

Konstantinos Kavallieratos

Associate Professor, Department of Chemistry & Biochemistry

FIU Director of the NSF-REU Program on Sensing, Monitoring, and Detection

FIU Director of the NRC Nuclear Scholarships and Fellowships Programs

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Education and Training

1989-93 University of Athens, Greece	“Ptychion”	09/93	Chemistry
1994-95 Yale University, CT	M.S.	05/95	Chemistry
1995-98 Yale University, CT	Ph.D.	05/98	Inorganic Chemistry
1998-2000 Oak Ridge National Laboratory	(Postdoc)	07/00	Separation Chemistry

Past Positions and Employment

7/1998 – 8/2000	Postdoctoral Research Associate, Chemical Separations Group, Chemical and Analytical Sciences Division, Oak Ridge National Laboratory. Research Advisor: Dr. Bruce A. Moyer Basic research in anion and cation recognition focused on the design of selective extractants for radioactive waste treatment.
8/2000 – 8/2006	Assistant Professor, Department of Chemistry and Biochemistry, FIU
8/2006 – Current	Associate Professor, Department of Chemistry and Biochemistry, FIU

Other positions

7/2012-present	FIU Site Director, NSF-REU Undergraduate Research Program
8/2013-present	Director, FIU-NRC Nuclear Research Scholarships Program
8/2014-present	Director, FIU-NRC Nuclear Graduate Student Fellowships Program
1/2015-present	Founding Faculty Fellow: STEM Transformation Institute
2013- present	Chemistry REU National Leadership Group: <i>The National Science Foundation</i>
2011- present	Member, Editorial Advisory Board: <i>Open Spectroscopy Journal</i>
1/2009-7/2009	Visiting Research Fellow, Georgia Institute of Technology, Atlanta, GA Center of Optoelectronic and Photonic Materials (COPE)

Honors and Awards

Association of Greek Chemists Student Award (1989)
Chemistry Student Fellow, Greek council of education (1989-1993)
Florida International University Excellence in Research Award (2006)
FIU Howard Hughes Medical institute (HHMI) Faculty Scholar (2011)
Inductee, National Academy of Inventors-FIU Chapter (2012)

Research and Professional Experience

Dr. Kavallieratos has an active research program in the area of organometallic, supramolecular and nuclear separations chemistry focusing on extraction-based separation/sensing methods for toxic metals, such as Pb, Cd, and Hg, explosives and biomedically and environmentally important ion pairs, including radionuclides. Other projects include: selective sensors for toxic metals and other ionic targets, organometallic fluorescent dyes for Nitric Oxide detection, (US Patent issued to FIU, Dec. 2014), metal cages for delivery of pharmaceuticals in biological systems, and triplet sensitizers for solar cells. He is supporting the creation of radiochemistry courses funded by NRC. He is serving as director of the *FIU Nuclear Scholarships and Fellowships Programs*, currently funded by two separate NRC grants, and is also directing the NSF-REU Site: “*Sensing Monitoring and Detection from Molecules to Applications*” establishing for the first time such a site at the FIU College of Arts and Sciences, funded through a 3-year NSF grant. His undergraduate training record (>35 since 2005) includes 8 MBRS-RISE, 3 McNair, and 3 FGLSAMP scholars, most of whom have presented in national/regional meetings, and several of whom have published. He has been a Student Affiliate Chapter co-advisor for 10 years, and he has served as Chair of the South Florida Section of ACS. He has graduated 4 students with M.S. degrees in the last 5 years

(including 2 African-American women). He currently has two Ph.D. students, one M.S student, and six undergraduate students. Most of his trainees are women (>70%) and minority (>60%).

Selected peer-reviewed publications (826 citations, excluding self-citations, SCI h-index 13)

