

## **Larissa S. Fenn**

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Department of Chemistry  
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### **Education**

Vanderbilt University, Nashville, TN  
Attended: August 2005 to present  
Advisor: Prof. John A. McLean  
Degree obtained: Ph.D., Analytical Chemistry (May 2010)  
Dissertation: Detection and Characterization of Glycans and Glycoconjugates using Ion Mobility-Mass Spectrometry  
GPA: 3.687

Mercer University, Macon, GA  
Attended: August 2001-May 2005  
Degree obtained: Bachelor of Science in Chemistry with Departmental Honors, minor in mathematics  
GPA: 3.69 *cum laude*

University of Wales, Swansea, Great Britain  
Attended: August 2002-May 2003  
Participated in Study Abroad Program

### **Research Experience**

Vanderbilt University Graduate School – McLean lab, March 2006-present  
Specialize in ion mobility-mass spectrometry instrumentation – research grade and commercial (Waters Synapt HDMS); Matrix-assisted laser desorption/ionization and electrospray ionization; concentrated on biological samples with particular attention to carbohydrates and glycoproteins; Also used high performance liquid chromatography (LCMS) and tandem MS for fragmentation studies

### **Work Experience**

Rayonier, Inc., Jesup, GA  
May-August 2002-2004  
Customer Service Internship  
Immediate supervisor – Kimberly Jones (912) 588-8000  
Duties – Prepared shipment and insurance documents for air, land, and sea deliveries; Communicated with international offices; Converted all archived shipment bills for a period of approximately ten years to electronic format

### Selected Honors and Awards

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| 2009             | Barbara Stull Graduate Student Award from the Society of Applied Spectroscopy received at Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) annual conference |
| 2009             | Vanderbilt University Graduate School Dissertation Enhancement Grant for travel to study in the lab of Dr. J. Sabine Becker at the Research Centre Juelich, Germany               |
| 2009, 2008, 2007 | Vanderbilt Institute for Chemical Biology Annual Retreat Poster Award   |
| 2008, 2007       | 35 <sup>th</sup> and 34th Annual FACSS Conference Poster Award  |
| 2008, 2007       | Society for Applied Spectroscopy Piedmont Section Award for Travel to FACSS meeting in Reno, NV, and Memphis, TN  |
| 2008             | Nomination by Nashville Chapter of the Philanthropic Educational Organization (P.E.O.) for National Scholar Award   |
| 2007             | Outstanding Teaching Assistant Award from the Student Affiliates of the American Chemical Society (Department of Chemistry, Vanderbilt University)                                |
| 2006             | Tennessee Academy of Science Annual Meeting Student Oral Presentation Award   |
| 2006             | Wallace Odell DuVall Excellence in Leadership Award (Scholarship for graduate study, Mercer University)   |
| 2005             | Iota Sigma Pi (National Honor Society for Women in Chemistry) undergraduate award, Mercer University  |
| 2004             | ACS Division of Analytical Chemistry Undergraduate Award, Mercer University   |
| 2004             | Summer Undergraduate Research Experience (SURE), Emory University   |

### Publications – Peer Reviewed

13. **Larissa S. Fenn** and John A. McLean, "Simultaneous glycoproteomic strategies utilizing ion mobility-mass spectrometry," *Molecular BioSystems* **2009**, 5, 1298-1302. (Featured on front cover of Nov. 2009 issue)
12. **Larissa S. Fenn**, Michal Kliman, Ablatt Mahsut, Sophie R. Zhao, and John A. McLean, "Characterizing Ion Mobility-Mass Spectrometry Conformation Space for the Analysis of Complex Biological Samples," *Analytical and Bioanalytical Chemistry* **2009**, 394, 235-244.

