

Edgar Augusto Arriaga

Education

- **Postdoctoral Research Associate**, Department of Chemistry, University of Alberta, Edmonton, Alberta, Canada, 1992-1994 (Advisor: Norman Dovichi)
- **Postdoctoral Research Associate**, Department of Physiology, University of Kansas Medical Center, Kansas City, Kansas, 1990-1992 (Advisors: Dennis Valenzano and Merrill Tarr)
- **Ph.D. in Analytical Chemistry**, Dalhousie University, Halifax, Nova Scotia, Canada, 1990 (Advisor: Dr. Roger Stephens)
- **Licenciatura en Química**, Universidad del Valle de Guatemala, Guatemala City, Guatemala, 1985 (Advisors: Sergio Aragon, SFSU and Elvira de Mejia, UNAM)

Employment

- **Visiting Professor**, Proteomics and Signal Transduction, Max-Planck Institut für Biochemie, Martinsried bei München, Germany, October 05 to October 2006
- **Associate Professor of Chemistry**, Department of Chemistry, University of Minnesota, Minneapolis, MN, August 2004 to present
- **Assistant Professor of Chemistry**, Department of Chemistry, University of Minnesota, Minneapolis, MN, August 1998 to 2004
- **Research Associate**, Department of Chemistry, University of Alberta, Edmonton, Alberta, 1994-1998
- **Production Manager**, Colortec S.A., Guatemala City, Guatemala, 1986
- **Quality Control Director**, Colortec S.A., Guatemala City, Guatemala, 1985
- **Undergraduate Research Assistant**, Pincasa S.A., Universidad del Valle, Guatemala City, Guatemala, 1983

Honors and Recognition

- 2007-2008 Fesler-Lampert Chair in Aging Studies, Center on Aging and the Graduate School, University of Minnesota.
- Research profiled in the News section of *Analytical Chemistry*, (*Anal. Chem.* **77**, 160A, (May 1, 2005), "Measuring Drugs in Individual Organelles", by Britt Erickson.
- Research profiled in *The Scientist*, 19(4), pp. 27-29, February 28, 2005, "Unraveling Cellular Biochemistry, One Cell at a Time: New Technologies Help Researchers Profile the Contents of Individual Living Cells", by Bennett Davis.
- Research on doxorubicin in individual mitochondrion featured in the Science & Technology Concentrates section of the July 19, 2004 issue of *Chemical & Engineering News*, 82(29); 19 (2004).
- KO2 NIH Career Award, Awarded December April 2003 – March 2008.
- 2001 Distinguished Mentor Award, President's Distinguished Faculty Mentor Program, University of Minnesota, 2001.
- Research featured in the *Chemical & Engineering News* article "Single Cells Up Close in Real Time", January 29, 2001, pp. 31-33.
- Research Innovation Award, Research Corporation, 2000.
- NATO Scholarship, ASI School of Photobiological Techniques, Kingston, Ontario, Canada 1990.
- Dalhousie Graduate Fellowship, Dalhousie University, Halifax, Nova Scotia, Canada (1986 - 1990).
- Distinguished Student Diploma, Universidad del Valle, Guatemala City, Guatemala, 1984.

- "Distinguished Undergraduate" Scholarship, Universidad del Valle, Guatemala City, Guatemala (1981 - 1982).

Appointments

- Member, Scientific Advisory Board, Microscale Bioseparations & Methods for Systems Biology Conference, February 2008 to present.
- NIH EBT Review Study Session, Permanent Member, October 2007 to present.
- Guest Editor, special issue on "Single Cell Analysis," *Analytical and Bioanalytical Chemistry* 387, January 2007.
- Editorial Board, The Open Analytical Chemistry Journal, 2007 to present.
- Member, Cancer Center at the University of Minnesota, November 2006 to present.
- Member, Graduate Faculty of the Integrated Biosciences Program, University of Minnesota, September 2005 to present
- Advisory Board, *Analytical and Bioanalytical Chemistry*, 2004 to present.
- Member, Advisory Board to the Center for Mass Spectrometry and Proteomics, University of Minnesota, 2004 to present.
- Selected as a participant in the Twelfth Annual Summer Training Course in Experimental Aging Research, San Antonio, Texas, June 5-10, 2004.
- Member, Graduate Faculty of the Department of Biomedical Engineering at the University of Minnesota, November 2001 to present.
- Preceptor, MD/Ph.D. Program, Medical School, University of Minnesota, October 2002 to present
- A-Page Advisory Panel, *Analytical Chemistry*, 2001 - 2003.

Professional Societies

- American Chemical Society
- Mitochondria Research Society
- American Association for the Advancement of Science
- ACS Professional Chemistry Fraternity
- Minnesota Chromatography Forum
- American Society for Mass Spectrometry

University of Minnesota Affiliations

- Scientists in Aging Research (Co-ordinators: LaDora Thompson, and Deb Ferrington, 2001 – 2005; Edgar Arriaga, 2007-2008).
- Molecular Nanosciences Alliance for Interdisciplinary Studies and Activities, 2001 – 2005
- NIH, Biotechnology Training Grant, (Director: Wei-Shou Hu)
- NIH, Chemistry-Biology Interface Training Grant, (Director: Larry Que)
- NIH, Functional Proteomics of Aging (Directors: LaDora Thompson, Deb Ferrington, Huber Warner)

Symposia Organization

- "Capillary Electrophoresis", Minnesota Chromatography Forum Spring Symposium, May 2001 (co-organizer with Mike Bowser)
- "Emerging Strategies for Subcellular Analysis", Pittcon 2003
- "Separation Techniques for Biological Nanostructures", Pittcon 2004
- "Subcellular Proteomics", Pittcon 2005
- "2008 Minnesota Aging Retreat", Center on Aging, 2008
- "Cellular and Sub-Cellular Separations", Pittcon 2009 (co-organizer with Dimitri Pappas, Texas Tech. University)

