Curriculum Vitae

I. General Information

a. Name: R. Scott Martin, Ph.D.

Rank: Professor (2011 – present)
Department Chair (2015 – 2021)
Graduate Program Director (2011 – 2015)

Primary Appointment: Department of Chemistry, Saint Louis University

Secondary Appointment: Department of Pharmacological & Physiological Science, Saint Louis University, 2010-present

b. Degrees Earned:

Ph.D., Analytical Chemistry, University of Missouri-Columbia, 1999

Thesis: "ChemChar Gasification of Radioactive, Inorganic, and Organic Laden Wastes"

Thesis Advisor: Stanley E. Manahan

M.S., Chemistry, Missouri State University, 1996

B.S., Chemistry (cum laude) Missouri State University, 1994

c. Academic Experience:

Department Chair, 2015 - 2021

College of Arts and Sciences Endowed Professor, 2011 – 2015

Graduate Program Director (2011 – 2015)

Professor of Chemistry, Saint Louis University, 2012 – present

Associate Professor of Chemistry, Saint Louis University, 2008 – 2012

Assistant Professor of Chemistry, Saint Louis University, 2003 – 2008

Assistant Professor of Chemistry, University of Iowa, 2002 – 2003

National Institutes of Health Post-Doctoral Fellow, University of Kansas, Department of Pharmaceutical Chemistry, 1999-2002

d. Academic Recognitions

1. Editor in Chief, Analytical Methods (2017-present)

2. AES Mid-Career Award, presented at SciX 2017 in Reno, NV

3. Associate Editor for *Analytical Methods* (RSC journal), 2013-2017 (editor for ~350 manuscripts a year)

4. Named Fellow, Royal Society of Chemistry (2014)

5. Named College of Arts and Sciences Endowed Professor of Chemistry, July 2011 - 2015

6. Graduate Mentor Award, Saint Louis University Graduate Student Association, 2011 (presented at the Arts and Sciences Pre-Commencement)

7. Secondary appointment in Department of Pharmacological & Physiological Science, Saint Louis University, 2010-present

8. Co-chair of 65th Midwestern Universities Analytical Chemistry Conference (MUACC), scheduled to be on the Saint Louis University Campus in Fall of 2011 (attended by ~100 faculty from Midwest Universities)

9. Member, Executive Council of Laboratory Automation Section, Society for Laboratory Automation and Screening, 2010-2011

10. Member, Board of Directors, Association for LabAutomation, 2009-2010

11. Associate Program Chair for LabAutomation 2008 and Program Chair for LabAutomation 2009. LabAutomation is the yearly conference for the Association for Laboratory Automation (~5,000 attendees)

12. Member, editorial board for *Electrophoresis* (2005-2008)

13. Award for Excellence in Research, Office of Research Services, Saint Louis University. Presented in April 2008 by Vice Provost Mike Dockter

14. Award for Excellence in Research, Office of Research Services, Saint Louis University. Presented in April 2005 by Dean Donald Brennan

15. National Institutes of Health Post-Doctoral Fellowship, 2000-2002

II. Publications

a. Peer reviewed publications from Saint Louis University

During SLU tenure (note: * denotes corresponding author, † denotes undergraduate research assistant, ‡ denotes graduate research assistant)

1. M.L. Kovarik,† N.J. Torrence,‡ D.M. Spence, and R.S. Martin,* "Fabrication of Carbon Microelectrodes with a Micromolding Technique and Their Use in Microchip-based Flow Analyses," *Analyst*, **2004**, *129*, 400-405.

2. M.K. Hulvey‡ and R.S. Martin,* "Microchip-Based Analysis Systems: An Undergraduate Laboratory Experiment," *Chem. Educator*, **2004**, *9*, 1-7.

3. N.A. Lacher, S.M. Lunte,* and R.S. Martin,* "Development of a Microfabricated Palladium Decoupler/Electrochemical Detector for Microchip Capillary Electrophoresis Using a Hybrid Glass/Poly(dimethylsiloxane) Device" *Anal. Chem.*, **2004**, *74*, 1136-1143. *(note: co-corresponding authors)*

4. A.K. Price,‡ D.J. Fischer, R.S. Martin, and D.M. Spence,* "Deformation-Induced Release of ATP from Erythrocytes in a Poly(dimethylsiloxane)-Based Microchip with Channels That Mimic Resistance Vessels," *Anal. Chem.*, **2004**, *76*, 4849-4855.