1. K. Kavallieratos, R. A. Sachleben, G. J. Van Berkel, B. A. Moyer, Novel dual-host approach in ion-pair extraction. A simple tripodal anion host facilitates CsNO₃ transfer to 1,2-dichloroethane by a large crown ether. *Chem. Commun.* **2000**, 187-188.
2. K. Kavallieratos, A. M. Danby, G. J. Van Berkel, M. A. Kelly, R. A. Sachleben, B. A. Moyer, K. Bowman-James; Triamide derivatives of tris(2-aminoethyl)amine (tren) as CsNO₃ co extractants. *Anal. Chem.* **2000**, *72*, 5258-5264.
3. K. Kavallieratos, B. A. Moyer ; Spectacular Cs extraction by the use of a potent dual-host combination. *Chem. Commun.* **2001**, 1620-1621.
4. K. Kavallieratos, J. M. Rosenberg, W.-Z. Chen, T. Ren. Fluorescent sensing and extraction of Pb(II) by a dansylamide ion exchanger. *J. Am. Chem. Soc.* **2005**, *127*, 6514-6515.
5. R. J. Alvarado, J. M. Rosenberg, A. Andreu, J. C. Bryan, W.-Z. Chen, T. Ren, K. Kavallieratos, Structural Insight into the extraction of Pb(II) by sulfonamide ion exchangers. *Inorg. Chem.* **2005**, *44*, 7951-7959.
6. W. Zhang, Y. Cai, K. Kavallieratos, Investigation of sulfonamide ligands derived from o-Phenylenediamine and their Pb(II) complexes by ESI-MS. *Rapid Commun. Mass Spectrom.* **2006**, *20*, 303-308.
7. K. Kavallieratos, R. J. Alvarado and J. M. Rosenberg, Solvent extraction as a tool for toxic metal sensor design: Selective extraction and sensing of Pb(II) by simple disulfonamide ligands with unique coordination properties *Int. Solv. Extraction Conf.*, **2008**, Vol. 2, 843-848.
8. L. Yehiayan, M. Pattabiraman, K. Kavallieratos, X. Wang, L. H. Boise and Y. Cai, Speciation, formation, stability and analytical challenges of human arsenic metabolites *Journal of Analytical and Atomic Spectroscopy*, **2009**, *24*, 1397-1405.
9. K. Madrasi, M. S. Joshi, T. Gadkari, K. Kavallieratos, N. M. Tsoukias, Glutathiy radical as an intermediate in glutathione nitrosation *Free Radical Biology and Medicine*, **2012**, *53*, 1968-1976.
10. S. M. Namin, S Nofallah, M. S. Joshi, K. Kavallieratos, N. M. Tsoukias, Kinetic Analysis of DAF-FM activation by NO; *Nitric Oxide: Biology and Chemistry*, **2013**, *28*, 39-46.

Patent Applications and Patents issued

1. K. Kavallieratos, N. M. Tsoukias, and L. I. Lozano-Lewis "Organometallic dyes for NO detection and imaging" US Provisional Patent Application: No. 61/615,623, filed on March 26, 2012.
2. K. Kavallieratos, N. M. Tsoukias, and L. I. Lozano-Lewis "Organometallic dyes for NO detection and imaging" US Patent Office Full Application:Docket 29171/46884A - IP 1205, filed on March 26, 2013. (Conversion of 1, above). Issued on December 9, 2014: US Patent: 8,906,694.

Presentations in Conferences/Seminars (>100 total, >15 invited)

Invited Seminars

Old Dominion University (2015), University of Athens, Greece (2013), University of Nebraska-Kearney (2013), Doane College (2013), University of Alabama –Tuscaloosa (2013), Mississippi State (2013), Jackson State Univ. (2013), Tuskegee University (2013), Auburn University at Montgomery (2013), Xavier University - Louisiana (2013), Southeastern Louisiana University (2013), St. Thomas University (2013), University of Florida-Gainesville (2012), University of Central Florida (2012), Florida Memorial University (2012), Valdosta State University (2011), Jacksonville University (2011), University of North Florida (2011), Ave Maria University (2010), Univ. of Puerto Rico-Mayaguez (2010), Univ. of Puerto Rico-Rio-Piedras (2010), Morehouse College (2009), Florida Institute of Technology (2005), Barry University (2005, 2010), University of Wisconsin-Eau Claire (2005), University of Wisconsin–LaCrosse (2005), Univ. of Miami

(2005), Florida Atlantic University (2005), Temple University (2005), Valdosta State University (2002), University of Tennessee (2000), Louisiana Tech University (2000), Lawrence University, (2000), Merrimack College (2000).

Professional Societies

American Chemical Society, Sigma-Xi, National Academy of Inventors (FIU Chapter)

Course Development and Educational Innovation – Administrative roles

Prof. Kavallieratos has established two new graduate courses (Organometallic Chemistry, and Radiochemistry), and three new undergraduate courses (Fundamentals in Inorganic Chemistry and Undergraduate Radiochemistry and Lab) at FIU. He has taught large (CHM1032,CHM1033), medium (CHM3610,CHM4610) and small classes, at all undergraduate and graduate levels, included web-assisted classes. As part of his faculty HHMI Scholar Award he was engaged in educational reform involving Learning Assistants, and inverted classroom teaching practices that greatly improved educational outcomes, and has presented his educational research in national conferences. He has initiated in the Department of Chemistry and Biochemistry at FIU a new NSF-supported REU program, and has directed it since its inception in 2012, being also an active member of the National Chemistry REU Leadership Group and invited speaker on the REU Leadership Symposium at the Dallas, ACS Meeting (Spring 2014). He has also initiated and is serving as director of the *FIU Nuclear Scholarships and Fellowships Programs*, currently funded by two multi-year Nuclear Regulatory Commission (NRC) grants, and supports curriculum development for the newly established interdisciplinary FIU Nuclear Program funded by a separate 2-year NRC grant.

