

Southern Connecticut State University
501 Crescent Street
Academic Science Building 340B
New Haven, CT 06515

chemkearns.com

TEACHING EXPERIENCE

- August 2019 - Present **Associate Professor of Chemistry; Southern Connecticut State University, New Haven, CT** Instruction of general chemistry, and instrumental analysis to graduate and undergraduate students in health sciences, science education, natural sciences, and chemistry programs; mentoring of undergraduate research initiatives.
- Sept 2013- August 2019 **Assistant Professor of Chemistry; Southern Connecticut State University, New Haven, CT**
- Sept 2011- Dec 2012 **Visiting Professor of Chemistry; St. Thomas Aquinas College, Sparkill, NY**
Taught general chemistry, quantitative analysis and instrumental analysis, engaged students in undergraduate research, advised the science club.
- Aug 2010 – July 2011 **Contract Chemistry Professor; Keene State College, NH, Chemistry Department**
Instructed general chemistry, biochemistry and instrumental analysis to students from a wide range of science and humanities disciplines. Incorporated inquiry-based teaching methods to engage students having a variety of learning styles, advised the science club.
- Spring 2010 **Adjunct Professor of Biochemistry; Westfield State University, MA**
Biochemistry 313 – Biochemistry and Molecular Biology of the Cell
Lectured at the undergraduate and post-graduate levels in preparation for medical school, graduate school (microbiology and biochemistry), forensic science, and physician's assistant schools.
- Sept 1998 – May 2009 **Laboratory Instructor, Lecture Grader, Teaching Assistant Smith College; Northampton MA**
Instructed undergraduate students in the areas of Organic, Analytical, and General Chemistry.
- Jun 2005 – Aug 2009 **Summer Program for Undergraduate Research SPUR; UMass and Lincoln University**
Worked directly mentoring students from Lincoln University, an historically black university, in the areas of analytical chemistry and environmental research for two annual eight-week summer programs.

FELLOWSHIPS

- Fall 2009 **RISE Research Fellowship; Indo-US Science and Technology Forum (IUSSTF); Kolkata, India**
Dr. Ashok K. Giri, Indian Institute of Chemical Biology (IICB), Department of Molecular and Human Genetics
Studied the presence of single nucleotide with PCR and DNA sequencing to create biomarkers for the prediction of cancer. Investigated methylation and its role in gene regulation and transcription.
- Dr. Dipali, Kundu Central Ceramics and Glass Research Institute (CGCRI), Department of Analytical Chemistry**
By ICP-OES, measured the performance of large-scale water filtration systems and made recommendations for the improvement in pretreatment systems located in rural West Bengal, India.
- Jun 2004 – Jun 2006 **National Science Foundation Graduate STEM (Science, Technology, Engineering and Mathematics) Teaching Fellowship; Collaboration between University of Massachusetts and Public Schools**
Created and delivered lessons and a curriculum for the instruction of bird biology and arsenic determination to 250 students in under-resourced inner-city schools of Springfield and Chicopee, Massachusetts.

EDUCATION

Ph.D. in Analytical Chemistry

University of Massachusetts at Amherst; graduated September, 2010

Masters of Science, Analytical Chemistry

University of Massachusetts at Amherst; graduated December, 2004

Bachelor of Science, Biochemistry and Molecular Biology/ Minor Chemistry

University of Massachusetts at Amherst; graduated May, 1997

PUBLICATIONS

Kearns, J.K.; van der Wielen, M. An Undergraduate Instrumental Analysis Laboratory Using AAS to Develop an Optimized Method for Determining Arsenic in Rice *J. Chem. Educ.* 2021, 98, 10, 3297–3302.

Kearns, J.K.; Edson, C. B. Expanding Quantification of Arsenic in Water to 0 $\mu\text{g L}^{-1}$ with a Field Test Kit: Substituting 0.4% m/v Silver Nitrate as the Colorimetric Reagent; Employing Digital Image Analysis. *Water Air Soil Pollut*, 2018, 229, 75, 1–7

Weiss, L., Kearns, J. K., Caffeine and theobromine analysis of *Paullinia yoco*, a vine harvested by indigenous peoples of the upper Amazon. *Bull Yale TRI*, 2015, 34, 6–15.