5. D.M. Spence,* N.J. Torrence,‡ M.L. Kovarik,† and R.S. Martin, "Amperometric Determination of Nitric Oxide Derived from Pulmonary Artery Endothelial Cells Immobilized in a Microchip Channel," *Analyst*, **2004**, *129*, 995-1000.

6. B.H. Huynh, B.A. Fogarty, R.S. Martin, and S.M. Lunte,* "On-Line Coupling of Microdialysis Sampling with Microchip-Based Capillary Electrophoresis," *Anal. Chem.*, **2004**, *76*, 6440-6447.

7. M.L. Kovarik,† M.W. Li,‡ and R.S. Martin,* "Integration of a Carbon Microelectrode with a Microfabricated Palladium Decoupler for use in Microchip Capillary Electrophoresis/Electrochemistry," *Electrophoresis*, **2005**, *26*, 202-210.

8. B.A. Fogarty, K.E. Heppert, T.J. Cory, K.R. Hulbutta, R.S. Martin and S.M. Lunte,* "Rapid Fabrication of Poly(dimethylsiloxane)-based Microchip Capillary Electrophoresis Devices using CO_2 Laser Ablation, *Analyst*, **2005**, *130*, 924-930.

9. C.M. Moore,‡ S.D. Minteer,* and R.S. Martin, "Microchip-based Ethanol/Oxygen Biofuel Cell," *Lab Chip*, **2005**, *5*, 218-225

10. M.W. Li,‡ D.M. Spence, and R.S. Martin,* "A Microchip-Based System for Immobilizing PC 12 Cells and Amperometrically Detecting Catecholamines Released After Stimulation with Calcium," *Electroanalysis*, **2005**, *17*, 1171-1180.

11. A.K. Price,‡ R.S. Martin, and D.M. Spence,* "Monitoring Erythrocytes in a Microchip Channel that Narrows Uniformly: Towards an Improved Microfluidic-based Mimic of the Microcirculation," *J. Chrom. A*, **2006**, *1111*, 220-227.

12. C.D. Kuhnline,† M.G. Gangel,† M.K. Hulvey,‡ and R.S. Martin,* "Detecting Thiols in a Microchip Device using Micromolded Carbon Ink Electrodes Modified with Cobalt Phthalocyanine," *Analyst*, **2006**, *131*, 202-207.

13. M.W. Li,‡ B.H. Huynh, M.K. Hulvey,‡ S.M. Lunte and R.S. Martin,* "Design and Characterization of Poly(dimethylsiloxane)-Based Valves for Interfacing

Continuous-Flow Sampling to Microchip Electrophoresis," *Anal. Chem.*, **2006**, *78*, 1042-1051.

14. M.J. Moehlenbrock,[‡] A.K. Price,[‡] and R.S. Martin,* "Use of Microchip-Based Hydrodynamic Focusing to Measure the Deformation-Induced Release of ATP from Erythrocytes," *Analyst*, **2006**, *131*, 930-937.

15. L.C. Mecker[‡] and R.S. Martin,* "Use of Micromolded Carbon Dual Electrodes with a Palladium Decoupler for Amperometric Detection in Microchip Electrophoresis," *Electrophoresis*, **2006**, *27*, 5032-5042

16. R.S. Martin, P.D. Root, and D.M. Spence,* "Microfluidic Technologies as Platforms for Performing Quantitative Cellular Analyses in an In Vitro Environment," *Analyst*, **2006**, *131*, 1197–1206.

17. M.W. Li[‡] and R. S. Martin,* "Integration of Continuous Flow Sampling to Microchip Electrophoresis using Poly(dimethylsiloxane)-based Valves in a Reversibly Sealed Device," *Electrophoresis*, **2007,** *28*, 2478–2488.

18. L.C. Mecker[‡] and R.S. Martin,* "Coupling Microdialysis Sampling to Microchip Electrophoresis in a Reversibly Sealed Device," *JALA*, **2007,** *12*, 296-302.

19. M.J. Moehlenbrock,[‡] and R.S. Martin,* "Development of an On-Chip Injector for Microchip-based Flow Analyses using Laminar Flow," *Lab Chip*, **2007**, 7, 1589-1596.

20. L.I. Genes, N. Villiere, M.K. Hulvey,[‡] R. S. Martin, and D.M. Spence,* "Addressing a Vascular Endothelium Array with Blood Components using Underlying Microfluidic Channels," *Lab Chip*, **2007**, 7, 1256-1259.