11. **Larissa S. Fenn** and John A. McLean, "Enhanced carbohydrate structural selectivity by boronic acid derivitization and ion mobility-mass spectrometry analysis," *Chemical Communications*, **2008**, 43, 5505-5507.
10. **Larissa S. Fenn** and John A. McLean, "Biomolecular Structural Separations by Ion Mobility-Mass Spectrometry: New Prospects for Systems Biology," *Analytical and Bioanalytical Chemistry* **2008**, 391, 905-909.
9. John A. McLean, **Larissa S. Fenn**, and Jeffrey R. Enders, "Ion mobility-mass spectrometry Imaging," *Mass Spectrometric Imaging: History, Fundamentals and Protocols*, **Methods in Molecular Biology Series**, Jonathan V. Sweedler and Stanislav Rubakhin, eds. September 2010.
8. Kellen M. Harness, **Larissa S. Fenn**, David E. Cliffel, and John A. McLean, "Analysis of capping structural motifs on gold nanoparticles by ion mobility-mass spectrometry," *Analytical Chemistry* **2010**, 82, 3061-3066.
7. John A. McLean and **Larissa S. Fenn**, "Structural separations by ion mobility-MS for the characterization of glycoproteins", in preparation for *Mass Spectrometry of Glycoproteins*, **Methods in Molecular Biology Series**, Steven Patrie and Jennifer Kohler, eds.
6. LaKedra S. Pam, **Larissa L. Spell**, and James T. Kindt, "Simulation and theory of flexible equilibrium polymers under poor solvent conditions," *The Journal of Chemical Physics* **2007**, 126, 134906.
5. **Larissa S. Fenn** and John A. McLean, "Differentiation of carbohydrate structural isomers using MALDI-Ion Mobility-Mass Spectrometry", in preparation for submission to *Physical Chemistry & Chemical Physics*
4. **Larissa S. Fenn**, Cody Goodwin, Brian O. Bachmann, and John A. McLean, "Exploring conformation space for cyclic peptide natural products using ion mobility-mass spectrometry", In preparation for submission to *Journal of the American Chemical Society*
3. Whitney B. Ridenour, Michal Kliman, **Larissa S. Fenn**, John A. McLean, Richard M. Caprioli. "Structural characterization of pharmaceutical compounds by ion mobility-mass spectrometry". In preparation for submission to *Analytical Chemistry*
2. **Larissa S. Fenn** and John A. McLean, "Simultaneous glycoproteomics and glycolipidomics utilizing ion mobility-mass spectrometry," In preparation for submission to *Analytical Chemistry*
1. **Larissa S. Fenn**, Jerry Thomas (Molecular Probes), and John A. McLean, "Enhanced carbohydrate structural selectivity by derivitization using click chemistry," in preparation for submission

## Publications – Proceedings Papers

3. **L.S. Fenn**, M. Kliman, A. Mahsut, S. Zhao, T.J. Kerr, R.L. Gant, J.A. McLean, "Integrated 'omics' on the basis of structural separations by ion mobility-mass spectrometry", Proceedings of the American Society for Mass Spectrometry 57<sup>th</sup> Annual Conference, **2009**
2. **L.S. Fenn**, J.A. McLean, "Ion mobility shift strategies for structural characterization of carbohydrates," Proceedings of the American Society for Mass Spectrometry 56<sup>th</sup> Annual Conference, **2008**
1. **L.S. Fenn**, J.A. McLean, "Simultaneous glycomic and proteomic strategies using structural mass spectrometry," Proceedings of the American Society for Mass Spectrometry 55<sup>th</sup> Annual Conference, **2007**