Publications

1. Arriaga, E. A.; Stephens, R. "Detection of Structured Interferences in a.c. Zeeman Atomic Absorption by Harmonic Analysis", *Spectrochim. Acta* **44B**, 867-76 (1989).
2. Valzeno, D. P.; Arriaga, E.; Trank, J.; Tarr, M. "Membrane Potential Can Influence the Rate of Membrane Photomodification", *Photochem. Photobiol.* **57**, 996-9 (1993).
3. Arriaga, E.; Chen, D. Y.; Cheng, X. L.; Dovichi, N. J. "High Efficiency Filter Fluorometer for Capillary Electrophoresis and Its Application to Fluorescein Thiocarbamyl Amino Acids", *J. Chromatogr., A* **652**, 347-53 (1993).
4. Tarr, M.; Arriaga E.; Goertz, K. K.; Valzeno, D. P. "Properties of Cardiac I_{Leak} Induced by Photosensitizer-Generated Reactive Oxygen", *Free Radical Biol. Med.* **16(4)**, 477-84 (1994).
5. Arriaga, E.; Frolov, A.; Tarr, M.; Valzeno, D. P. "Membrane Ionic Current Photomodification by Rose Bengal and Menadione: Role of Singlet Oxygen", *Photochem. Photobiol.* **59(6)**, 637-42 (1994).
6. Best, N.; Arriaga, E.; Chen, D. Y.; Dovichi, N. J. "Separation of Fragments up to 570 Bases in Length by Use of 6% T Non-Cross-Linked Polyacrylamide for DNA Sequencing in Capillary Electrophoresis", *Anal. Chem.* **66(22)**, 4063-7 (1994).
7. Figeys, D.; Arriaga, E.; Renborg, A.; Dovichi, N. J. "Use of the Fluorescent Intercalating Dyes POPO-3, YOYO-3 and YOYO-1 for Ultrasensitive Detection of Double-Stranded DNA Separated by Capillary Electrophoresis with Hydroxypropylmethyl Cellulose and Non-Cross-Linked Polyacrylamide", *J. Chromatogr., A* **669**, 205-16 (1994).
8. Lu, H.; Arriaga, E.; Chen, D. Y.; Starke, H.; Dovichi, N. J. "High-Speed and High-Accuracy DNA Sequencing by Capillary Gel Electrophoresis in a Simple, Low Cost Instrument: Two-Color Peak-Height Encoded Sequencing at 40^o C", *J. Chromatogr. A* **680**, 497-501 (1994).
9. Lu, H.; Arriaga, E.; Chen, D. Y.; Figeys, D.; Dovichi, N. J. "The Activation Energy of Single-Stranded DNA Moving through Cross-Linked Polyacrylamide Gels at 300 V/Cm: Effect of Temperature on Sequencing Rate in High-Electric-Field Capillary Gel Electrophoresis", *J. Chromatogr., A* **680**, 503-10 (1994).
10. Tarr, M.; Arriaga, E.; Valzeno, D. "Progression of Cardiac Potassium Current Modification after Brief Exposure to Reactive Oxygen", *J. Mol. Cell. Cardiol.* **27(5)**, 1099-109 (1995).
11. Arriaga, E. A.; Zhang, Y.; Dovichi, N. J. "Use of 3-(P-carboxybenzoyl)-quinoline-2-carboxaldehyde (CBQ) to Label Amino Acids for High Sensitivity Fluorescence Detection in Capillary Electrophoresis", *Anal. Chim. Acta* **299**, 319-26 (1995).
12. Craig, D.; Arriaga, E.; Banks, P.; Zhang, Y.; Renborg, A.; Palcic, M. M.; Dovichi, N. J. "Fluorescently-Based Enzymatic Assay by Capillary Electrophoresis Laser-Induced Fluorescence Detection for the Determination of a Few B-Galactosidase Molecules", *Anal. Biochem.* **226**, 147-53 (1995).
13. Pinto, D. M.; Arriaga, E. A.; Sia, S.; Li, Z.; Dovichi, N. J. "Solid-Phase Fluorescent Labeling Reaction of Picomole Amounts of Insulin in Very Dilute Solutions and Their Analysis by Capillary Electrophoresis", *Electrophoresis* **16**, 534-40 (1995).
14. Zhang, Y.; Arriaga, E.; Diedrich, P.; Hindsgaul, O.; Dovichi, N.J. "Nanomolar Determination of Aminated Sugars by Capillary Electrophoresis", *J. Chromatogr., A* **716**, 221-29 (1995).
15. Figeys, D.; Ahmadzadeh, H.; Arriaga, E.; Dovichi, N. J. "Pseudo-Coulometric Loading in Capillary Electrophoresis DNA Sequencing", *J. Chromatogr., A* **744**, 325-31 (1996).
16. Craig, D. B.; Arriaga, E.; Wong, J. C. Y.; Lu, H.; Dovichi, N. J. "Studies on Single Alkaline Phosphatase Molecules: Reaction Rate and Activation Energy of a Reaction Catalyzed by a Single Molecule and the Effect of Thermal Denaturation--The Death of an Enzyme", *J. Am. Chem. Soc.* **118** (22), 5245 -53 (1996).
17. Dovichi, N. J.; Le, X. C.; Arriaga, E.; Pinto, D. "Capillary Electrophoresis and Laser-Induced Fluorescence in Environmental Chemistry". In *Environmental Measurement and Analysis*; Koizumi, H., Ed.; Japan Science and Technology Corporation, 1997; pp 102-4.

18. Pinto, D. M.; Arriaga, E. A.; Craig, D.; Angelova, J.; Sharma, N.; Ahmadzadeh, H.; Dovichi, N. J. "Picomolar Assay of Native Proteins by Capillary Electrophoresis Precolumn Labeling, Submicellar Separation, and Laser-Induced Fluorescence Detection", *Anal. Chem.* **69**, 3015-21 (1997).
19. Craig, D. B.; Arriaga, E. A.; Wong, J. C. Y.; Lu, H.; Dovichi, N. J. "Single Alkaline Phosphatase Molecule Assay by Capillary Electrophoresis Laser-Induced Fluorescence Detection", *Tech. Protein Chem.*, VIII, 121-131 (1997).
20. Craig, D. B.; Arriaga, E.; Wong, J. C. Y.; Lu, H.; Dovichi, N. J. News & Features: "The Life and Death of a Single Enzyme Molecule", *Anal. Chem.* **70**, 39A-43A (1998).
21. Stathakis, C.; Arriaga, E. A.; Lewis, D. F.; Dovichi, N. J. "Cationic and Anionic Polymeric Additives for Wall Deactivation and Selectivity Control in the Capillary Electrophoretic Separation of Proteins in Food Samples", *J. Chromatogr., A* **817**, 227-32 (1998).
22. Stathakis, C.; Arriaga, E. A.; Dovichi, N. J. "Protein Profiling Employing Capillary Electrophoresis with Dendrimers as Pseudostationary Phase Media", *J. Chromatogr., A* **817**, 233-8 (1998).
23. Lee, I-H; Pinto, D.; Arriaga, E. A.; Dovichi, N. J. "Picomolar Analysis of Proteins Using Electrophoretically Mediated Microanalysis and Capillary Electrophoresis with Laser Induced Fluorescence Detection", *Anal. Chem.* **70**, 4546-8 (1998).
24. Craig, D. B.; Polakowski, R.; Wong, J. C. Y.; Arriaga, E. A.; Ahmadzadeh, H.; Stathakis, C.; Dovichi, N. J. "SDS-Capillary Electrophoresis of Proteins in a Sieving Matrix Utilizing Two-Spectral Channel Laser-Induced Fluorescence Detection", *Electrophoresis* **19**, 2175-78 (1998).
25. Ocvirk, G.; Salimi-Moosavi, H.; Szarka, R. J.; Arriaga, E. A.; Andersson, P. E.; Smith, R.; Dovichi, N. J.; Harrison, D. J. "Single Cell Enzymatic Analysis on a Microchip: Lysing of Single Cells and Identification of Their b-galactosidase Activity", Proceedings of Third Conference on Micro-total Analysis System, Banff, Alberta, Canada (1998).
26. Le, X. C.; Tan, W.; Scaman, C. H.; Szpacenko, A.; Arriaga, E.; Zhang, Y.; Dovichi, N. J.; Hindsgaul, O.; Palcic, M. M. "Single Cell Studies of Enzymatic Hydrolysis of a Tetramethylrhodamine Labeled Triglycoside in Yeast", *Glycobiology* **9**, 219-25 (1999).
27. Krylov, S. N.; Zhang, Z.; Chan, N. W. C.; Arriaga, E. A.; Palcic, M. M.; Dovichi, N. J. "Correlating Cell Cycle with Metabolism in Single Cells: Combination of Image and Metabolic Cytometry", *Cytometry* **37**, 14-20 (1999).
28. Krylov, S. N.; Arriaga, E.; Chan, N.W.C.; Dovichi, N.; Palcic, M.M. "Metabolic Cytometry: Monitoring Oligosaccharide Biosynthesis in Single Cells" in *Sialobiology and Other Novel Forms of Glycosylation*. Y. Inoue, Y.C. Lee, and F.A. Troy II, Eds., Gakushin Publishing, Osaka, Japan, 259-64 (1999).
29. Zhang, Z.; Krylov, S.; Arriaga, E. A.; Polakowski, R; Dovichi, N. J. "One-Dimensional Protein Analysis of an HT29 Human Colon Adenocarcinoma Cell", *Anal. Chem.* **72**, 318-22 (2000).
30. Krylov, S. N.; Starke, D. A.; Arriaga, E. A.; Zhang, Z.; Chan, N. W. C.; Palcic, M. M., Dovichi, N. J. Technical Notes: "Instrumentation for Chemical Cytometry", *Anal. Chem.* **72**, 872-7 (2000).
31. Krylov, S. N.; Arriaga, E. A.; Zhang, Z.; Chan, N. W. C.; Palcic, M. M; Dovichi, N. J. "Single-Cell Analysis Avoids Sample Processing Bias", *J. Chromatogr., B: Biomed. Sci. Appl.* **741**, 31-5 (2000).
32. Krylov, S. N.; Arriaga, E. A.; Chan, N. W. C.; Dovichi, N. J.; Palcic, M. M. "Metabolic Cytometry: Monitoring Oligosaccharide Biosynthesis in Single cells by Capillary Electrophoresis", *Anal. Biochem.* **283** (2), 133-5 (2000).
33. Duffy, C. F.; Gafoor, S.; Richards, D. F.; Admadzadeh, H.; O'Kennedy, R.; Arriaga, E. A. "Determination of Properties of Individual Liposomes by Capillary Electrophoresis with Post-Column Laser-Induced Fluorescence Detection", *Anal. Chem.* **73**, 1855-61 (2001)
34. Strack, A.; Duffy, C. F.; Malvey, M.; Arriaga, E. A. "Individual Mitochondrion Characterization: A Comparison of Classical Assays to Capillary Electrophoresis with Laser-Induced Fluorescence Detection", *Anal. Biochem.* **294**, 141-7 (2001).

