

YOUNG JIN LEE, PH D

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APPOINTMENT

2008 present **Assistant Professor**, Department of Chemistry, Iowa State University

2008 present **Faculty Scientist**, Ames Laboratory-USDOE

PROFESSIONAL EXPERIENCE

2002 2008 **Mass Spectrometry Specialist**, Genome Center (2006-2008), Molecular Structure Facility (2002-2005), University of California-Davis

1997 2000 **Senior Scientist**
Analysis Team, R&D Division, Hyundai Electronics, Cheongju-si, Korea

EDUCATION

2000 2002 **Postdoctoral Fellow**, Department of Chemistry, Indiana University
Advisor: Prof. David E. Clemmer

1997 *Ph. D in Physical Chemistry*, Seoul National University, Seoul, Korea
Advisor: Prof. Myung Soo Kim
Thesis: "Scattering angular distributions in collision-induced dissociation of some high mass ions".

1993 *M.S. in Chemistry*, Seoul National University, Seoul, Korea

1991 *B.S. in Chemistry*, Seoul National University, Seoul, Korea

INVITED TALK (MAJOR CONFERENCES OR INSTITUTIONS)

1. "Mass Spectrometry Imaging for the Localization of Plant Lipids in High Spatial Resolution", Young Jin Lee, Gordon Research Conference on 'Plant Lipids: Structure, Metabolism & Function', Jan 30th-Feb 4th, 2011, Galveston, TX.
2. "Single Cell Level, High Spatial Resolution Mass Spectrometry Imaging for Plant Metabolites", ACS Central Regional Meeting, Jun 8-10th, 2011, Indianapolis, IN.
3. "Mass Spectrometric Imaging of Plant Metabolites in Single Cell Level High Spatial Resolution", Imaging Symposium, Oct 25th-Oct 26th, 2010, Korean Basic Science Institute, Ochang, Korea.
4. "Biological Mass Spectrometry: From Proteomics and Structural Biology to Chemical Imaging and Bioenergy", Oct 28th, 2010, Seoul National University, Seoul, Korea.
5. "Mass Spectrometric Imaging of Plant Metabolites in Single Cell Level High Spatial Resolution", Imaging Symposium, Oct 29th, 2010, Konkuk University, Seoul, Korea.
6. "Mass Spectrometric Characterization of Biorenewables", American Chemical Society 239th National Meeting, Mar 25th, 2010, San Francisco, CA.

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7. "Mass Spectrometric Imaging of Plant Metabolites in Single Cell Level High Spatial Resolution", Department of Biological Sciences, University of North Texas, Denton, TX, Feb 19, 2010.
8. "Mass Spectrometric Imaging in High Spatial Resolution and High Mass Resolution for the Study of Plant Functional Genomics", 36th Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Marriott Hotel, Louisville, KY, October 18 - 22, 2009.