Synergistic activities

1. Reviewer for several journals including: J. Am. Chem. Soc., J. Org. Chem., Organometallics, Inorg. Chem., Crys. Growth and Design, Chem. Comm, Dalton. Reviewer for funding agencies including: NSF (panelist in several occasions), Res. Corp, and ACS/PRF.
2. Served as a panelist and judge in competitions (ABRCMS National Conference, DOE fellows competition and graduate and undergraduate student symposia).
3. Involved in STEM educational transformation efforts for undergraduate education, using Peer-Learning and Learning Assistant Initiatives, and inverted-classroom practices.
4. Serving as a founding faculty fellow of our STEM Transformation Institute and in the steering Committee of FIUTeach initiative, which aims in close collaboration of FIU with primary and secondary educational institutions for preparing and training K12 teachers. Invited to give high school presentations and organized invitations of K12 teachers to FIU in our chemistry career fair.
5. Serving as director of the *FIU Nuclear Scholarships and Fellowships Programs*, currently funded by two multi-year Nuclear Regulatory Commission (NRC) grants, and supports curriculum development for the newly established interdisciplinary FIU Nuclear Program funded by a separate 2-year NRC grant.
6. Active member of the National Chemistry NSF-REU Leadership Group and co-organizer of the REU current and prospective PI Symposium (San Antonio, TX, June 2015)

Collaborators & Co-Editors

S. Barlow, S. Marder, (GaTech), K. Bowman-James (Kansas), J. C. Bryan, (Wisconsin-LaCrosse), T. Ren, (Purdue), M. Zaworotko (U. South Florida), Y. Cai, J. Miksovská, N. Tsoukias, R. Raptis, A. Mebel, B. Rosen, D. Roelant (FIU).

Graduate Advisors and Postdoctoral Sponsors

R. H. Crabtree (Yale University) and B. A. Moyer (Oak Ridge National Laboratory, TN)

Thesis Advisor and Postgraduate-Scholar Sponsor

Graduate Students: R. A. Alvarado (Coral Reef School, Miami), R. Currie (Toronto), J. Duchene (Florida), T. Jonah (FIU), L. Lozano-Lewis (FIU), A. Pau (Virginia), M. Pattabiraman (U. Nebraska,

Kearney), J. M. Rosenberg (Florida), P.G. Samuda (Jamaica), I. Sweeney (US-FDA, Birmingham, AL), J. Vickaryous (Chimica Corp, Oregon).

Current and Pending Support

1. Granting Agency: National Science Foundation (NSF)
Status: Current; PI, 9/12-8/15, \$300,000
Topic: REU-Site: Sensing, Monitoring and Detection: From Molecules to Applications
2. Granting Agency: US Nuclear Regulatory Commission (NRC)
Status: Current; PI, 9/13-8/15, \$200,000
Topic: FIU Undergraduate Nuclear Research Scholarship Program
3. Granting Agency: US Nuclear Regulatory Commission (NRC)
Status: Current; PI, 9/14-8/18 \$400,000
Topic: FIU Graduate Nuclear Research Fellowship Program
4. Granting Agency: US Nuclear Regulatory Commission (NRC)
Status: Current (under NCE) Substituted effort (in place of Co-PI Almirall). Joerg Reinhold, PI, \$ 200,000
Topic: Nuclear Courses Curriculum Development
5. Granting Agency: US Department of Energy (DOE)
Contact: Department of Environmental Management-DOE-FIU Cooperative Agreement – Dr. Leo Lagos (ARC), PI (Subaward to KK for Task 20) To be awarded pending final DOE approval. 5/15-5/20
\$ 500,000 subaward (\$100,000 to be awarded for 5/15-5/16)
Topic: Innovative Nuclear Separations for High Level Radioactive Waste and Use of Soft-Donor Ligands for High-Level Waste Separations
6. Granting Agency: US Nuclear Regulatory Commission (NRC)-MSIP
Status: Pending; Co-PI (D. Roelant, PI), (if funded 10/2014-9/2016) \$400,000
Topic: Establishment of a new Radiological Sciences degree at FIU
7. Granting Agency: US Dept. of Energy (Basic Energy Sciences Catalysis Program)
Status: Pending; Co-PI (R. Raptis, PI), (6/2015-6/2018), \$660,000
Topic: Easily-accessible Cu^{III}-catalysts; Oxidation of organic substrates.
8. Granting Agency: US Dept. of Energy (Nuclear Energy University Programs)
Status: Pending; Co-PI (V. Anagnostopoulos, PI. D. Roelant Co-PIs) (if funded 7/2015-6/2016), \$170,614
Topic: Infrastructure Development for a Modern Radiochemistry Lab
9. Granting Agency: National Science Foundation – MRI Program
Status: Pending; Co-PI (R. Raptis-PI), \$400,580
Topic: Acquisition of an EPR spectrometer
10. Granting Agency: National Science Foundation – STC Center Proposal
Status: Pending; Role: Senior Personnel (T. Crowl-PI), \$25,000,000
Topic: Center of Environmental Aquatic Chemistry and Ecotoxicology (CEACE)