Kearns, J.; Tyson, J. Improving the accuracy and precision of an arsenic field test kit: increased reaction time and digital image analysis. *Anal. Methods*, 2012, 4, 1693–1698.

Banerjee N.; Nandy S.; Kearns J. K.; Bandyopadhyay A. K.; Das J.K.; Majumder P.; Basu S.; Banerjee S.; Sau T. J.; States C. J.; Giri A. K. Polymorphisms in the TNF- α and IL10-gene promoters and risk of arsenic-induced skin lesions and other non-dermatological health effects. *Toxicol. Sci.* 2011, 121, 132–139.

Bianconi, P. A.; Joray S. J.; Aldrich B.L.; Sumranjit J.; Duffy D.J.; Long D.P.; Lazorcik J.L.; Raboin L.; Kearns J.K.; Smulligan S.L.; Babyak J.M. Diamond and diamond-like carbon from a preceramic polymer. *J. Am. Chem. Soc.* 2004, 126, 3191–3202.

GRANT ACTIVITIES

USAID Research Grant Application. This proposal supports partnerships between a U.S. based engineering company, Elateq the University of San Francisco in Quito (USFQ), and Southern Connecticut State University (SCSU). This project will focus on the evaluation of the performance of an electrochemical reactor. A principal goal is to assess the reactor's efficiency in the removal of metals from waste waters. The evaluation process will be followed by installation of electrochemical reactors in under-resourced communities in rural Ecuador. Application to be submitted in February 2022.

VLIR-UOS Research Grant Application. This proposal supports partnerships between a U.S. based engineering company, Elateq the University of San Francisco in Quito (USFQ), Southern Connecticut State University (SCSU) and university colleges in Belgium. This project will focus on the evaluation of the performance of an electrochemical reactor. A principal goal is to assess the reactor's efficiency in the removal of metals from waste waters. The evaluation process will be followed by installation of electrochemical reactors in under-resourced communities in rural Ecuador. Application to be submitted in February 2022.

CSU-AAUP – 2020 - 2021 - Research Grant entitled a Liquid Chromatography Mass Spectrometry be used to identify new natural products/antibiotic molecules for the treatment of *Borrelia Burgdorferi* (the Lyme Infection)? Awarded January 2021

Todd Ryder, Candy Hwang & James Kearns, Chemistry, “Incorporation of High-Performance Liquid Chromatography into the Chemistry Curriculum” ECIC Bioscience Instrumentation Fund, Awarded Spring 2019

NSF MRI HPLC Grant 2018 for the purchase of a liquid chromatography-tandem mass spectrometry (LC-MS^d). This was written in collaboration with the Central Connecticut State University Chemistry program. The title of: Determination and Quantification of Phycotoxins in Industrialized areas of Long Island Sound by liquid chromatography-tandem mass spectrometry (LC-MS^d) and comparison to metal concentration. This grant was recommended for funding at the amount of \$350,000 in collaboration with the state of Connecticut.

CSU-AAUP – 2017/2018/2019 - Research Grant (a continuation of previous work) entitled Does Heavy Metal Contamination Affect Agave Fluid Products and Create Potential Health Problems? The 2017 grant proposal was recommended for funding by the committee in the amount of \$2500.

JAMES K. KEARNS

Undergraduate Research Grant for the summer of 2018 awarded to Douglas C. The title of this research project is the Bioaccumulation of trace metals in Agave Americana derived Agave Sweetener. The grant was awarded on April, 6th 2018. This grant was recommended for funding by the committee at the amount of \$3,000.

Innocentive Arsenic Sensor Challenge – Submitted March 13, 2017 – This challenge sought to identify new or improved sensor devices or test kits to test for arsenic in water within natural and engineered systems. The grant was sponsored by the U.S. Environmental Protection Agency, Xylem Inc., the Indian Health Service, the National Institute of Standards, the U.S. Agency for International Development, the Agricultural Research Service, and the U.S. Geological Survey. The award for this grant was \$50,000 USD and was declined.