PUBLICATIONS

1. "Anomalous translational energy upshift in collisionally activated dissociation of hexafluorobenzene molecular ion", Y. J. Lee and M. S. Kim, *Chem. Phys. Lett.* 1992, **192**, 89-93; Erratum in *Chem. Phys. Lett.* 1992, **195**, 286.
2. "Anisotropic C-F bond cleavage in collisionally activated dissociation of a hexafluorobenzene molecular ion beam", Y. J. Lee and M. S. Kim, *J. Phys. Chem.* 1993, **97**, 1119-1124.
3. "C-F bond cleavage in collisionally activated dissociation of polyfluorinated molecular ions: Empirical structure-upward-shift correlation", Y. J. Lee and M. S. Kim, *Rapid Commun. Mass Spectrom.* 1993, **7**, 994-998.
4. "Analysis of mass-analyzed ion kinetic energy peak profiles. III. Analytical expression for a peak shape generated by collisionally activated dissociation", Y. J. Lee, H. Y. So, and M. S. Kim, *Rapid Commun. Mass Spectrom.* 1994, **8**, 571-577.
5. "Scattering angular distributions in collisionally activated dissociation of some high mass ions; Analysis of mass-analyzed ion kinetic energy peak shapes", Y. J. Lee and M. S. Kim, *J. Chem. Phys.* 1995, **103**, 5442-5450.
6. "Elimination of the multiple collision effect from a mass-analyzed ion kinetic energy profile in collision-induced dissociation of high mass ions", Y. J. Lee and M. S. Kim, *Int. J. Mass Spectrom. Ion Processes* 1997, **171**, 31-38.
7. "Collision-induced dissociation of cesium iodide cluster ions. Scattering angular distribution and excitation mechanism", Y. J. Lee and M. S. Kim, *J. Phys. Chem. A* 1997, **101**, 6148-6157.
8. "Correction of SIMS depth profile distorted by oxygen flooding", Y. J. Lee, C. S. Jung, M.-N. Yoon, S.-Y. Lee, *J. Korean Vacuum Soc.*, 2001, **10**, 225-233.
9. "Collision-Induced Dissociation of Mobility-Separated Ions using an Orifice-Skimmer Cone at the Back of a Drift Tube", Y. J. Lee, C. S. Hoaglund-Hyzer, J. A. Taraszka, G. A. Zientara, A. E. Counterman, D. E. Clemmer, *Anal. Chemistry*, 2001, **73**, 3549-3555.

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10. "Coupling Ion Mobility Separations, Collisional Activation Techniques, and Multiple Stages of MS for Analysis of Complex Peptide Mixtures", C. S. Hoaglund-Hyzer, **Y. J. Lee**, A. E. Counterman, D. E. Clemmer, *Anal. Chemistry*, 2002, **74**, 992-1006.
11. "Structural transitions of electrosprayed ubiquitin ions stored in an ion trap over ~10ms to 30s", S. Myung, E. R. Badman, **Y. J. Lee**, D.E. Clemmer, *J. Phys. Chem. A* 2002, **106**, 9976-9982.
12. "Development of high-throughput LC-injected ion mobility-Q-TOF techniques for analysis of complex peptide mixtures", **Y. J. Lee**, C. S. Hoaglund-Hyzer, C.A.S. Barnes, A. E. Hilderbrand, S. J. Valentine, D. E. Clemmer, *J. Chromatography B* 2002, **782**, 343-351 (invited for the special issue for proteomics).
13. "Development of High-Sensitivity Ion Trap-IMS-TOF Techniques: A High-Throughput Nano-LC/IMS/TOF Separation of the Drosophila Fly Proteome", S. Myung, **Y. J. Lee**, M. H. Moon, J. A. Taraszka, R. Sowell, S. Koeniger, A.E. Hilderbrand, S.J. Valentine, L. Cherbas, T. C. Kaufmann, D. F. Miller, Y. Mechref, M. V. Novotny, M. Ewing, D. E. Clemmer, *Anal. Chem.* 2003, **75**, 5137-5145
14. "c₁ Fragment Ions in Collision-induced Dissociation of Glutamine Containing Peptide Ions: A Tip for De Novo Sequencing" **Young Jin Lee** and Young Moo Lee, *Rapid Commun. Mass Spectrom.* 2004; **18**, 2069-2076.
15. "Development of Field Modulation in a Split-Field Drift Tube for High-Throughput Multi-dimensional Separations" S. L. Koeniger, S. J. Valentine, S. Myung, **Y. J. Lee**, D. E. Clemmer, *J. Proteome Research*. 2005, **4**, 25-35.
16. "Identification of proteins adducted by reactive metabolites of naphthalene and 1-nitronaphthalene in dissected airways of rhesus macaques", Ching Yu Lin, Bridget C. Boland, **Young Jin Lee**, Michelle R. Salemi, Dexter Morin, Lisa A. Miller, Charles G. Plopper, Alan R. Buckpitt, *Proteomics*, 2006, **6**, 972.
17. "Core of the Partner Switching Signaling Mechanism is Conserved in the Obligate Intracellular Pathogen *Chlamydia trachomatis*", Lei Hua, P. Scott Hefty, **Young Jin Lee**, Young Moo Lee, Richard S. Stephens, and Chester W. Price, *Molecular Microbiology*, 2006, **59**, 623.
18. "Proteome Analysis of Human Hair by Two Dimensional Liquid Chromatography Coupled with Tandem Mass Spectrometry (2-D LC-MS/MS): From Protein Identification to Posttranslational Modification", **Young Jin Lee**, Robert H. Rice, and Young Moo Lee, *Mol. Cell. Proteomics*, 2006, **5**, 789-800.