35. Boulat, O.; McLaren, D. G.; Arriaga, E. A.; Chen, D. D. Y. "Separation of Free Amino Acids in Human Plasma by Capillary Electrophoresis with Laser Induced Fluorescence: Potential for Emergency Diagnosis of Inborn Errors of Metabolism", *J. Chromatogr., B: Biomed. Sci. Appl.* **754**, 217-28 (2001).
36. Duffy, C. F.; Fuller, K.; Malvey, M.; O'Kennedy, R.; Arriaga, E. A. "Determination of Electrophoretic Mobility Distributions through the Analysis of Individual Mitochondrial Events by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", *Anal. Chem.* **74**, 171-76 (2002).
37. Anderson, A.; Gergen, J.; Arriaga, E. A. "Detection of Doxorubicin and Metabolites in Cell Extracts and in Single Cells by Capillary Electrophoresis with Laser-Induced Fluorescence Detection". *J. Chromatogr., B* **769**, 97-106 (2002).
38. Fuller, K. M.; Duffy, C. F.; Arriaga, E. A. "Determination of the Cardiolipin Content of Individual Mitochondria by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", *Electrophoresis* **23**, 1571-76 (2002).
39. Duffy, C. F.; McEathron, A.; Arriaga, E. A. "Determination of Individual Microsphere Properties by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", *Electrophoresis* **23**, 2040-47 (2002).
40. Gunasekera, N.; Musier-Forsyth, K.; Arriaga, E. A. "Electrophoretic Behavior of Individual Nuclear Species as Determined by Capillary Electrophoresis with Laser-induced Fluorescence Detection", *Electrophoresis* **23**, 2110-16 (2002).
41. Anderson, A. B.; Ciriacks, C. M.; Fuller, K. M.; Arriaga, E. A. "Distribution of Zeptomole-Abundant Doxorubicin Metabolites in Subcellular Fractions by Capillary Electrophoresis with Laser-induced Fluorescence Detection", *Anal. Chem.* **75**, 8-15 (2003).
42. Fuller, K.; Arriaga, E. A. "Advances in Single Mitochondria Analysis", Invited review, *Curr. Opin. Biotechnol.* **14**, 35-41 (2003).
43. Fuller, K.; Arriaga, E. A. "Analysis of Individual Acidic Organelles by Capillary Electrophoresis with Laser-Induced Fluorescence Detection Facilitated by the Endocytosis of Fluorescently Labeled Microspheres", *Anal. Chem.* **75**, 2123-2130 (2003).
44. Presley, A. D.; Fuller, K. M.; Arriaga, E. A. "MitoTracker Green Labeling of Mitochondrial Proteins and Their Subsequent Analysis by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", *J. Chromatogr., B.* **793**, 141-150 (2003).
45. Pinto, D.; Arriaga, E. A.; Schoenherr, R.M.; Chou, S. S.-H.; Dovichi, N. J. "Kinetics and Apparent Activation Energy of the Reaction of the Fluorogenic Reagent 5-Furoylquinoline-3-carboxaldehyde with Ovalbumin", *J. Chromatogr., B* **793**, 107-114 (2003).
46. Xiong, G.; Aras, O.; Shet, A.; Key, N.; Arriaga, E. A. "Analysis of Individual Platelet-Derived Microparticles, Comparing Flow Cytometry and Capillary Electrophoresis with Laser-Induced Fluorescence Detection", *Analyst.* **128**, 581-588 (2003).
47. Ahmadzadeh, H.; Johnson, R. D.; Thompson, L.; Arriaga, E. A. "Direct Sampling from Muscle Cross Sections for Electrophoretic Analysis of Individual Mitochondria", *Anal. Chem.* **76**, 315-321 (2004).
48. Gunasekera, N.; Olson, K. J.; Musier-Forsyth, K.; Arriaga, E. A. "Capillary Electrophoretic Separation of Nuclei Released from Single Cells", *Anal. Chem.* **76**, 655-662 (2004).
49. Ocvirk, G.; Salimi-Moosavi, H.; Szarka, R. J.; Arriaga, E. A.; Andersson, P. E.; Smith, R.; Dovichi, N. J.; Harrison D.J. "b-Galactosidase Assays of Single Cell Lysates on a Microchip: A Complementary Method for Enzymatic Analysis of Single Cells," *Proc. IEEE* **92**, 115-25 (2004).
50. Gunasekera, N.; Xiong, G.; Musier-Forsyth, K.; Arriaga, E. A. "A Capillary Electrophoretic Method For Monitoring the Presence of a-Tubulin in Nuclear Preparations", *Anal. Biochem.* **330**, 1-9 (2004).
51. Fuller, K.; Arriaga, E. A. "Capillary Electrophoresis Monitors Changes in the Electrophoretic Behavior of Mitochondrial Preparations", *J. Chromatogr., B.* **806**, 151-9 (2004).