MRI Grant for HPLC and Preparative HPLC 2015 - 2017 – This was an NSF initiative under the major research implementation grant to acquire a high-pressure liquid chromatography for drug characterization and undergraduate instruction. The grant was submitted in January of 2015 and January of 2016 and declined.

CSU-AAUP – 2016-2017 - Research Grant entitled Does Heavy Metal Contamination Affect Agave Fluid Products and Create Potential Health Problems? The 2017 grant proposal was recommended for funding by the committee in the amount of \$3712.50.

CSU-AAUP – 2016 - Research Grant entitled “The Determination of Arsenic in Rice and Apple Products by Acid Digestion and Atomic Absorption Spectroscopy for the Purpose of Developing an Undergraduate Laboratory Experiment”
This grant proposal was recommended for funding by the committee in the amount of \$1350.00.

CSU-AAUP - 2015 Research Grant entitled “Using the Gutzeit Method for the determination of arsenic using silver nitrate as a reagent.”
Internal grant application through the AAUP for \$3750.00 was successful.

SSI (Science Education for New Civic Engagements and Responsibilities Summer Institute) 2014 Post-Institute Implementation Grant Proposal was awarded to the Southern Connecticut State University SSI 2014 Team - Winnie Yu (CSC), Nick Edgington (BIO), James Kearns (CHE), Clara Kim (BIO). It focused on a new method designed to reduce the attrition of STEM discipline students. The proposal was given \$3000.00 for the duration of two years.

Preparation of NSF grant: In collaboration with Dr. Michele Thompson in the SCSU History department prepared an NSF grant which focused on bringing undergraduates to Viet Nam to study culture, history and the chemistry of the Saola's (Asian Unicorn) habitat. (This grant is planned for future submission.)

PROFESSIONAL ACTIVITIES

June 2022 Reviewed an article titled: "Optimizing Methods for ICP-MS Analysis of Mercury in Fish: An Upper-division Analytical Chemistry Laboratory Class" for *Journal of Chemical Education*.

May 2021 accepted the position of chairperson for the SCSU Institutional Biosafety Committee. This committee reviews biochemical protocols submitted by faculty for teaching and research.

March 19th, 2022, gave a talk at the Regional Gathering for Connecticut and Western Massachusetts, Mensa “A Chemists Journey to the Amazon”

March 2021 Reviewed an article titled: "Conversion of PP, HDPE and LDPE Plastics into Liquid Fuels and Chemical Precursors by Thermal Cracking" for *Journal of Polymers and the Environment*.

March 2021 accepted a position on the SCSU Institutional Biosafety Committee. This committee reviews biochemical protocols submitted by faculty for teaching and research.

March 2021 participated in a talk given by Alexion pharmaceutical company, the speakers were Dr. Krista Johnson (director of exploratory and translational research) and Dr. Justin Burt (director of synthetic process development).

October 2019 Participated (and acted as one of two academic advisors) in the induction ceremony for Gamma Sigma Epsilon (Tau Theta chapter) the first honors society at Southern Connecticut State University. The induction ceremony was organized by Dr. Anne Faulk of Worcester State University in Massachusetts.

March of 2019 First place student choice SCSU International Photo Competition.

JAMES K. KEARNS

November of 2018 Chaired a Research and Scholarship Advisory Committee sub-committee for the selection of recipients for the Undergraduate Research Assistantship program for the Spring semester of 2019. This position was renewed by Provost Prezant through May, 2021.

November 2018 Filmed an interview about the Social Justice and outreach projects that involved Brokk Tollefson's journey to the Secoya Community in eastern Ecuador. The film was organized by Alison O'Leary and Cesar Martinez of the Integrated Communications and Marketing department at SCSU.