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19. "A Distinctive Repertoire of Contingency Genes Conferring Mutation-based Phase Variation and Combinatorial Expression of Surface Lipoproteins in *Mycoplasma capricolum* subsp. *capricolum* of the *Mycoplasma mycoides* Phylogenetic Cluster", Kim S. Wise, Mark F. Foecking, Kerstin Röske, **Young Jin Lee**, Young Moo Lee, Anup Madan, and Michael J. Calcutt, *J. Bacteriology*, 2006, **188**, 4926-4941.
20. "Extracellular glycosylphosphatidylinositol-anchored mannoproteins and proteases of *Cryptococcus neoformans*", Richard A. Eigenheer, **Young Jin Lee**, Eduardo Blumwald, Brett S. Phinney, Angie Gelli, *FEMS Yeast Research*, 2007, **7**, 499.
21. "The citrus fruit proteome: insights into citrus fruit metabolism", E. Katz, M. Fon, **Y.J. Lee**, B.S. Phinney, A. Sadka, E. Blumwald, *Planta*, 2007, **226**, 989-1005.
22. "FLOWERING LOCUS T Protein May Act as the Long-Distance Florigenic Signal in the Cucurbits", Ming-Kuelm Lin, Helene Belanger, Erika Varkonyi-Gasic, **Young-Jin Lee**, Erico Miura, Karla Gendler, Richard A. Jorgensen, Brett Phinney, Tony J. Lough and William J. Lucas, *Plant Cell*, 2007, **19**, 1488-1506.
23. "Shotgun Cross-linking Analysis for Studying Quaternary and Tertiary Protein Structures", **Young Jin Lee**, Laura L. Lachner, Jodi M. Nunnari, Brett S. Phinney, *J. Proteome Res.*, 2007, **6** (10), 3908 -3917. (first and corresponding author)
24. "Mass Spectrometry based Cross-linking Sites Mapping for Structural Elucidation of Protein and Protein Complex", **Young Jin Lee**, *Molecular Biosystems*, 2008, **4**, 816 (invited review).
25. "Founder mutations in the lipase H (LIPH) gene in families with autosomal recessive woolly hair/hypotrichosis". Yutaka Shimomura, Muhammad Wajid, Abraham Zlotogorski, Amelia Mohabir, **Young Jin Lee**, Robert H. Rice, and Angela M. Christiano, *J. Invest. Dermatology*, 129, 1927-1934, 2009.
26. "Distinguishing Mouse Strains by Proteomic Analysis of Pelage Hair", Robert H. Rice, David M. Rocke, Hua-Sheng Tsai, Kathleen A. Silva, **Young Jin Lee**, John P. Sundberg, *J. Invest. Dermatology*, 129, 2120-2125, 2009.
27. "Analysis of the Pumpkin Phloem Proteome Provides Functional Insights into Angiosperm Sieve Tube Function", Ming-Kuem Lin*, **Young-Jin Lee***, Tony J. Lough, Brett S. Phinney, and William J. Lucas, *Mol. Cell. Proteomics*, **8**, 343-356, 2009 (* equal contribution).
28. "Probability Based Shotgun Cross-Linking Sites Analysis", **Young Jin Lee**, *J. Am. Soc. Mass Spectrom.*, 20, 1896-1899, 2009.
29. "Crystal Structure of the Membrane Fusion Protein CusB from *Escherichia Coli*", Chih-Chia Su, Feng Yang, Feng Long, Deepak Reyon, Mathew D. Routh, Dennis W. Kuo, Adam K.