52. Ahmadzadeh, H.; Arriaga, E. A. Chapter 8, "From Cells to Instrumental Analysis" in *Sample Preparation for Hyphenated Analytical Techniques*. Jack Rosenfeld, Editor, Blackwell Publishing: Oxford, UK and CRC Press: Boca Raton, FL, 2004, pp. 173-190.
53. Anderson, A. B.; Arriaga, E. A. "Subcellular Metabolite Profiles of the Parent CCRF-CEM and the Derived CEM/C2 Cell Lines after Treatment with Doxorubicin", *J. Chromatogr., B* **808**, 295-302 (2004)
54. Arriaga, E. A. Book review of *Monolithic Materials: Preparation, Properties and Applications*, Journal of Chromatography Library, Volume 67, F. Svec, T.B. Tennikova, and Z. Deyl, eds., Elsevier: Amsterdam, 2003, in *J. Am. Chem. Soc.* **126**, 9874 (2004).
55. Gunasekera, N.; Lee, W. L.; Kim, S.; Musier-Forsyth, K.; Arriaga, E. A. "Nuclear Localization of Aminoacyl-tRNA Synthetases Using Single-Cell Capillary Electrophoresis Laser-Induced Fluorescence Analysis", *Anal. Chem.* **76**, 4741-6 (2004).
56. Anderson, A. B.; Xiong, G.; Arriaga, E. A. "Doxorubicin Accumulation in Individually Electrophoresed Organelles", *J. Am. Chem. Soc.* **126**, 9168-9 (2004).
57. Ahmadzadeh, H.; Dua, R.; Presley, A. D.; Arriaga, E. A. "Automated Analysis of Individual Particles Using a Commercial Capillary Electrophoresis System", *J. Chromatogr., A* **1064**, 107-14 (2005).
58. Chen, Y.; Walsh, R.; Arriaga, E. A. "Selective Determination of the Doxorubicin Content of Individual Acidic Organelles in Impure Subcellular Fractions", Accelerated Article, *Anal. Chem.* **77**, 2281-7 (2005).
59. Xiong, G.; Chen, Y.; Arriaga, E. A. "Measuring the Doxorubicin Content of Single Nuclei by Micellar Electrokinetic Capillary Chromatography with Laser-Induced Fluorescence Detection", *Anal. Chem.* **77**, 3488-93 (2005).
60. Olson, K. J.; Ahmadzadeh, H.; Arriaga, E. A. "Within the Cell: Analytical Techniques for Subcellular Analysis", *Anal. Bioanal. Chem.* **382**, 906-17 (2005).
61. Eder, A. E.; Arriaga, E. A., "Micellar Electrokinetic Capillary Chromatography Reveals Differences in Intracellular Metabolism between Liposomal and Free Doxorubicin Treatment of Human Leukemia Cell Lines", *J. Chromatogr., B: Anal. Technol. Biomed. Life Sci.* **829**, 115-22 (2005).
62. Ahmadzadeh, H.; Thompson, L.V.; Arriaga, E.A. "On-Column Labeling for Capillary Electrophoretic Analysis of Individual Mitochondria Sampled from Tissue Cross Sections", Technical Note, *Anal. Bioanal. Chem.* **384**, 169-74 (2006).
63. Chen, Y.; Arriaga, E.A. "Individual Acidic Organelle pH Measurements by Capillary Electrophoresis", *Anal. Chem.* **78**, 820-6 (2006).
64. Navratil, M.; Mabbott, G. A.; Arriaga, E.A. "Chemical Microscopy Applied to Biological Systems," Review, *Anal. Chem.* **78**, 4005-19 (2006).
65. Eder, A.R.; Chen, J.S.; Arriaga, E.A. "Separation of Doxorubicin and Doxorubicinol by Cyclodextrin-Modified Micellar Electrokinetic Capillary Chromatography", *Electrophoresis* **27**, 3263-70 (2006).
66. Duffy, C. F.; MacCraith, B.; Diamond, D.; O'Kennedy, R.; Arriaga, E.A. "Fast Electrophoretic Analysis of Individual Mitochondria Using Microchip Capillary Electrophoresis with Laser Induced Fluorescence Detection," *Lab Chip* **6**, 1007-11 (2006). This article was chosen for inclusion in the Royal Society of Chemistry's *Chemical Biology Virtual Journal*, Issue 15, 2006.
67. Meany, D.L.; Poe, B.G.; Navratil, M.; Moraes, C.T.; Arriaga, E.A. "Superoxide Released into the Mitochondrial Matrix", *Free Radical Biol. Med.* **41**, 950-9 (2006).
68. Eder, A.R.; Arriaga, E.A. "Capillary Electrophoresis Monitors Enhancement in Reactive Oxygen Species Production upon Treatment with Doxorubicin", *Chem. Res. Toxicol.* **19**, 1151-9 (2006).
69. Whiting, C.; Arriaga, E.A. "CE-LIF Analysis of Mitochondria Using Uncoated and Dynamically Coated Capillaries", *Electrophoresis* **27**, 4523-31 (2006).

70. Poe, B.G.; Navratil, M.; Arriaga, E.A. "Analysis of Subcellular-Sized Particles: Capillary Electrophoresis with Post-Column Laser-Induced Fluorescence Detection versus Flow Cytometry," *J. Chromatogr., A* **1137**, 249-55 (2006).
71. Forner, F.; Arriaga, E.A.; Mann, M. "Mild Protease Treatment as a Small-Scale Biochemical Method for Mitochondria Purification and Proteomic Mapping of Cytoplasm-Exposed Mitochondrial Proteins", *J. Proteome Res.* **5**, 3277-87 (2006).
72. Ahmadzadeh, H.; Andreyev, D.; Arriaga, E. A.; Thompson, L.V. "Capillary Electrophoresis Reveals Changes in Individual Mitochondrial Particles Associated with Skeletal Muscle Fiber Type and Age," *J. Gerontol. Series A: Biol. Sci. Med. Sci.* **61A**, 1211-18 (2006).
73. Sweedler, J.V., C.F.; Arriaga, E.A. "Single Cell Analysis," Editorial, *Anal. Bioanal. Chem.* **387**, 1-2 (2007), web publication, November 17, 2006.
74. Johnson, R.D.; Navratil, M.; Poe, B.G.; Xiong, G.; Olson, K.J.; Ahmadzadeh, H.; Andreyev, D.; Duffy, C.F.; Arriaga, E.A. "Analysis of Mitochondria Isolated from Single Cells," *Anal. Bioanal. Chem.* **387**, 107-18 (2007), web publication, August 26, 2006.
75. Poe, B.G.; Navratil, M.; Arriaga, E.A. "Absolute Quantitation of a Heteroplasmic Mitochondrial DNA Deletion Using a Multiplex Three-Primer Real-Time PCR Assay," *Anal. Biochem.* **362**, 193-200 (2007), web publication, December 24, 2006, doi: 10.1016/j.ab.2006.12.035.
76. Li, D.; Xie, H.; Thompson, L.V.; Arriaga, E.A.; Griffin, T.J. "Identification of Carbonylated Proteins from Enriched Rat Skeletal Muscle Mitochondria Using Affinity Chromatography-Stable Isotope Labeling and Tandem Mass Spectrometry", *Proteomics* **7**, 1150-1163 (2007).
77. Navratil, M.; Whiting, C.E.; Arriaga, E.A. "Microfluidic Devices for the Analysis of Single Cells: Leaving No Protein Uncounted", Perspective, *Sci. STKE* **2007** (388), pe29 (2007), web publication only, May 29, 2007, doi: 10.1126/stke.3882007pe29].
78. Whiting, C.E.; Arriaga, E.A. "Evaluation of Individual Particle Capillary Electrophoresis Experiments via Quantile Analysis", *J. Chromatogr., A* **1157**, 446-53 (2007).
79. Meany, D.L.; Thompson, L.V.; Arriaga, E.A. "Simultaneously Monitoring the Superoxide in the Mitochondrial Matrix and Extramitochondrial Space by Micellar Electrokinetic Chromatography with Laser-Induced Fluorescence", *Anal. Chem.* **79**, 4588-94 (2007).
80. Andreyev, D.; Arriaga, E.A. "Simultaneous Laser-Induced Fluorescence and Scattering Detection of Individual Particles Separated by Capillary Electrophoresis", *Anal. Chem.* **79**, 5474-8 (2007).
81. Chen, Y.; Xiong, G.; Arriaga, E. "CE Analysis of the Acidic Organelles of a Single Cell", *Electrophoresis* **28**, 2406-15 (2007).
82. Chen, Y.; Arriaga, E.A. "Individual Electrophoretic Mobilities of Liposomes and Acidic Organelles Displaying pH Gradients Across Their Membranes," *Langmuir* **23**, 5584 (2007).
83. Andreyev, D.S.; Arriaga, E.A. "Fabrication of Perforated Sub-Micron Silica Shells", *Sci. Mater.* **57**, 957-9 (2007), web publication, August 17, 2007.
84. Navratil, M.; Poe, B.G.; Arriaga, E.A. "Quantitation of DNA Copy Number in Individual Mitochondrial Particles by Capillary Electrophoresis," *Anal. Chem.* **79**, 7691-9 (2007).
85. Poe, B.G.; Arriaga, E.A. Chapter 20, "Subcellular Analysis by Capillary Electrophoresis," in *Handbook of Capillary and Microchip Electrophoresis and Associated Microtechniques*, 3rd edition, J.P. Landers, Editor, CRC Press: Boca Raton, FL, 2007, pp. 583 - 609.
86. Navratil, M.; Terman, A.; Arriaga, E.A. "Giant Mitochondria Do Not Fuse and Exchange Their Contents with Normal Mitochondria", *Exp. Cell Res.* **314**, 164-72 (2008), web publication September 2007.
87. Feng, J.; Arriaga, E.A. "Quantification of Carbonylated Proteins in Rat Skeletal Muscle Mitochondria Using Capillary Sieving Electrophoresis with Laser-Induced Fluorescence Detection", *Electrophoresis* **29**, 475-82 (2008).