October 2018 Collaborating in organizing the Csaba Horvath Memorial Award Symposium, Yale, October, sponsored by The Connecticut Separation Science Council, Connecticut Mass Spectrometry Discussion Group and Hungarian Society for Separation Sciences. The symposium includes both poster and oral presentations.

Plant Health Protection Fellowship, U.S.D.A. Victoria R. was trained in the area of atomic spectroscopy and method development with a concentration on plant chemistry. The project focused on determination of copper, iron and zinc in *Agave Americana* and the optimization of extraction methods to improve the measurement of metals in this complex matrix. This project started June 12 and completed on August 9, 2018.

City of New Haven summer camp activity event at SCSU, demonstrating hands-on chemistry experiments to 50 Middle School aged campers, July 2018.

Discovery Day held at the Academic Science and Laboratory Building, 8 members of the Chemistry Club, Todd Ryder and I gave tours of the chemistry facilities and explained the teaching, research and job opportunities for chemistry majors at SCSU. April 15, 2018, Sunday, 2-5 pm

OWL for a Day, the SCSU Chemistry Club provided chemical demonstration for fifty students from Conte West Elementary School, the program to encourage disadvantaged students to follow a path to college. The chemical demonstrations were held on April 6th 2018.

Tech Transfer Basics training with Greg Gallo PhD held on April 6th 2018. This training provided information about the application method for U.S. Federal Patents and funding from CT Next, a funding source.

Training on a Biotage Flash Chromatography System March 2018.

SCSU STEM Festival and the Odyssey of the Mind: The Chemistry Club organized chemical demonstrations for this event. March, 2018.

Re-elected Vice- President of the Connecticut Separation Science Council, Spring, 2018

Professional Research Talk at the 2018 Faculty Research Conference, Hosted by Eastern Connecticut State University "Expanding Quantification of Arsenic in Water to $0 \mu\text{g L}^{-1}$ with a Field Test Kit: Substituting 0.4% m/v Silver Nitrate as the Colorimetric Reagent; Employing Digital Image Analysis," March, 2018.

Re-elected Vice- President of the Connecticut Separation Science Council, Summer, 2017.

U.S. Provisional Patent Application Filed and granted for arsenic sensor test kit: serial No. 62/443,339 | WHE Ref.: CONNSCU-08, January 2017.

Submitted an NSF MRI HPLC Grant 2017 for the purchase of a combined preparative and analytical grade HPLC.

Collaborated in organizing the Csaba Horvath Memorial Award Symposium, Yale, October, 2016 sponsored by The Connecticut Separation Science Council, Connecticut Mass Spectrometry Discussion Group and Hungarian Society for Separation Sciences. The symposium included both poster and oral presentations.

Elected Vice- President of the Connecticut Separation Science Council, Summer 2016. Organized October, 2016 CSSC Conference.

Awarded the Joan Finn Faculty Research Fellowship for the fall of 2016. The research proposal focused on the development of new, relevant, engaging undergraduate lab experiments for the measurement of metals in food products.

JAMES K. KEARNS

In the spring of 2016 negotiated a research agreement with Dr. Daniela Streitwieser, chair of the chemical engineering department of the University of San Francisco De Quito, Ecuador, between her university and SCSU. The focus of the project is the evaluation of natural metal contamination in agricultural products.

Awarded CSU-AAUP grant titled "The determination of arsenic in rice and other food sources by chemical digestion and measurement with an atomic absorption spectrophotometer for use as a laboratory experiment for upper level undergraduate chemistry students." The grant was awarded in 2016.

Organized (member of the steering committee) the first American Chemical Society poster session at SCSU, which was held in during the spring semester in 2016. Competing with participants from Yale, Fairfield, UNH, and SCSU, the two students working with me took first and second place.

Collaborated in organizing the Csaba Horvath Memorial Award Symposium October, 2016, Yale, sponsored by The Connecticut Separation Science Council, Connecticut Mass Spectrometry Discussion Group and Hungarian Society for Separation Sciences. The symposium included both poster and oral presentations.