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- Mokhtari, Jonathan D. Van Ornam, Katherine L. Rabe, Julie A. Hoy, **Young Jin Lee**, Kanagalaghatta R. Rajashankar, Edward W. Yu, *J. Mol. Biol.*, 393(2):342-55, 2009.
30. "In Situ Probing of Cholesterol in Astrocytes at the Single Cell Level using Laser Desorption Ionization Mass Spectrometric Imaging with Colloidal Silver", D. C. Perdian, Sangwon Cha, Jisun Oh, Donald Sakaguchi, E. S. Yeung, and **Young Jin Lee**, *Rapid Commun. Mass Spectrom.* 24: 1147–1154, 2010.
 31. "High Spatial and High Mass Resolution Imaging of Surface Metabolites of Arabidopsis thaliana by Laser Desorption Ionization Mass Spectrometry using Colloidal Silver", Ji Hyun Jun, Zhihong Song, Zhenjiu Liu, Basil J. Nikolau, Edward S. Yeung, and **Young Jin Lee**, *Anal. Chem.* 82, 3255–3265, 2010; high-light article of the month at Anal Chem website.
 32. "Petroleomic Analysis of Bio-Oils from the Fast Pyrolysis of Biomass: Laser Desorption Ionization-Linear Ion Trap-Orbitrap Mass Spectrometry Approach", Erica A. Smith, **Young Jin Lee**, *Energy & Fuels*, 24, 5190-5198, 2010.
 33. "Pumpkin eIF5A isoforms interact with components of the translational machinery in the cucurbit sieve tube system", Yi Ma, Eriko Miura, Byung-Kook Ham, Hao-Wen Cheng, **Young-Jin Lee**, William J. Lucas, *Plant J.*, 64, 536-550, 2010.
 34. "Imaging MS Methodology for More Chemical Information in Less Data Acquisition Time Utilizing a Hybrid Linear Ion Trap-Orbitrap Mass Spectrometer", David C. Perdian, **Young Jin Lee**, *Anal. Chem.*, **82**, 9393-9400, 2010.
 35. "Protein profiling of the potato petiole under short day and long day photoperiods", Shweta Shah, **Young-Jin Lee**, David J. Hannapel, and A. Gururaj Rao, *J. Proteomics*, 74, 212-230, 2011.
 36. "Mass Spectrometric Imaging as a High-Spatial Resolution Tool for Functional Genomics: Tissue-Specific Gene Expression of TT7 Inferred from Heterogeneous Distribution of Metabolites in Arabidopsis flowers", Andrew R. Korte, Zhihong Song, Basil J. Nikolau, Young Jin Lee, *Analytical Methods*, 2012, 4 (2), 474 - 481.
 37. "Use of mass-spectrometry for imaging metabolites in plants", Young-Jin Lee, D.C. Perdian, Zhihong Song, Edward Yeung, Basil Nikolau, *The Plant Journal*, 2012, 70, 81-95.
 38. "Spatial mapping of lipids at cellular resolution in embryos of Gossypium hirsutum, L.", Patrick J. Horn, Andrew R. Korte, Purnima B. Neogi, Ebony Love, Johannes Fuchs, Kerstin Strupat, Ljudmilla Borisjuk, Vladimir Shulaev, Young Jin Lee, Kent D. Chapman, *Plant Cell*, 2012, 24, 622-636.

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39. "Bio-Oil Analysis Using Negative Electrospray Ionization: Comparative Study of High Resolution Mass Spectrometers and Phenolic vs. Sugaric Components", Erica A. Smith, Soojin Park, Adam T. Klein, and Young Jin Lee, published on Web in Energy & Fuels.
40. "High-Resolution Mass Spectrometric Characterization of Molecules on Biochar from Pyrolysis and Gasification of Switchgrass", D. Paul Cole, Erica A. Smith, Young Jin Lee, published on Web in Energy & Fuels.
41. "Gas Chromatography-High Resolution Tandem Mass Spectrometry using GC-APPI-LIT Orbitrap for Complex Volatile Compounds Analysis", Young-Jin Lee*, Erica A. Smith, Jihyun Jun, Mass Spectrom. Letters, 2012, 3, 29-38 (invited article).

