BIOGRAPHICAL SKETCH

Richard A. Ferrieri, Radiochemist
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EDUCATION AND TRAINING

Institution	Degree	Year	Field of Study
Fairfield University	B.S.	1975	Chemistry
Texas A&M University	Ph.D.	1978	Nuclear & Radiochemistry
Brookhaven National Laboratory	Postdoc	1979-1980	Chemistry

RESEARCH AND PROFESSIONAL EXPERIENCE

Science Advisor Board, Pivot Bio. Inc. (May 2018)
Adjunct Faculty, University Missouri (Columbia), Plant Sciences Division (Nov 2018)
Science Advisor Global Institute for Food Security, U. Saskatchewan (June 2017)
Vice-chair, DOE Environmental Molecular Sciences Laboratory User Executive Committee (June 2017)
Co-Director, Radiochemistry Sciences Institute (June 2017)
Member, U. Missouri Radiation Safety Council (May 2017)
Faculty Member Interdisciplinary Plant Group, U. Missouri (Aug 2016)
Research Faculty Professor, MURR (June 2016)
Director, DOE Radiochemistry SFA Program (June 2014-2016)
Co-PI Director, DOE Mesoscale Project (April 2014-present)
U. Missouri NSF EPSCor Program Advisory Committee (2013-present)
Adjunct Faculty, University Missouri (Columbia), Chemistry Department, 2009-present
Secretary, BNL Council (2013-2015)
BNL Life Sciences Quality Assurance Committee Chair (2006-2012)
Adjunct Faculty Montclair State University, Environmental Sciences, (2011-2014)
Scientist with Tenure, Brookhaven National Laboratory, 2009
Site Director, DOE Nuclear and Radiochemisty Summer School, 2006-2011
Chair, Life Science Quality Assurance Committee, 2007-2008
Chair, BNL Institutional Review Board, 2007
Deputy Chair, BNL Institutional Review Board, 2001-2006
Supervisor of Operations, BNL PET Radiotracer Laboratory, 1994 – 2006
Chemist (BNL Scientific staff with continuing appt.), 1988
Visiting Scientist, Chemistry Dept., UC Berkeley1986-1987
Associate Chemist, Chemistry Dept., BNL, 1983-1986
Assistant Chemist, Chemistry Dept., BNL, 1981-1982

U.S. PATENTS (6 PATENTS)

1. D-Y Kim, S. Kim, D. Alexoff and RA Ferrieri, Miniaturized module for preparing [^{11}C]hydrogen cyanide gas;" U.S. Patent No. 20130045151 A1
2. RA Ferrieri, DJ Schlyer and C Shea, "Method for Selective Recovery of PET-Usable Quantities of [^{18}F]-Fluoride and [^{13}N]-Nitrate/Nitrite from a Single Irradiation of Low Enriched [^{18}O]-Water;" U.S. Patent No. 5,425,063

3. RA Ferrieri, DJ Schlyer and DL Alexoff, "Apparatus and Method for Preparing Oxygen-15 Labeled Water in Injectable Form for use in Positron Emission Tomography;" U.S. Patent No. 5,482,865.
4. RA Ferrieri, DJ Schlyer and RJ Becker, "Optical Cell and Light Source for [^{18}F]Fluoride Radiotracer Synthesis," U.S. Patent No. 5,808,020.
5. DJ Schlyer, RA Ferrieri and C Koehler, "Accelerator Target;" U.S. Patent No. 5,917,874.
6. RA Ferrieri, "Application of Chiral Critical Clusters to Asymmetric Synthesis," U.S. Patent No. 6,486,355.