88. Whiting, C.E.; Dua, R.; Duff, C.F; Arriaga, E.A. "The Statistical Limitations of Sampling Individual Particles on Microfluidic Devices with Orthogonal Laser Induced Fluorescence Detection", *Electrophoresis*, **29**, 1431-1440 (2008).
89. Wang, Y; Arriaga, E.A. "Monitoring Incorporation, Transformation and Subcellular Distribution of *N*-L-leucyl-doxorubicin in Uterine Sarcoma Cells Using Capillary Electrophoretic Techniques", *Cancer Lett. (Shannon, Irel.)*, web publication January 14, 2008.
90. Kostal, V.; Arriaga, E.A. "Recent Advances in the Analysis of Biological Particles by Capillary Electrophoresis", Review, *Electrophoresis*, **29**, 2578-2586 (2008).
91. Arriaga, E.A. "Within the aging muscle -Tools to investigate the role of mitochondria in aging", *Minnesota Physician*, Invited article for special issue on senior care. April 2008, 22(1), 24-25.
92. Kostal, V.; Arriaga, E.A. "Capillary electrophoresis in bioanalysis", (Invited Review) *Anal. Chem.* **80**, 4533-4550 (2008), web publication May 17, 2008.
93. Feng, J.; Navratil, M.; Thompson, L.V.; Arriaga, E.A. "Estimating relative carbonylation levels in muscle microstructures by fluorescence imaging", *Analytical and Bioanalytical Chemistry*, accepted.
94. Feng, J.; Xie, H.; Meany, D.L; Thompson, L.D.; Arriaga, E.A.; Griffin, T.J. "Quantitative Proteomic Profiling of Muscle- an Age-Dependent Protein Carbonylation in Rat Skeletal Muscle Mitochondria", *Journal of Gerontology: Biological Sciences*, accepted, June 2008.
95. Feng, J.; Navratil, M.; Thompson, L.V.; Arriaga, E.A. "Principal Component Analysis Reveals Age- and Muscle-Type Related Differences in Protein Carbonyl Profiles of Rat Skeletal Muscle Mitochondria", *Journal of Gerontology: Biological Sciences*, accepted, June 2008.

Patents

1. Anderson, P.; Arriaga, E.; Ocvirk, G.; Harrison, D.J. "Microchip based enzymatic analysis," Patented Application: CA 2230653, Filed: Feb. 27, 1998 by the University of Alberta

Invited Presentations

1. Arriaga, E. A.; Pinto, D.; Lee, L.; Zhang, Z.; Krylov, S.; Dovichi, N.J. "Exploring the Yoctomole Dimension: Proteins in Cells and Organelles", Federation of Analytical Chemistry and Spectroscopy Societies, **FACSS 1998**, Austin, Texas, October, 1998.
2. Arriaga, E. A.; Duffy, C.; Wolgamot, M.; Fuller, K.; Strack, A. "Mitochondrial Analysis by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", 46th International Conference on Analytical Sciences and Spectroscopy (**46th ICASS**), Winnipeg, Manitoba, Canada, August, 2000.
3. Arriaga, E. A.; Duffy, C.; Fuller, K.; Anderson, A.; Gunasekera, N.; Wolgamot, M. "Analysis of Individual Organelles by Capillary Electrophoresis with Laser-induced Fluorescence Detection", **Pacificchem 2000**, Honolulu, Hawaii, December 2000.
4. Arriaga, E. A.; Anderson, A.; Duffy, C. F.; Gunasekera, N., Fuller, K. "Analyzing Individual Organelles by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", 84th Canadian Society for Chemistry Conference (**84th CSC**), Montreal, Quebec, Canada, May 2001.
5. Arriaga, E. A. "Capillary Electrophoresis Analysis of Mitochondria, A Total Recount", **Gordon Conference in Analytical Chemistry**, New London, CT, June 2001.
6. Arriaga, E. A.; Anderson, A.; Gergen, Jamie, Ciriacks, C.; Abdalla, A. "Drug Metabolism and Distribution in Mammalian Single Cells", Federation of Analytical Chemistry and Spectroscopy Societies (**FACSS'2001**), Detroit, MI, October 2001.
7. Arriaga, E. A. "Developing Analytical Strategies for the Analysis of Subcellular Compartments", Leaders of the New Millennium Symposium, Federation of Analytical Chemistry and Spectroscopy Societies, (**FACSS'2001**), Detroit, MI, October 2001.
8. Arriaga, E. A.; Anderson, A.; Duffy, C.; Fuller, K.; Gunasekera, N.; McEathron, A.; Poe, B. "Electrophoretic Characterization of Subcellular Environments", **12th Frederick Conference** on Capillary Electrophoresis, Frederick, MD, October 2001.
9. Arriaga, E. A. "Individual Liposomes, A Prelude to Organelle Analysis", **Pittcon'2002**, New Orleans, LA, March 2002.
10. Anderson, A.B.; Fuller, K.M.; Xiong, G.; Ciriacks, C.; Arriaga, E.A. "Analysis of Organelles after Electrophoretic Mobilization", 26th International Symposium on High Performance Liquid Phase Separations and Related Techniques, (**HPLC 2002**), Montreal, Canada, June 2002.
11. Arriaga, E. A.; Fuller, K.M. "Mitochondrial Diversity as Seen by Capillary Electrophoresis", 85th Canadian Society for Chemistry Conference (**85th CSC**), Vancouver, BC, Canada, June 2002.
12. Arriaga, E. A.; Fuller, K.M.; Xiong, G.; Gunasekera, N. "Capillary Electrophoretic Separation of Isolated Organelles", **44th Rocky Mountain Conference on Analytical Chemistry**, Denver, CO, July-August 2002.
13. Fuller, K.M.; Gunasekera, N.; Poe, B.G.; Xiong, G.; Arriaga, E.A. "Exploring the Electrophoretic Behavior of Organelles", **224 National American Chemical Society Meeting**, Boston, MA, August 2002.
14. Anderson, A.; Xiong, G.; Arriaga, E.A. "Towards Profiling Subcellular Drug Distributions", **13th Frederick Conference** on Capillary Electrophoresis, Frederick, MD, October 2002.
15. Arriaga, E.A. "New Approaches in Individual Mitochondrial Analysis", **Mitochondria Interest Group, NIH**, (Video-Conference). November, 2002.
16. Fuller, K.M.; Gunasekera, N.; Johnson, R.; Xiong, G.; Arriaga, E.A. "Analysis of Isolated Organelles by Capillary Electrophoresis", **Pittcon'2003**, Orlando, FL, March 2003.
17. Arriaga, E.A. "Electrophoretic Behavior of Individual Organelles", **26th International Symposium on Capillary Chromatography & Electrophoresis**, Las Vegas, NV, May 2003.