21. M.K. Hulvey,[‡] L. Genes, D.M. Spence, and R.S. Martin,* "Fabrication and Evaluation of a 3-Dimensional Microchip Device where Carbon Microelectrodes Individually Address Channels in the Separate Fluidic Layers," *Analyst*, **2007**, *132*, 1246-1253.

22. J.F. Kauffman,* S.J. Gilliam, and R.S. Martin, "Chemical Imaging of Pharmaceutical Materials: Fabrication of Micropatterned Resolution Targets," *Anal. Chem.*, **2008**, *80*, 5706-5712.

23. M.W. Li[‡] and R.S. Martin,* "Microchip-based Integration of Cell Immobilization, Electrophoresis, Post-Column Derivatization, and Fluorescence Detection for Monitoring the Release of Dopamine from PC 12 Cells," *Analyst*, **2008**, *133*, 1358-1366.

24. L.C. Mecker[‡] and R.S. Martin,* "Integration of Microdialysis Sampling and Microchip Electrophoresis with Electrochemical Detection," *Anal. Chem*, **2008**, *80*, 9257–9264.

25. M.K. Hulvey[‡] and R. S. Martin,* "A Microchip-based Endothelium Mimic Utilizing Open Reservoirs for Cell Immobilization and Integrated Carbon Ink Microelectrodes for Detection," *Anal. Bioanal. Chem.*, **2009**, *393*, 599-605.

26. N.G. Batz[‡] and R.S. Martin,* "Selective Detection of Endogenous Thiols Using Microchip-based Flow Analysis and Mercury/Gold Amalgam Microelectrodes," *Analyst*, **2009**, *34*, 372 – 379

27. I.Z Kiss,* N. Munjal,[†] R.S. Martin, "Synchronized Current Oscillations of Formic Acid Electro-oxidation in a Microchip-based Dual-Electrode Flow Cell," *Electrochimica Acta*, **2009**, *55*, 395-403

28. A.L. Bowen[‡] and R.S. Martin,* "Integration of serpentine channels for microchip electrophoresis with a palladium decoupler and electrochemical detection," *Electrophoresis*, **2009**, *30*, 3347–3354.

29. A.L. Bowen[‡] and R.S. Martin,* "Integration of On-Chip Peristaltic Pumps and Injection Valves with Microchip Electrophoresis and Electrochemical Detection," *Electrophoresis*, **2010,** *31*, 2534–2540.

30. D.C. Kirkpatrick,[†] C. Antwi, [‡] and R.S. Martin,* "Use of Recordable Compact Discs to Fabricate Electrodes for Microchip-based Analysis Systems," *Anal. Methods*, **2010**, *2*, 811-816. *(this was featured on the back cover of the journal)*

31. L.C. Mecker,[‡] L.A. Filla,[‡] and R.S. Martin,* "Use of a Carbon-ink Microelectrode Array for Signal Enhancement in Microchip Electrophoresis with Electrochemical Detection," *Electroanalysis*, **2010**, *22*, 2141 – 2146.
32. A. Selimovic,[‡] A.S. Johnson,[‡] I.Z. Kiss, and R.S. Martin,* "Use of epoxy-embedded electrodes to integrate electrochemical detection with microchip-based analysis systems," *Electrophoresis*, **2011**, 32, 822–831.
33. C. Antwi,[‡] A.S. Johnson,[‡] A. Selimovic,[‡] and R.S. Martin,* "Use of Microchip Electrophoresis and a Palladium/Mercury Amalgam Electrode for the Separation and Detection of Thiols," *Anal. Methods*, **2011**, *3*, 1072-1078.

34. P.A. Vogel, S.T. Halpin, R.S. Martin, and D.M. Spence**,* "**Microfluidic Transendothelial Electrical Resistance Measurement Device that Enables Blood Flow and Postgrowth Experiments**,"** *Anal. Chem*, **2011**, *83*, 4296–4301.

35. A.G. Cioffi,[†] R.S. Martin, and I.Z. Kiss,* **"**Oscillations of Nickel Electrodissolution in an Epoxy-Based Microchip Flow Cell," J. Electroanal. Chem., **2011**, *659*, 92-100.

36. L.A. Filla,[‡] D.C. Kirkpatrick,[†], and R.S. Martin,* "Use of a Corona Discharge to Selectivity Pattern a Hydrophilic/Hydrophobic Interface for Integrating Segmented Flow with Microchip Electrophoresis and Electrochemical Detection," *Anal. Chem.*, **2011**, *83*, 5996–6003.