Adviser to the Southern Connecticut State University's American Chemical Society Chemistry Club from 2014 - Present.

Participated in the 2016 SCSU Undergraduate Research Symposium with two research students.

Spring, 2015, presented to the PAcE seminar at SCSU on a method using HPLC to measure caffeine and theobromine concentrations in *Paulina Yoko* a plant native to the Western Amazon.

Mentored Kayla O. in the determination of lead in soils around houses in New Haven using a colorimetric method employing a photometer and UV-Vis spectrophotometry. Harrison S. engaged in a project measuring phosphate in wastewater using a colorimetric field portable method in combination with UV-Vis spectrophotometry. Marc M. measured commercial and lab created extracts in Liquid Chromatography Mass Spectrometry to identify bioactive components of the plant cat's claw (*Uncaria tomentosa*).

Assisted in the graduate application process for chemistry PhD for Kayla O. She was admitted and will attend the University of Delaware's PhD program in Chemistry with a focus on toxicology and environmental studies in the fall of 2021.

Advised and recommended Harrison S. to apply for employment at York Analytical Labs Inc in Stratford, CT, He interviewed and started his job in March of 2021.

Supervised and assisted two undergraduate students in research projects. The one student collaborated in the development of new methods for measuring arsenic in drinking water by combining field portable methods with digital image analysis. The other measured cadmium in sediment samples in Long Island Sound harbor regions. Vincent Breslin, PhD, Co-Chair of the Environmental Studies Department of SCSU, managed these projects. This collaboration took place between June of 2015 and May of 2016.

Collaboration with Luke Weiss, graduate student of Gaboury Benoit, PhD, Professor of Environmental Chemistry at Yale University's School of Forestry and Environmental Studies to develop a method using HPLC of measuring caffeine and theobromine concentrations in *Paulina Yoko* a plant native to the Western Amazon. This project took place between September of 2013 and May of 2015.

Assisted and supervised two undergraduate students in research projects measuring Mercury and Arsenic in sediment samples in Long Island Sound harbor regions in Southern Connecticut with Vincent Breslin, PhD, Chair of the Environmental Studies Department of SCSU. These two projects were executed between June of 2014 and May of 2015.

Chairman of the Search Committee for an Assistant Professor with Polymer Science concentration for the Chemistry Department, Southern Connecticut State University: October 2014 – May 2015

Revised the Chemistry Major, adding a specialization in Environmental and Marine Studies, integrating courses from the Environmental and Marine Studies program into the Chemistry major to develop a program qualifying students for employment in the

Connecticut coastal region's environmental programs and industries. This new program was accepted by the Undergraduate Curriculum Forum, at an autonomous standing committee of the Faculty Senate in 2015.

Organized a National Chemistry Week competitive poster session for middle school students in the New Haven County, sponsored by the American Chemical Society. Fall 2015.

PRESENTATIONS

Joshua G. (research student) presented at the 3rd annual Student Research Symposium hosted by Quinnipiac University Department of Chemistry and Physical Sciences and the American Chemical Society New Haven Local Section. His presentation was on “Assessment of acid digestion protocols for estuarine sediment to optimize trace element recovery to optimize trace element recovery using ICP OES Analyses”. April 28th 2018

Joshua G. (research student) presented at the 4th annual SCSU Undergraduate Creative Activity Conference. His presentation was on “Assessment of acid digestion protocols for estuarine sediment to optimize trace element recovery to optimize trace element recovery using ICP OES Analyses”. April 15th 2018

Joshua G. (research student) presented at the New England Water Innovation Conference held at Worcester Polytechnic Institute. His presentation was on “Assessment of acid digestion protocols for estuarine sediment to optimize trace element recovery to optimize trace element recovery using ICP OES Analyses”. September 18th 2017

Qiana M. (Dr. Vincent Breslin’s research student) presented with my assistance a poster in the 2017 Worcester Polytechnic Institute Water Leadership Conference “An examination of the tissues of American Oysters for the presence of plastic microbead in the Housatonic River Estuary.”