18. Arriaga, E.A. "Electrophoretic Behavior of Individual Organelles", Federation of Analytical Chemistry and Spectroscopy Societies, (**FACSS'2003**), Fort Lauderdale, FL, October 2003.
19. Arriaga, E.A.; Whiting, C.; Olson, K.; Ahmadzadeh, H. "Using Microfluidic Devices For The Analysis Of Organelles", Federation of Analytical Chemistry and Spectroscopy Societies, (**FACSS'2003**), Fort Lauderdale, FL, October 2003.
20. Arriaga, E.A. "Subcellular Explorations by Capillary Electrophoresis", Latin American Conference in Capillary Electrophoresis (**LACE-2003**), Mexico City, Mexico, December 2003.
21. Arriaga, E.A.; Chen, Y. "Quantum Dots for Detection of Individual Acidic Organelles", **Pittcon'2004**, Chicago, IL, March 2004.
22. Arriaga, E.A.; Poe, B.; Walsh, R. "Fluorescently Guided Analysis of Organelles by Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry", **227th National ACS Meeting**, Anaheim, CA, April 2004.
23. Arriaga, E.A.; Johnson, R.D. "Analysis of Individual Organelles from Single Cells". **36th Central Regional ACS Meeting**, Indianapolis, IN, June 2004.
24. Arriaga, E.A.; Olson, K.; Whiting, C.; Duffy, C. "Exploring Mitochondrial Properties Using Microfluidic Devices", Federation of Analytical Chemistry and Spectroscopy Societies, (**FACSS'2004**), Portland, OR, October 2004.
25. Arriaga, E.A.; Olson, K.; Whiting, C.; Duffy, C. "Microfluidic Devices for Organelle Analysis", **15th Frederick Conference** on Capillary Electrophoresis/Proteomics, Frederick, MD, October 2004.
26. Johnson, R. D.; Xiong, G.; Ahmadzadeh, H.; Navratil, M.; Olson, K.; Arriaga, E. A. "Analysis of Individual Organelles from Single Cells", Latin American Conference in Capillary Electrophoresis (**LACE-2004**), Toledo, Spain, November 2004.
27. Navratil, M.; Walsh, R.; Poe, B.G.; Arriaga, E.A. "Analysis of Organelles by Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry and Itraqtm Technology", **Pittcon 2005**, Orlando, Florida, March 2005.
28. Arriaga, E.; Xiong, G.; Eder, A.; Eddy, C. "Determining the Subcellular Fate of Anti-Cancer Agents," **229th ACS National Meeting**, ACS Nobel Laureate Signature Award Symposium: Spectroscopy at the Nanoscale, San Diego, CA, March 2005.
29. Arriaga, E.A. "En Busca de la Fuente de la Juventud: Historia de la Mitocondria," **Converciencia 2005**, Hotel Camino Real, Guatemala City, Guatemala, July, 2005.
30. Arriaga, E.; Johnson, R.; Navratil, M.; Olson, K.; Chen, Y. "Heterogeneity in the Mitocondria of Single Cells Revealed by Individual Organelle Capillary Electrophoretic Analysis," **2nd Münster Conference on Single Cell Analysis**, Münster, Germany, December 2005.
31. Arriaga, E.; Li, D. "Capillary Electrophoretic Analysis of Individual Organelles Producing Reactive Oxygen Species", Microscale Bioseparations & Methods for Systems Biology Conference, (**MSB-2006**), Amsterdam, The Netherlands, January 2006.
32. Arriaga, E.; Eder, A.R.; Chen, Y.; Whiting, C.E.; Poe, B.G. "Subcellular Perspectives on Cancer Drug Treatments Based on Individual Organelle Analyses," **2006 Gordon Research Conference on Bioanalytical Sensors**, Session: Single Cell Analysis, Ventura, CA, February – March, 2006.
33. Arriaga, E.A.; Ahmadzadeh, H.; Sanow, W.; Eddy, C.; Hong, J.; Cressman, E. "Hyphenating Solid Tissue Sampling with Capillary Electrophoresis", Session for ACS Division of Analytical Chemistry Award for Young Investigators in Separation Science, **Pittcon 2006**, Orlando, FL, March 2006.
34. Arriaga, E.A. Invited Speaker, **NSF Workshop on "Analytical Instrumentation for Biomeasurements"** organized to determine future funding priorities, Session: "Multiscale Dynamics," Tucson, AZ, April 20-21, 2006.

35. Arriaga, E.A. "Capillary Electrophoresis, a New Tool to Analyze the Individual Organelles of Single Cells", **First International Workshop on Single Cell Analyses**, Uppsala University, Uppsala, Sweden, June 2006.
36. Arriaga, E.A.; Poe, B.G.; Navratil, M. "Within Individual Mitochondria: A Genomic Analysis", Symposium: Ralph N. Adams Award in Bioanalytical Chemistry, **Pittcon 2007**, Chicago, IL, February-March 2007.
37. Whiting, C.E.; Arriaga, E.A. "Individual Mitochondrial Analysis in Microfluidic Devices with Orthogonal Laser Induced Fluorescence Detection", **Canadian Society of Chemistry 2007 Conference**, Winnipeg, MB, May 2007.
38. Arriaga, E.A. "–Estamos Oxidados–Mitos y Realidades de Oxidantes y Anti-Oxidantes", Public Lecture. **Converciencia 2007**, Guatemala City, Guatemala, July, 2007.
39. Poe, B.G.; Andreyev, D.; Arriaga, E.A. "Fluorescence and Scattering Detection of Individual Particles by Capillary Electrophoresis and Flow Cytometry", Federation of Analytical Chemistry and Spectroscopy Societies, (**FACSS'2007**), Memphis, TN, October 2007.
40. Xu, X.; Arriaga, E.A. "Using Capillary Electrophoresis to Monitor the Formation and Effects of Reactive Oxygen Species", Latin American Conference in Capillary Electrophoresis (**LACE-2007**), Santiago, Chile, December 2007.
41. Arriaga, E.A. Xu, X.; Chen, Y.; Thompson, L. "Subcellular Analysis of Single Cells", Symposium: Chemical Cytometry: The Chemical Analysis of Single Cells, **Pittcon 2008**, New Orleans, LA, March 2008.
42. Arriaga, E.A.; Kostal, V.; Xu, X.; Warg, E.; Whiting, C.E. "Subcellular Analysis Using Microfluidic Systems", Symposium: Cellular Assays in Microfluidic Systems, **Pittcon 2008**, New Orleans, LA, March 2008.
43. Xu, X.; Sa, R.; Kostal, V.; Arriaga, E.A. "Separation of Oxidative Stress Markers from different Subcellular Environments", **Canadian Society of Chemistry 2008 Conference**, Edmonton, AB, May 2008.
44. Arriaga, E.A.; Navratil, M.; Feng, J.; Xu, X.; Sa, R.; Kostal, V. "Investigating the Role of Giant Mitochondria in Aging", **Chemical Biology Interface Training Grant Symposium**, University of Minnesota, Minneapolis, MN, May 2008.
45. Kostal, V.; Xu, X.; Arriaga, E.A. "Microfluidic devices for organelle analysis" (tentative title), Microscale Bioseparations & Methods for Systems Biology Conference, (**MSB-2009**), Boston, MA, February 2009 (Accepted).

Seminars

1. *Arriaga, E. A. "Análisis de biomoléculas usando electroforesis capilar con fluorescencia inducida por laser", Workshop. Primer Taller de Química Analítica de la **Universidad del Valle**, Guatemala City, Guatemala, 1995. (*Prior to Minnesota*)
2. *Arriaga, E. A.; "Shrinking Analytical Chemistry for Single Cell Analysis", Department of Chemistry, **University of Saskatchewan**, Saskatoon, Saskatchewan, Canada, January, 1998. (*Prior to Minnesota*)
3. Arriaga, E. A. "Exploring the Yoctomole Dimension: Proteins in Cells and Organelles", **Macalister College**, St. Paul, MN, November, 1998.
4. Arriaga, E. A. "CE-LIF for Single Cell Analysis", Biological Process Technology Institute, **University of Minnesota**, St. Paul, MN, November, 1998.
5. Arriaga, E. A. "Organelle Separations by Capillary Electrophoresis with Laser Induced Fluorescence Detection", **University of Minnesota–Duluth**, Duluth, MN, March, 1999.
6. Arriaga, E. A. "Análisis de Células y Organelos", **Universidad del Valle** de Guatemala, April, 2000.
7. Arriaga, E. A. "Organelle Analysis by Capillary Electrophoresis with Laser Induced Fluorescence Detection", **Saint Thomas University**, Saint Paul, MN, October, 1999.