37. A.S. Johnson[‡], A. Selimovic,[‡] and R.S. Martin,* "Integration of Microchip Electrophoresis with Electrochemical Detection Using an Epoxy-Based Molding Method to Embed Multiple Electrode Materials," *Electrophoresis*, **2011**, 32, 3121–3128.

38. A.S. Johnson,[‡] K.B. Anderson, S.T. Halpin, D.C. Kirkpatrick,[†], D.M. Spence and R. S. Martin, "Integration of multiple components in polystyrene-based microfluidic devices part I: fabrication and characterization," *Analyst*, **2013**, *138*, 129-136.

39. K.B. Anderson, S.T. Halpin, A.S. Johnson,[‡] R.S. Martin and D.M. Spence, "Integration of multiple components in polystyrene-based microfluidic devices part II: cellular analysis," *Analyst*, **2013**, *138*, 137-143.

40. A.S. Johnson[‡], A. Selimovic,[‡] and R.S. Martin,* Microchip-based Electrochemical Detection for Monitoring Cellular Systems," *Anal. Bioanal. Chem.*, **2013,** *405*, 3013–3020.

41. A. Selimovic,[‡] and R.S. Martin,* "Encapsulated Electrodes for Microchip Devices: Microarrays and Platinized Electrodes for Signal Enhancement," Electrophoresis, **2013**, *34*, 2092–2100.

42. K.B. Anderson, S.Y. Lockwood, R. S. Martin, and D.M. Spence,* "A 3D Printed Fluidic Device that Enables Integrated Features," *Anal. Chem.*, **2013**, *85*, 5622−5626.

43. V. Becirovic,[‡] S.R. Doonan,[†], and R.S. Martin,* "Encapsulation of Fluidic Tubing and Microelectrodes in Microfluidic Devices: Integrating Off-Chip Process and Coupling Conventional Capillary Electrophoresis with Electrochemical Detection," *Anal. Methods*, **2013**, *5*, 4220–4229.

44. Erkal, J. L.; Selimovic, A.; [‡] Gross, B. C.; Lockwood, S. Y.; Walton, E. L.; McNamara, S.; Martin, R. S.; Spence, D. M.,* "3D printed microfluidic devices with integrated versatile and reusable electrodes," *Lab Chip* **2014**, *14*, 2023-2032.

45. A. Selimovic,[‡] J.L. Erkal, Jayda L., D.M. Spence, R.S. Martin,* "Microfluidic device with tunable post arrays and integrated electrodes for studying cellular release," *Analyst*, **2014**, *139*, 5686-5694. (featured on the cover)

46. A.S. Johnson,[‡] B.T. Mehl,[‡] and R. S. Martin,* "Integrated hybrid polystyrene-polydimethylsiloxane device for monitoring cellular release with microchip electrophoresis and electrochemical detection," *Anal. Methods*, **2015**, *7*, 884 - 893.

47. M.R. Bailey, A.M. Pentecost,[‡] A. Selimovic,[‡] R.S. Martin, and Z.D. Schultz,* "Sheath-Flow Microfluidic Approach for Combined Surface Enhanced Raman

Scattering and Electrochemical Detection," *Anal. Chem.*, **2015**, *87*, 4347–4355.

48. A.M. Pentecost[‡] and R.S Martin,* "Fabrication and characterization of all-polystyrene microfluidic devices with integrated electrodes and tubing," *Anal. Methods*, **2015**, 7, 2968-2976.

49. Y. Jia, A. Bi, A. Selimovic,[‡] R.S. Martin, I. Z. Kiss,* Periodic and complex waveform current oscillations of copper electrodissolution in phosphoric acid in an epoxy-based microchip flow cell, *Journal of Solid State Electrochemistry*, **2015**, *19*, 3241-3251.

50. A. S. Munshi[‡] and R. S. Martin,* "Microchip-Based Electrochemical Detection using a 3-D Printed Wall-Jet Electrode Device," *Analyst,* **2016**,141, 862-869.

51. A. D. Townsend, [‡] G.H. Wilken, K.K. Mitchell, R. S. Martin, H. Macarthur,* "Simultaneous analysis of vascular norepinephrine and ATP release using an integrated microfluidic system," *J Neurosci Methods.,* **2016**, *266*, 68-77.