PUBLICATIONS FROM THE LAST 10 YEARS

1. L. Song, B. Agtuca, M.J. Schueller, S.S. Jurisson, G. Stacey, R.A. Ferrieri (2018) Relationship between carbon mobilization and root growth measured by carbon-11 tracer in Arabidopsis starch mutants. *J Plant Growth and Regulation* (doi.org/10.1007/s00344-018-9824-9).
2. M. Best, M.J. Schueller, R.A. Ferrieri (2018) Plant cell wall dynamics are regulated by intercellular sugar trafficking. *Int J Plant Stu* 1(1): 1-12.
3. Stereoselective Synthesis of L-[4-11C]-Asparagine via a Cyclic Sulfamidate Precursor." Y Xu, AS Cankaya, R Hoque, SJ Lee, C Shea, L Kersting, MJ Schueller, JS Fowler, D Alexoff, B Riehl, T Gleede, RA Ferrieri, W Qu. (2018) Eur. J Chemistry (in press, doi.org/10.1002/chem.201801029).
4. C. Staley, A.P. Ferrieri, M. Tfaily, Y. Cui, R. Chu, P. Wang, J. Shaw, C. Ansong, H. Brewe, A. Norbek, M. Markillie, F. do Amaral, T. Tuleski, T. Pellizzaro, B. Agtuca, R.A. Ferrieri, L. Pasa Tolic, S. Tring, G. Stacey, M.J. Sadowsky (2017) Diurnal cycling of rhizosphere bacterial communities is associated with shifts in carbon metabolism. *Microbiome* **5**: 65-78.
5. W. Qu, C.A.M. Robert, M. Erb, B.E. Hibbard, M. Paven, T. Gleede, B. Riehl, L. Kersting, A.S. Cankaya**,** A.T. Kunert, Y. Xu, M.J. Schueller, C. Shea, D. Alexoff, S.J. Lee, J.S. Fowler R.A. Ferrieri (2016) Dynamic precision phenotyping reveals mechanisms of crop tolerance to root herbivory. *Plant Physiology* **172**: 776-788.
6. V.C.S. Pankievicz, F.P. Amaral , K.F.D. Santos, B. Agtuca, Y. Xu, M.J. Schueller, A.C.M. Arisi, M.B.R. Steffens, E.M. de Souza, F.O. Pedrosa, G. Stacey, R.A. Ferrieri (2015) Robust biological nitrogen fixation in a model grass-bacterial association. *The Plant Journal* **81**: 907-919.
7. A. Karve, D. Alexoff, D. Kim, M.J. Schueller, R.A. Ferrieri; B. Babst. (2015) *In vivo* quantitative imaging of photoassimilate transport dynamics and allocation in large plants using a commercial positron emission tomography (PET) scanner. *BMC Plant Biology* **15**, 273-284.
8. D Kim, DL Alexoff, M Schueller, B Babst, RA Ferrieri, JS.Fowler, DJ.Schlyer (2015) The design and performance of a portable handheld $^{11}CO_2$ delivery system, Appl. Rad. & Isotopes 94: 338-343.
9. Y Xu, DL Alexoff, AT Kunert, W, Qu, D Kim, M Paven, BA Babst, RA Ferrieri, M.J. Schueller, J.S. Fowler (2014) Radiosynthesis of 3-indolyl[1-^{11}C]acetic acid for Phyto-PET-Imaging: An improved production procedure and formulation method. *Appl. Rad. & Isotopes* 91: 155-160.
10. C.A.M. Robert, R.A. Ferrieri, S. Schirmer, B.A. Babst, M.J. Schueller, R.A.R. Machado, C.C.M. Arce, B.E. Hibbard, J. Gershenzon, T.C.J. Turlings, M. Erb (2014) Induced carbon reallocation and compensatory growth as root herbivore tolerance mechanisms. *Plant Cell & Environment* **37**: 2613-2622.
11. B. Agtuca, E. Rieger, K. Hilger, L. Song, C. Robert, M. Erb, A. Karve, R.A. Ferrieri (2014) Carbon-11 reveals opposing roles of auxin and salicylate in regulating leaf physiology, leaf metabolism and resource allocation patterns that impact root growth in Zea mays. *J Plant Growth Re*gulation **33**: 328-339.

12. A.P. Ferrieri, B. Agtuca, H. Appel, R.A. Ferrieri, J.C. Schultz (2013) Getting to the root of the problem: methyl jasmonate induces temporal changes in carbon transport and partitioning in Arabidopsis thaliana that depend on root-shoot signaling. Plant Physiol. **161**: 692-704.

13. Budassi, M., S.P. Stoll, M.L. Purschke, J. Fried, B.A. Babst, RA Ferrieri, C.L. Woody, P. Vaska and D.J. Schlyer (2013). Imaging Performance of the BNL PET Imaging System for Plant Science. IEEE Nuclear Science Symposium and Medical Imaging Conference Record. Seoul, Korea. M16-22.

14. AP Ferrieri, H Appel, RA Ferrieri, JC Schultz (2012) Non-medical application of 2-[^{18}F]fluoro-2-deoxy-D-glucose to study defense responses in *Arabidopsis thaliana*. *J. Nucl. Med. & Biol.* 39: 1152-1160.

15. S Gómez, AD Steinbrenner, S Osorio, M Schueller, RA Ferrieri, A.R. Fernie, C.M. Orians (2012) From shoots to roots: transport and metabolic changes in tomato after feeding by a specialist lepidopteran. *Entomologia Experimentalis et. Applicata* 144: 101–111.

16. CAM Robert, N Veyrat, G Glauser, G Marti, G Doyen, N Villard, MDP Gaillard, TG Kollner, D Giron, M Body, BA Babst, RA Ferrieri, TCJ Turlings, M Erb (2012) Optimal pest foraging beats optimal crop defense: How a specialist herbivore uses defensive metabolites to locate nutritious roots. *Ecology Letters* 15: 55-64.

17. M Best, K Koenig, K McDonald, M Schueller, D Alexoff, A Rogers, RA Ferrieri (2011) Inhibition of trehalose metabolism impacts recent carbon partitioning into cell-wall components and reduces shoot-to-root ratio in *Nicotiana tabacum. Carbohydrate Res.* 346: 595-601.