8. Arriaga, E. A. "Single cell and Organelle Analysis by Capillary Electrophoresis with Laser Induced Fluorescence Detection", **University of Minnesota-Morris**, Morris, MN, October, 1999.
9. Arriaga, E. A. "Single cell and Organelle Analysis by Capillary Electrophoresis with Laser Induced Fluorescence Detection", **Ripon College**, Ripon, WI, November, 1999.
10. Arriaga, E. A. "Miniaturizing Analytical Chemistry: Analysis of Cells and Organelles", **North Dakota State University**, Fargo, ND, March, 2000.
11. Arriaga, E. A. "Mitochondrial Analysis by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **University of Wisconsin**, Oshkosh, Wisconsin, September, 2000.
12. Arriaga, E. A. "Looking for Answers inside the Cell: Organelle Analysis", **Dalhousie University**, Halifax, Nova Scotia, Canada, November 2000.
13. Arriaga, E. A. "Organelle Analysis by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **University of New Brunswick**, Fredericton, New Brunswick, Canada, November 2000.
14. Arriaga, E. A. "Looking for Answers inside the Cell: Organelle Analysis", **Acadia University**, Kentville, Nova Scotia, Canada, November 2000.
15. Arriaga, E. A. "Organelle Analysis by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **Saint Mary's University**, Halifax, Nova Scotia, Canada, November 2000.
16. Arriaga, E. A. "Looking for Answers inside the Cell: Organelle Analysis", **University of Manitoba**, Winnipeg, Manitoba, Canada, January 2001.
17. Arriaga, E. A. "Looking for Answers inside the Cell: Organelle Analysis", **University of Winnipeg**, Winnipeg, Manitoba, Canada, January 2001.
18. Arriaga, E. A. "Looking for Answers inside the Cell: Organelle Analysis", **University of Illinois**, Urbana-Champaign, IL, January 2001.
19. Arriaga, E.A. "New Analytical Strategies for Subcellular Compartments", Chemical Biology Colloquium, **University of Minnesota**, October, 2001.
20. Arriaga, E. A. "Identification of Subcellular Components by Capillary Electrophoresis", **University of Wisconsin**, Eau-Claire, WI, November 2001.
21. Arriaga, E.A. "Use of Capillary Electrophoresis for the Analysis of Single Cells", **Gustavus Adolphus College**, St. Peter, MN, November, 2001.
22. Arriaga, E.A. "Electrophoretic Characterization of Subcellular Environments", **Pennsylvania State University**, College Station, PA, February, 2002.
23. Arriaga, E. A. "Microfabrication, Analysis and Manipulation of Cellular Organelles," Medtronic Forum, Minneapolis, MN, February, 2002.
24. Arriaga, E.A. "Electrophoretic Characterization of Subcellular Environments", **University of Arizona**, Tucson, AZ, April, 2002.
25. Arriaga, E.A. "Nuevas estrategias bioanalíticas para investigar el interior de la célula", **Universidad del Valle de Guatemala**, Guatemala City, Guatemala, May 2002.
26. Arriaga, E.A. "Studying Subcellular Diversity: Electrophoretic Characterization of Individual Organelles", **San Francisco State University**, San Francisco, CA, May, 2002.
27. Arriaga, E.A. "How many Cardiolipin Molecules are there in an Individual Mitochondrion", *Molecular Biophysics, Biotechnology, and Chemistry-Biology Interface Training Grant Symposium*, **University of Minnesota**, St. Paul, MN, May 2002.
28. Arriaga, E.A. "Emerging Strategies for Subcellular Analysis", **University of Arizona**, Tucson, AZ, September, 2002.
29. Arriaga, E.A. "Analysis of Isolated Organelles by Capillary Electrophoresis", **York University**, York, Ontario, Canada, October 2002.

30. Arriaga, E.A. "Expanding the Scope of Capillary Electrophoresis to the Analysis of Particles and Organelles", **University of Toronto**, Toronto, Ontario, Canada, October 2002.
31. Arriaga, E.A. "Analysis of Isolated Organelles by Capillary Electrophoresis", **University of Western Ontario**, London, Ontario, Canada, October 2002.
32. Arriaga, E.A. "Diagnosing Heteroplasmy at an Early Stage: Individual Mitochondrial Measurements". **Department of Biomedical Engineering, University of Minnesota**, Minneapolis, MN, October 2002.
33. Arriaga, E.A. "Analysis of Isolated Organelles by Capillary Electrophoresis", **Saint Olaf College**, Northfield, MN, November 2002.
34. Arriaga, E.A. "New Approaches in Individual Mitochondrial Analysis", **Mitochondria Interest Group, NIH**, (Video-Conference). November, 2002.
35. Arriaga, E.A. "Analysis of the Subcellular Distribution and Metabolism of Anti-Cancer Drugs", **University of Pittsburgh**, Pittsburgh, PA, November, 2002.
36. Arriaga, E.A. "Emerging Strategies for Subcellular Analysis", **Iowa State University**, Ames, IA, November, 2002.
37. Arriaga, E.A. "Analysis of Isolated Organelles by Capillary Electrophoresis", **Saint Cloud State University**, Saint Cloud, MN, November 2002.
38. Arriaga, E.A. "Emerging Strategies for Subcellular Analysis", **University of Alberta**, Edmonton, Alberta, Canada, January, 2003.
39. Arriaga, E.A. "Looking for Answers Inside the Cell", **Truman State University**, Kirksville, MO, March, 2003.
40. Arriaga, E.A. "Emerging Strategies for Subcellular Analysis", **University of Iowa**, Iowa City, IA, April, 2003.
41. Arriaga, E.A. "Analysis of Mitochondria: Uncovering the Secrets of Aging", **California State University**, Los Angeles, CA, April, 2003.
42. Arriaga, E.A. "Emerging Strategies for Subcellular Analysis", **Dublin City University**, Dublin, Ireland, September, 2003.
43. Arriaga, E.A. "Investigating the Electrophoretic Mobilities of Individual Organelles", **Georgia State University**, Atlanta, GA, October, 2003.
44. Arriaga, E.A. "Analyzing Organelles from Single Cells", **Pomona College**, Claremont, CA, October, 2003.
45. Arriaga, E.A. "Subcellular Explorations by Capillary Electrophoresis", **Southern Illinois University**, Carbondale, IL, November, 2003.
46. Arriaga, E.A. "Emerging Strategies for Subcellular Analysis", **University of Texas**, Austin, TX, November, 2003.
47. Arriaga, E.A. "Analysis of Individual Organelles Released from Single Cells", **Vanderbilt University**, Nashville, TN, October, 2004.
48. Arriaga, E.A. "Analysis of Individual Organelles from Single Cells", Dept. of Biochem. Mol. Biol. & Biophysics, **University of Minnesota**, November, 2004.
49. Arriaga, E.A. "Measuring Properties of Organelles Sampled from Single Cells and Muscle Fibers", Dept. of Chemistry, **University of Washington**, Seattle, WA, March, 2005.
50. Arriaga, E.A. "Measuring Properties of Organelles Sampled from Single Cells and Muscle Fibers", **Wake Forest University**, Winston-Salem, NC, March, 2005.
51. Arriaga, E.A. "En Busca de la Fuente de la Juventud: Historia de la Mitocondria", Facultad de Medicina, **Universidad San Carlos de Guatemala**, Guatemala City, Guatemala, July, 2005.
52. Arriaga, E.A. "New Approaches to Elucidate the Role of Acidic Organelles in Drug-Resistance", Department of Pharmaceutical Chemistry, **University of Kansas**, Lawrence, KS, September, 2005.