52. C. Chen,[‡] B.T. Mehl,[‡] S. A. Sell, R. S Martin,* "Use of electrospinning and dynamic air focusing to create three-dimensional cell culture scaffolds in microfluidic devices," *Analyst***, 2016**, *141*, 5311-5320.

53. A. V. Forzano,[‡] V. Becirovic,[‡] R. S. Martin, J.L. Edwards,* "Integrated electrodes and electrospray emitter for polymer microfluidic nanospray-MS interface," *Analytical Methods*, **2016**, *8*, 5152-5157

54. M.R. Bailey, R. S. Martin, Z.D. Schultz,* "Role of Surface Adsorption in the Surface-Enhanced Raman Scattering and Electrochemical Detection of Neurotransmitters," *Journal of Physical Chemistry C*, **2016**, *120*, 20624–20633.

55. C. Chen, B.T. Mehl,[‡] A. S. Munshi,[‡] A.D. Townsend,[‡] D.M. Spence, R.S. Martin,* "3D-printed microfluidic devices: fabrication, advantages and limitations—a mini review," *Anal. Methods*, **2016**, *8*, 6005-6012.

56. C. Chen, A.D. Townsend,[‡] S.A. Sell, R.S. Martin,* "Microchip-based 3D-Cell Culture Using Polymer Nanofibers Generated by Solution Blow Spinning," *Anal. Methods*, **2017**, *9*, 3274-3283.

57. B.T. Mehl[‡] and R.S. Martin,* "Enhanced microchip electrophoresis separations combined with electrochemical detection utilizing a capillary embedded in polystyrene," *Anal. Methods*, **2018**, *10*, 37-45.

58. C. Chen, A.D. Townsend,[‡] E.A. Hayter,[‡] Hannah M. Birk,[†] S.A. Sell, R.S. Martin,* Insert-based Microfluidics for 3D Cell Culture with Analysis, *Anal. Bioanal. Chem.*, **2018**, *10*, 3025-3035.

59. A.S. Munshi,‡ C. Chen, A.D. Townsend‡ and R.S. Martin,* "Use of 3D Printing and Modular Microfluidics to Integrate Cell Culture, Injections and Electrochemical Analysis," *Anal. Methods,* **2018**, *10*, 3364–3374.

60. M. J. Kimlinger† and R.S. Martin,* "The Use of a 3D-Printed Microfluidic Device and Pressure Mobilization for Integrating Capillary Electrophoresis with Electrochemical Detection," *Electroanalysis*, **2018**, *30*, 2241 – 2249.

61. Mehl, B.T.‡ and Martin, R.S.,* "Integrating 3D cell culture of PC12 cells with microchip-based electrochemical detection," *Anal. Methods*, **2019**,11, 1064-1072.

62. A.D. Townsend, R. S. Sprague, and R.S. Martin, "Microfluidic Device Using a Gold Pillar Array and Integrated Electrodes for On-chip Endothelial Cell Immobilization, Direct RBC Contact, and Amperometric Detection of Nitric Oxide, *Electroanalysis*, **2019**, 31, 1409–1415.

63. A. D. Castiaux, C. W. Pinger, E. A. Hayter, M. E. Bunn, R. S. Martin and D. M. Spence, PolyJet 3D-Printed Enclosed Microfluidic Channels without Photocurable Supports, *Analytical Chemistry*, **2019**, 91, 6910-6917.

64. Hayter, E. A.; Castiaux, A. D.; Martin, R. S., 3D-printed microfluidic device with in-line amperometric detection that also enables multi-modal detection, *Anal Methods* **2020**, 12, 2046-2051.

65. Castiaux, A. D.; Currens, E. R.; Martin, R. S., Direct embedding and versatile placement of electrodes in 3D printed microfluidic-devices, *Analyst* **2020**, 145, 3274-3282.

66. Huang, K., Castiaux, A. D., Podicheti, R., Rusch, D. B., Martin, R. S., Baker, L. A., A Hybrid Nanofiber/Paper Cell Culture Platform for Building a 3D Blood–Brain Barrier Model. *Small Methods* **2021**, 5, 2100592.

67. Castiaux, A.D., Selemani, Morgan A. Ward, M.A., Martin, R. S., Fully 3D printed Fluidic Devices with Integrated Valves and Pumps for Flow Injection Analysis, *Anal. Methods*, **2021**, in press (doi.org/10.1039/D1AY01569A).