## Presentations

27. **L.S. Fenn**, C. Goodwin, B.O. Bachmann, J.A. McLean, *Structural characterization of natural products from complex biological mixtures using ion mobility-mass spectrometry*, 36<sup>th</sup> Annual Federation of Analytical Chemistry and Spectroscopy Societies conference, Louisville, KY (October 2009) (invited talk)
26. **L.S. Fenn**, M. Kliman, R.L. Gant, T.J. Kerr, J.A. McLean, *Characterization of complex biological samples on the basis of structural separations by ion mobility-mass spectrometry*, 18<sup>th</sup> International Mass Spectrometry Conference, Bremen, Germany (Sept. 2009)
25. **L.S. Fenn**, M. Kliman, J.A. McLean, *Integrated 'omics' on the basis of structural separations by ion mobility-mass spectrometry*, 5<sup>th</sup> Annual Meeting of the Vanderbilt Institute for Chemical Biology, Nashville, TN (August 2009)
24. **L.S. Fenn**, M. Kliman, A. Mahsut, S. Zhao, T.J. Kerr, R.L. Gant, J.A. McLean, *Integrated 'omics' on the basis of structural separations by ion mobility-mass spectrometry*, American Society for Mass Spectrometry Annual Conference, Philadelphia, PA (June 2009)
23. **L.S. Fenn**, M. Kliman, A. Mahsut, S. Zhao, T.J. Kerr, R.L. Gant, J.A. McLean, *Integrated 'Omics' Using Structural Mass Spectrometry Strategies*, Southeast Regional Meeting of the American Chemical Society, Nashville, TN (November 2008)
22. C.R. Goodwin, A.P. Gies, D.M. Hercules, **L.S. Fenn**, J.A. McLean, *MALDI-IM-TOF-MS and CID Fragmentation Studies of Polyurethanes*, Southeast Regional Meeting of the American Chemical Society, Nashville, TN (November 2008)
21. A.P. Gies, **L.S. Fenn**, M. Kliman, J.A. McLean, D.M. Hercules, *MALDI-TOF MS Identification of Poly(p-phenylene terephthalamide) Branching and Metathesis Products*, Southeast Regional Meeting of the American Chemical Society, Nashville, TN (November 2008)

20. **L.S. Fenn** and J.A. McLean, *Simultaneous glycoproteomic strategies utilizing ion mobility-mass spectrometry: New insights from structural separations*, 35<sup>th</sup> Annual Federation of Analytical Chemistry and Spectroscopy Societies conference, Reno, NV (October 2008)
19. **L.S. Fenn** and J.A. McLean, *Ion mobility shift strategies for structural characterization of carbohydrates*, 4<sup>th</sup> Annual Meeting of the Vanderbilt Institute for Chemical Biology, Nashville, TN (August 2008)
18. J. R. Enders, **L. S. Fenn**, M. F. Aldersley, J. P. Ferris, P. C. Joshi, J. A. McLean, D. Zagorevski, *Ion Mobility Mass Spectrometry of the Products of Oligomerization of Activated Nucleotides with Montmorillonite*, American Society for Mass Spectrometry Annual Conference, Denver, CO (June 2008)
17. **L.S. Fenn** and J.A. McLean, *Ion mobility shift strategies for structural characterization of carbohydrates*, American Society for Mass Spectrometry Annual Conference, Denver, CO (June 2008)
16. **L.S. Fenn** and J.A. McLean, *Structural Separations of Positional and Structural Carbohydrate Isomers using Ion Mobility-Mass Spectrometry*, American Society for Mass Spectrometry Sanibel Conference, Ion Mobility and Related Emerging Areas, Daytona, FL, (January 2008)
15. **L. S. Fenn** and J. A. McLean, *Structural Characterization Strategies for Simultaneous Glycomics and Proteomics using Ion Mobility-Mass Spectrometry*, 34<sup>th</sup> Annual Federation of Analytical Chemistry and Spectroscopy Societies conference, Memphis, TN (October 2007).
14. N.V. Arinze, J.R. McLean, **L.S. Fenn**, J.A. McLean, *A Critical Comparison of Positively and Negatively-Charged Ion Structures using Ion Mobility-Mass Spectrometry*, 34<sup>th</sup> Annual Federation of Analytical Chemistry and Spectroscopy Societies conference, Memphis, TN (October 2007).
13. **L. S. Fenn** and J. A. McLean, *Simultaneous glycomic and proteomic strategies using structural mass spectrometry*, 3<sup>rd</sup> Annual Meeting of the Vanderbilt Institute for Chemical Biology, Nashville, TN (August 9<sup>th</sup>, 2007).
12. J. A. McLean, **L. S. Fenn**, T. Kerr, *Structural mass spectrometry separation strategies for proteomics, glycomics, and lipidomics: Ion mobility-MS and imaging ion mobility-MS*, Protein Society 21<sup>st</sup> Annual Symposium, Boston, MA (July 2007).
11. **L.S. Fenn** and J.A. McLean, *Simultaneous glycomic and proteomic strategies using structural mass spectrometry*, 55<sup>th</sup> Annual Meeting of the American Society for Mass Spectrometry, Indianapolis, IN (June 2007).
10. M. V. Ugarov, T. F. Egan, J. A. Schultz, **L. S. Fenn**, M. Kliman, J. A. McLean, S. N. Jackson, H.-Y. J. Wang, and A. S. Woods, *Study of Lipids in Tissues by Ion Mobility Time-Of-Flight Mass Spectrometry*, 55<sup>th</sup> Annual Meeting of the American Society for Mass Spectrometry, Indianapolis, IN (June 2007).

