendry-Hofer T.B., Lippner D.S., Winborn J.N., Rockwood G.A., and Logue B.A. (2020) Analysis of the Soil Fumigant, Dimethyl Disulfide, in Swine Blood by Dynamic Headspace Gas

Chromatography–Mass Spectroscopy. *Journal of Chromatography A*, **1638**, 461856 (<https://doi.org/10.1016/j.chroma.2020.461856>).

- Skaggs C.S., Alluhayb A.H., and Logue B.A. (2020) Comparison of the Extraction Efficiency of Ice Concentration Linked with Extractive Stirrer, Stir Bar Sorptive Extraction, and Solid-Phase Microextraction for Pesticides from Drinking Water. *Journal of Chromatography A*, **1622**, 461102 (<https://doi.org/10.1016/j.chroma.2020.461102>).
- Skaggs C.S., and Logue B.A. (2020) Ultratrace analysis of atrazine in soil using Ice Concentration Linked with Extractive Stirrer (ICECLES) and HPLC-MS/MS. *Journal of Chromatography A*, **1635**, 461753 (<https://doi.org/10.1016/j.chroma.2020.461753>).
- Lee J.W., Wang S., Huang Y., Seefeldt T., Donkor A., Logue B.A., and Woyengo T.A. (2020) Toxicity of canola-derived glucosinolates in pigs fed resistant starch-based diets. *Journal of Animal Science*, **98(5)**, skaa111 (<https://doi.org/10.1093/jas/skaa111>).
- Logue B.A., Skaggs C., and Alluhayb A.H. (2020) Sample Preparation Goes Subzero: Ice Concentration Linked with Extractive Stirrer (ICECLES). *LC/GC*, **38(1)**, 16-22 (<http://www.chromatographyonline.com/sample-preparation-goes-subzero-ice-concentration-linked-extractive-stirrer-icecles>). Top 10 most read LC/GC articles of 2020.
- Bortey-Sam N., Jackson R., Gyamfi O.A., Bhadra S., Freeman C.*, Mahon S.B., Brenner M., Rockwood G.A., and Logue B.A. (2020) Diagnosis of cyanide poisoning using an automated, field-portable sensor for rapid analysis of blood cyanide concentrations. *Analytica Chimica Acta*, **1098**, 125-132. (<https://doi.org/10.1016/j.aca.2019.11.034>).

PATENTS/DISCLOSURES (Full listing: 4 full patents; 10 disclosures/provisional patents)

- White C.W., Nick H., Bratcher P., and Logue B.A. (2022) Methods of Treating a Subject Exposed to a Toxic Inhaled Chemical with MESNA, International Patent Application No. WO 2022/177897 (August 25, 2022).
- Logue B.A. and Deimer T. (2019). Scavenging drug molecules for sulfur mustard. Disclosure filed.
- Shore J., Logue B.A., Burch K. (2019) Electromagnetic stirrer thermoelectric cooler for ICECLES analysis. Disclosure filed.
- Logue B.A., Jackson R. (2018) Rapid Chemical Testing Assembly and Methods Thereof, U.S. Patent Application No. 16/728,303 (December 27, 2019).
- Logue B.A., Hinker P., Ochieng F. (2017) Fast Isotope Ratio Mass Spectrometry. Disclosure filed, patent to be pursued.
- Logue B.A., Baroughi M., Mallam V. (2016) Self-Assembled Organic Monolayer Hybrid Materials and Methods Thereof, US patent 9,478,361 B2 issued on October 25, 2016. Provisional Patent Serial Nos. 61/873,458 (September 4, 2013) and 61/891,451 (October 16, 2013).
- Logue B.A. (2015) Methods and Apparatuses for Trace and Ultratrace Analysis (i.e., the Ice Concentration Linked with Extractive Stirrer (ICECLES) patent), US Patent Document Number P11452US00 (October 30, 2015). European and Japanese patents pursued (October 31, 2016).
- Logue B.A. (2013) Anti-counterfeit printing for pharmaceuticals. Disclosure filed; patent not pursued.
- Logue B.A., C. Vinnakota, K. Vanderweff, P. Baschenbach (2010) Fluorometric cyanide diagnostic. Disclosure filed; patent not pursued.
- Logue B.A. and Baskin S.I. (2004) Analysis of 2-aminothiazoline-4-carboxylic acid. Provisional Patent filed; full patent not pursued.

DISSERTATION/THESIS PUBLICATIONS (Full listing available: 22 total; 16 PhD; 6 MS)

EXPERT PANELS, ETC. (Full listing)

- 2017 NIH Cyanide Blue Ribbon Panel Symposium. Invited Panel Member and Speaker: Clinical/Field Cyanide Detection. Revere Hotel, Boston, MA, June 14, 2017. An international panel of experts to address the issues

involved in cyanide toxicity, exposure, treatment, and detection. The panel addressed the state of the art and future research thrusts for NIH.

- 2010 Expert Panel Workshop on Cyanide. Invited Panel Member. National Institutes of Health, June 24, 2010. An international panel of experts addressing the issues involved in cyanide toxicity, exposure, treatment, and detection. The panel addressed the state of the art and future research thrusts for NIH.
- Bioanalysis of Cyanide Exposure. Invited expert speaker. National Oceanographic and Atmospheric Association International Cyanide Detection Workshop, Orlando, FL, USA, February 6-February 8, 2008. An international (USA, Vietnam, Indonesia, Philippines) working group to address the issue of cyanide fishing and analytical tests to detect and verify cyanide caught fish.

PRESENTATIONS AT SCIENTIFIC MEETINGS: 225 total