18. A Reid, SW Kim, B Seinerc, JM Hooker, RA Ferrieri, BA Babst, JS Fowler (2011) Radiosynthesis of C-11 labeled Auxin (3-indolyl[1-11C]acetic acid) and its derivatives from gramine. J. Label Cmpds & Radiopharm. 54: 433-437.

19. S Gomez, RA Ferrieri, MJ Schueller, CM Orians (2010) Methyl jasmonate elicits rapid changes in carbon and nitrogen dynamics in tomato. *New Phytologist* 188: 835-844.

20. N Hanik, S Gómez, MJ Schueller, CM Orians, RA Ferrieri (2010) Use of gaseous $^{13}NH_3$ administered to intact leaves of Nicotiana tabacum to study changes in nitrogen utilization during defense induction. *Plant Cell & Environment* 33: 2173-2179.

21. N Hanik, S Gómez, M Best, MJ Schueller, CM Orians, RA Ferrieri (2010) Partitioning of new carbon as ^{11}C in *Nicotiana tabacum* reveals new insight into methyl jasmonate induced changes in metabolism. *J. Chemical Ecology* 36: 1058-1067.

22. MCK Kasel, MJ Schueller and RA Ferrieri (2010) Optimizing [^{13}N]N_2 radiochemistry for imaging nitrogen-fixation in root nodules of legumes. J. Label Cmpds & Radiopharm. 53: 592-597.

23. D van der Lelie, S Taghavi, S Monchy, L. Miller, RA Ferrieri, A. Rogers, N. Weyens, J. Vangronsveld, L. Newman Poplar and its bacterial endophytes: co-existence and harmony. *Critical Rev. Plant Sci*. 28: 346-358 (2009) *Critical Reviews in Plant Science*.

24. DL Alexoff, SM Dewey, P Vaska, RA Ferrieri, MJ Schueller, DJ Schlyer, JS Fowler (2009) PET imaging of escaping positrons from the leaf of a *Nicotiana tabacum Nucl. Med. & Biol.* 38: 191-200.

25. BA Babst, RA Ferrieri, MR Thorpe, CM Orians (2008) Gypsy moth (*Lymantria dispar*) herbivory induces rapid changes in carbon transport and partitioning in *Populus*. *Entomologia Experimentalis et. Applicata*. 128: 117–125.

BOOK CHAPTERS

1. RA Ferrieri, EP Rack, AP Wolf (1992) Stereo organic hot atom chemistry in "Handbook of Hot Atom Chemistry, published jointly by Kodansha Ltd. And VCH Verlagsgesellschaft mbH. (J-P Adloff, PP Gaspar, M Imamura, AG Maddock, T Matsuura, H Sano and K Yoshihara, eds.)
2. RA Ferrieri (1992) Hot atom chemistry of oxygen in "Handbook of Hot Atom Chemistry, published jointly by Kodansha Ltd. And VCH Verlagsgesellschaft mbH. (J-P Adloff, PP Gaspar, M Imamura, AG Maddock, T Matsuura, H Sano and K Yoshihara, eds.)
3. DJ Schlyer, ML Firouzbahkt, I Garcia, RA Ferrieri (1997) Correlation of hole-size in support windows with calculated yield strengths. Application of Accelerators in Research and Industry (JL Duggan and IL Morgan eds.) AIP Press, New York, pp 1363-1365.
4. RA Ferrieri, (2002) Production and Applications of Synthetic Precursors Labeled with Carbon-11 and Fluorine-18. In Handbook of Radiopharmaceuticals: Radiochemistry and Applications (MJ Welch and CS Redvanly eds.); John Wiley & Sons, Ltd.: United Kingdom, pp. 229-282.
5. R.A. Ferrieri, E. Herman, B. Babst, M.J. Schueller (2018) Managing the soil nitrogen cycle in agroecosystems, *Adv. In Soil Sci*. (R. Lal & B.A. Stewart, eds.) CRC Press, Chapter 14, p 343.

SYNERGISTIC ACTIVITIES

- Reviewer of grants: DOE, DOE-SBIR, NSF and NIH.
- Reviewer of manuscripts for: J. Label. Comp. & Radiopharm., Nucl. Instru. & Methods, J. Nucl. Medicine & Biology, Plant Physiology, Phytoremediation, J. Photochem, Planta, J. Plant, Cell & Environment, New Phytologist, J. Plant Signaling and Behavior, J. Plant Growth Regulation.
- Local organizing committee member for the 56th Annual Meeting of the Phytochemical Society of North America and the 2018 Interdisciplinary Plant Group Annual Symposium on Plant Metabolomics.
- Mentor and guest lecturer: Community Summer Science Programs (CSSP, SULI, CCP), U. Missouri Freshman Research in Plant Sciences Program, Missouri State High School Science Teachers Science Workshop, Missouri High School Student Salsa Camp for Urban Farming, Missouri State High School Scholars Academy.