Cody E. (research student) presentation at the New England Water Innovation Conference held at Worcester Polytechnic Institute. His presentation was on “The determination of arsenic (III) in the concentration range of 0 to 50 $\mu\text{g L}^{-1}$ with a field test kit utilizing silver nitrate as a reagent”. He tied for second place recognition in competition with PhD students from Dartmouth, WPI, and Northeastern. On October 24th 2016

Lela J. (Dr. Breslin’s research student) presented with my assistance at the New England Water Innovation Conference held at Worcester Polytechnic Institute. Her presentation was on “An examination of the tissues of American Oysters for the presence of plastic microbead in the Housatonic River Estuary.” She won first place recognition in competition with PhD students from Dartmouth, WPI, and Northeastern. Under recommendation of the dean of the school of Biochemistry Lela applied to the PhD program and was admitted for the fall of 2017. This event was held on October 24th 2016.

Cody E. (research student) presented in the American Chemical Society’s New Haven Chapter 2016 Undergraduate Research Symposium the title of his poster was “The determination of arsenic (III) in the concentration range of 0 to 50 $\mu\text{g L}^{-1}$ with a field test kit utilizing silver nitrate as a reagent” Cody received second place and won a \$200.00 prize. On April 30th 2016.

Sadia Y. (research student) presented in the American Chemical Society’s New Haven Chapter 2016 Undergraduate Research Symposium the title of her poster was “A comparison of cadmium concentration along the long island sound.” Sadia received second place and won a \$100.00 prize.

Cody E. (research student) presented a poster in the 2016 SCSU Undergraduate Research Symposium the title of his poster was “The determination of arsenic (III) in the concentration range of 0 to 50 $\mu\text{g L}^{-1}$ with a field test kit utilizing silver nitrate as a reagent”

Sadia Y. (research student) presented a poster at the 2016 SCSU Undergraduate Research Symposium the title of her poster was “A comparison of cadmium concentration along the Long Island sound.”

Northeast Regional Meeting of the American Chemical Society, 2013, “Method for the determination of arsenic using silver nitrate as a reagent for the Gutzeit Method.”

Southern Connecticut State University: Ground breaking celebration for the University’s new science building September 2013: presented “Method for the determination of arsenic using silver nitrate as a reagent for the Gutzeit Method.”

Pittcon Talk Presentation 2010: “The Determination of Arsenic in Soils by Field Portable Methods.”

Pittcon Poster Presentation 2010: “Investigation of Molybdenum Blue Reagent Formulations for the Determination of Arsenic and Phosphorus and The Determination of Arsenic.”

Pittcon Poster Presentation 2009: “Investigation of Molybdenum Blue Reagent Formulations for the Determination of Arsenic and Phosphorus and The Determination of Arsenic by Gutzeit Method Using Silver Nitrate as a Reactant.”

Pittcon Poster Presentation 2008: “The Determination of Arsenic by Flow Injection.”

FURTHER EDUCATION

Advion Corporation 3 day LCMS training March 2019, Ithaca NY

Training on a Biotage Flash Chromatography System March 2018.

Shimadzu Corporation LCMS training with application specialist Michael Parks – January, 2015

Pittcon Short Course, 2013: Course # 118 Introduction to LCMS; Instructors: Bob Classon & Ross Willoughby

PROFESSIONAL EXPERIENCE

- Jan 2008 – Dec 2008 **Laboratory Manager for The Environmental Institute (TEI); UMass Amherst**
Carried out fundamental water quality analysis, and the communication of those results to local clients and the Department of Environmental Protection.
- Aug 1998 – Aug 2000 **Analytical Chemist: Spectrum Analytical; Agawam MA**
Used GC-MS and ICP-OES to report compliances as established by EPA methods, to analyze soil, water and air.
- Jan 1997 – Jun 1998 **Engineering Consultant: New England Waste Systems; Northampton MA**
Maintained and chemically analyzed large-scale bioremediation systems for the filtration all of the tertiary effluent for the town of Marlboro, MA and the landfill in Randolph, VT