9. J. A. McLean and **L. L. Spell**, *Structural Ion Mobility-Mass Spectrometry Strategies for Glycomics and Glycoproteomics*, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON) Conference, Chicago, IL (March 2007).
8. **L.S. Fenn** and J.A. McLean, *Strategies in Glycomics and Proteomics using Structural Mass Spectrometry*, Vanderbilt University Center in Molecular Toxicology 40<sup>th</sup> Anniversary Symposium "Advances in Mass Spectrometry" Nashville, TN (April 14<sup>th</sup>, 2007).
7. **L.S. Fenn** and J.A. McLean, *Simultaneous glycomic and proteomic strategies using structural mass spectrometry*, Vanderbilt University Graduate Student Research Day, Nashville, TN (April 6<sup>th</sup>, 2007).
6. **L.S. Fenn**, T. Kerr, and J.A. McLean, *Advanced Structural Mass Spectrometry Approaches for Proteomics and Biophysics*, St. Jude Children's Research Hospital/Vanderbilt Institute for Chemical Biology Retreat, Florence, AL (March 23, 2007).
5. **L.S. Fenn** and J.A. McLean, *High-throughput detection and characterization of glycopeptides and glycoproteins using advanced structural mass spectrometry*, Tennessee Academy of Science Annual Meeting, Austin Peay University, Clarksville, TN (November 17<sup>th</sup>, 2006).
4. **L.L. Spell** and J.A. McLean, *Advanced Structural Mass Spectrometry Approaches to Proteomics and Biophysics*, 2<sup>nd</sup> Annual Vanderbilt Institute for Chemical Biology Retreat, Nashville, TN (August 8<sup>th</sup>, 2006).
3. **L. L. Spell**, M. Golden, and A.J. Pounds, *ab initio Study of Hydroxyl Radical Initiated Reactions of Elemental Mercury*, Mercer University Academic Research and Scholarly Activity, Macon, GA (May 2005).
2. F. Mobini, D. Moshkelani, **L. L. Spell**, B. Rainwater, N. C. Dopke, *Maintaining Traditions yet Making it New: A SAACS Chapter Celebrates National Chemistry Week*, Southeastern Conference of the American Chemical Society, Raleigh-Durham, NC (November 13, 2004).
1. **L. L. Spell**, M. Golden, and A.J. Pounds, *Exploring Conformational Space*, Mercer University Symposium for Undergraduate Research, Macon, GA (May 2002).

#### **Academic Volunteer Activities**

1. Vanderbilt University Department of Chemistry Steering Committee (2005-2007)
2. Vanderbilt Institute of Chemical Biology Annual Retreat Planning Committee (2009)
3. Chemical Biology Advisory Group (2009)

## **Professional Memberships/Leadership**

1. American Society for Mass Spectrometry
2. American Chemical Society
3. Society for Applied Spectroscopy
4. Coblenz Society

## **Teaching Experience**

**Teaching assistant**, Analytical Chemistry Lab  
September-December 2009, January-May 2007  
Vanderbilt University, Department of Chemistry

**Teaching assistant**, General Chemistry Lab  
August 2005-May 2006  
Vanderbilt University, Department of Chemistry

**Teaching assistant**, Organic Chemistry Lab  
January-May 2005  
Mercer University, Department of Chemistry

**Student instructor**, August 2004-May 2005  
Mercer University, Department of Interdisciplinary Studies

## **Volunteer Activities**

Adventure Science Center Special Event Volunteer, Nashville, TN (2009)

TWISTER (Tennessee Women in Science, Technology, and Engineering) volunteer,  
Nashville, TN (2009)

Vistacare hospice patient care volunteer, Macon, GA (2001-2005)

British Red Cross Oncology Volunteer, Singleton Hospital, Swansea, Wales, UK (2002-2003)