Contributed Oral Presentations

1. "Novel MS Imaging Scheme for Concurrent Acquisition of High Mass Resolution, High Spatial Resolution, and MSn Imaging", Young-Jin Lee, DC Perdian, Pittcon Conference & Expo 2011, Mar 13-18th, 2011, Atlanta, GA.
2. "Mass Spectrometric Imaging of Plant metabolites in Single Cell Level High Spatial Resolution", Young-Jin Lee, 12th Congress of the 12th International Association for Plant Biotechnology, Jun 8th, 2010, St. Louis, MO.
3. "Mass Spectrometry Imaging of Plant Metabolites", Young Jin Lee, 2010 DOE Separations and Analysis research meeting, Apr 25th – Apr 28th, 2010, Baltimore, MD.
4. "Comprehensive Petroleomic Characterization of Biomass Pyrolysis Using FT-ICR and its Insights into Bio-oil Aging", Erica Smith, Marge Rover, Sunitha Sadula, Christopher Thompson, Robert Brown, Young Jin Lee, 59th ASMS Conference on Mass Spectrometry and Allied Topics, Jun 5th-Jun 9th, 2011, Denver, CO.
5. "More Information in Less Time: Strategies for High Spatial & High Mass Spectral Resolution Imaging Utilizing a Hybrid LIT-Orbitrap MS", David C. Perdian, Edward S. Yeung, Young Jin Lee, 58th ASMS Conference on Mass Spectrometry and Allied Topics, May 23rd-May 27th, 2010, Salt Lake City, UT.
6. "Applications of High Resolution Mass Spectrometry in the Analysis of Biofuels", Erica A. Smith, Robert C. Brown and Young Jin Lee, 44th Annual Midwest Meeting of the American Chemical Society, Iowa City, IA, Oct 21st – Oct 24th, 2009.
7. "Mass Spectrometric Imaging with high spatial and high mass resolution applied to reveal plant metabolite distribution altered by genetic mutation", Ji Hyun Jun, Zhenjiu Liu, Zhihong Song, Basil J. Nikolau, Edward S. Yeung, and Young-Jin Lee, 44th Annual Midwest Meeting of the American Chemical Society, Iowa City, IA, Oct 21st – Oct 24th, 2009.

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8. “Mass spectrometric imaging of plant metabolites on various organs: comparative study of genetically mutated Arabidopsis vs. wild type”, Ji Hyun Jun, Zhenjiu Liu, Zhihong Song, Basil J. Nikolau, Edward S. Yeung and Young Jin Lee*, 57th ASMS Conference on Mass Spectrometry and Allied Topics, May 3^{1st}-Jun 4th, 2009, Philadelphia, PA.

Other Academic Service

1. ASMS Review Committee for 2011 ASMS Conference, Meeting on Feb 26th, 2011.
2. Korean Society for Mass Spectrometry, US representative, since 2008.
3. Presider of the afternoon session of ‘Catalysis for Sustainability’ in 239th ACS conference at San Francisco, Mar 25th, 2010.
4. Invited lecturer in Science Bound program to URM high school students, Sep 24th, 2011, entitled ‘Analyze this and analyze that: Solving real world problems’.
5. Funding review:
 - a. Ad hoc reviewer for NIJ 2011 & 2012.
 - b. Ad hoc reviewer for Academy of Finland, 2011.
 - c. Ad hoc reviewer for DOE, 2010.
 - d. Ad hoc reviewer of Research Grants Council of Hong Kong, 2012.
6. Manuscript review: Analyst, Analytical Chemistry, Energy & Fuels, Rapid Commun. Mass spectrom, Science, Nature Chemical Biology, J. Proteomics, Proteomics, ACS Applied Materials & Interfaces, J. Am. Soc. Mass Spectrom.