53. Arriaga, E.A. "Pushing the Limits of Bioanalysis: Single Cells and Individual Organelles", Institute of Analytical Chemistry, **Academy of Sciences of the Czech Republic**, Brno, Czech Republic, May 2006.
54. Arriaga, E.A. "Measuring the Properties of Individual Biological Particles by Capillary Electrophoresis", Institute of Hydrochemistry and Chemical Balneology, **Technical University of Munich**, Munich, Germany, June 2006.
55. Arriaga, E.A. "Mining Single Cells: Analysis of Individual Mitochondria from Single Cells", Institute of Human Genetics, GSF – **National Research Center for Environment and Health and TUM Klinikum Rechts der Isar**, Munich-Neuherberg, Germany, October 2006.
56. Arriaga, E.A. "Analyzing Organelles from Single Mammalian Cells", Institute for Analytical Chemistry, **University of Vienna**, Vienna, Austria, October 2006.
57. Arriaga, E.A. "Interrogating Individual Organelles and Other Biological Particles", Department of Chemistry, **University of British Columbia**, Vancouver, British Columbia, Canada, November 2006.
58. Arriaga, E.A. "Sensitive Analysis of the Subcellular Distributions and Effects of Anthracyclines", Department of Medicinal Chemistry, **University of Minnesota**, Minneapolis, MN, December 2006.
59. Arriaga, E.A. "Analysis of Individual Organelles Taken from Single Cells", Department of Chemistry, **University of California**, Riverside, CA, March 2007.
60. Arriaga, E.A. "Within Individual Mitochondria, a Genomic Analysis", Department of Chemistry, **University of Alberta**, Edmonton, AB, May 2007.
61. Arriaga, E.A. "–Estamos Oxidados–Mitos y Realidades de Oxidantes y Anti-Oxidantes", **Universidad Galileo**, Guatemala City, Guatemala, July, 2007.
62. Arriaga, E.A. "Gigantes en la Célula: Técnicas para Investigar la Mitocondria", **Universidad Francisco Marroquín**, Guatemala City, Guatemala, July, 2007.
63. Arriaga, E.A. "Quantitating Proteomic Changes after Mild Oxidative Stress", Department of Biochemistry, Molecular Biology, and Biophysics, **University of Minnesota—Twin Cities**, July 2007.
64. Arriaga, E.A. "Using Capillary Electrophoresis to Investigate Reactive Oxygen Species Production and Damage", Integrated Biosciences Program, **University of Minnesota—Duluth**, Duluth, MN, November 2007.
65. Arriaga, E.A. "Using Capillary Electrophoresis to Monitor Doxorubicin-Leucin Transformation and Metabolism", University of Minnesota Cancer Center, **University of Minnesota—Twin Cities**, Minneapolis, MN, January 2008.
66. Arriaga, E.A. "What is the Role of Giant Mitochondria in Aging", **2007-2008 Neurology Grand Round Series**, Department of Neurology, **University of Minnesota—Twin cities**, June 2008. (Accepted).
67. Arriaga, E.A. "Uncovering the roles of giant mitochondria in aging", Department of Biochemistry, Molecular Biology and Biophysics, **University of Minnesota—Twin cities**, September 2008. (Accepted).
68. Arriaga, E.A. "Toward directly analyzing solid tissues for capillary electrophoretic analysis" (tentative), **University of Michigan**, Ann Arbor, MI, Oct 2008. (Accepted).
69. Arriaga, E.A. "Electrophoretic separation of Giant Mitochondria" (tentative), **Texas Tech University**, Lubbock, TX, April 2009. (Accepted)

Contributed Presentations

1. Arriaga, E. A.; Valenzano, D. P.; Tarr, M. "Properties of ILeak Produced in Single Frog Cardiac Cells by Rose Bengal Photomodification", 1991 Annual Conference of the American Society of Photobiology (**APS'91**), San Antonio, Texas, 1991.
2. Arriaga, E. A.; Chen, D.; Hager, D.; Cheng, X.; Dovichi, N. J. "Micellar Electrokinetic Capillary Chromatography/Xe-Arc Induced Fluorescence Detection at Subattomole Level of Fluorescein and Fluorescein-

- Labeled Amino Acids", 76th Canadian Society of Chemistry Conference, (**CSC 1993**), Sherbrooke, Québec, 1993.
3. Dovichi, N. J.; Arriaga, E.; Figeys, D. "Separation and Fluorescence Detection of DNA Restriction Fragments by Capillary Electrophoresis", 76th Canadian Society of Chemistry Conference, (**CSC 1993**), Sherbrooke, Québec, 1993.
 4. Banks, P.; Arriaga, E.; Dovichi, N. J. "Capillary Immunofluorometric Assay", 76th Canadian Society of Chemistry Conference, (**CSC 1993**), Sherbrooke, Québec, 1993.
 5. Banks, P.; Arriaga, E. A.; Renborg, A.; Zhang, Y.; Dovichi, N. J. "Enzymatic Assay inside a Capillary for Beta-Galactosidase", Federation of Analytical Chemistry and Spectroscopy Societies, (**FACSS'1994**), St. Louis, Missouri, 1994.
 6. Valenzano, D. P.; Arriaga, E.; Tarr, M. "Cell Membrane Photomodification: Progression of Ion Channel Block", 22nd Annual Meeting of the American Society for Photobiology (**APS'94**), Scottsdale, Arizona, 1994.
 7. Le, X.-C.; Zhang, Y.; Arriaga, E.; Dovichi, N. J.; Hindsgaul, O.; Palcic, M. M. "High Sensitivity Laser Induced Fluorescence Detection in Capillary Electrophoresis for Enzyme Assay", 40th International Conference of Analytical Science Spectroscopy (**ICASS'1994**), Halifax, Nova Scotia, 1994.
 8. Pinto, D. M.; Arriaga, E. A.; Sia, S.; Dovichi, N. J. "Trace Analysis of Peptides by Solid-Phase Labelling and Capillary Electrophoresis with Laser Induced Fluorescence Detection", 77th Canadian Society of Chemistry Conference, (**CSC 1994**), Guelph, Ontario, 1994.
 9. Pinto, D.; Arriaga, E. A.; Sia, S.; Li, Z.; Dovichi, N. J. "Fluorescent Labeling of Toxins on Solid Phase Matrices for Their Ultra-Sensitive Detection by Laser-Induced Fluorescence Capillary Electrophoresis", (Spanish). III **Simposio Centroamericano** y del Caribe de Química Analítica Ambiental y Sanitaria, San Jose, Costa Rica, 1995.
 10. Craig, D.; Arriaga, E.; Banks, P.; Zhang, Y.; Renborg, A.; Palcic, M.M.; Dovichi, N. J. "Enzyme Assay by CE-LIF", 38th annual meeting of the **Canadian Federation of Biological Societies**, Saskatoon, Saskatchewan, Canada, 1995.
 11. Arriaga, E. A.; Lee, I.-H.; Pinto, D.; Ahmadzadeh, H.; Dovichi, N. "On-Column Labelling of Subnanomolar Protein Solutions for Capillary Electrophoresis with Laser-Induced Fluorescence Detection", 10th International Symposium on Capillary Electrophoresis and Isotachopheresis (**ITP'1996**), Prague, Czech Republic, 1996.
 12. Craig, D. B.; Arriaga, E.; Wong, J. C. Y.; Lu, H.; Dovichi, N. J. "Single Enzyme Molecule Assay", 10th **Symposium of the Protein Society**, San Jose, California, 1996.
 13. Ahmadzadeh, H.; Arriaga, E. A.; Sharma, N.; Dovichi, N. J. "Surface Modification of Fused Silica Capillary Walls for Capillary Electrophoresis Using Polymer Coatings Covalently Bonded to the Surface", 7th Annual **Frederick Conference** on Capillary Electrophoresis, Frederick, Maryland, 1996.
 14. Tan, W.; Fischer, K.; Arriaga, E.; Tyrrell, D. L. J.; Dovichi, N. J. "Capillary Electrophoresis-Laser Induced Fluorescence (CE-LIF) Detection of Hepatitis B Virus (HBV) DNA", First **Asia-Pacific International Symposium** on Capillary Electrophoresis and Other Nano- and Micro-scale Analytical Techniques, Singapore, 1996.
 15. Pinto, D. M.; Arriaga, E. A.; Lee, I.-H.; Dovichi, N. J. "The In's and Out's of Capillary Electrophoresis with Laser-Induced Fluorescence Detection for Trace Analysis of Proteins", 43rd International Conference of Analytical Science Spectroscopy (**ICASS'1997**), Montreal, Quebec, 1997.
 16. Zhang, Z.; Arriaga, E.; Krylov, S.; Chan, N.; Dovichi, N. "Analysis of Single Cells and Cell Extracts by Capillary Zone Electrophoresis with Post-Column Laser-Induced Fluorescence Detection", 8th Annual **Frederick Conference** on Capillary Electrophoresis, Frederick, Maryland, 1997.
 17. Krylov, S. N.; Arriaga, E.; Zhang, Z.; Chan, N.; Palcic, M. M.; Dovichi, N. J. "Capillary Electrophoresis for Analysis of Oligosaccharide Metabolism in Single Human Cells". High Performance Capillary Electrophoresis Conference, (**HPCE'98**), Orlando, Florida, 1998.

18. Arriaga, E. A. "Capillary Electrophoresis Separation of Supramolecules: Organelles", Midwest Universities Analytical Chemistry Conference (**MUACC'98**), Wayne State University, Detroit, MI, October, 1998.
19. Krylov, S. N.; Arriaga, E. A.; Zhang, Z.; Palcic, M.; Dovichi, N. J. "Combining Cell Cycle Analysis with Single Cell Analysis Using CE", High Performance Capillary Electrophoresis Conference, (**HPCE'99**), Palm Springs, California, 1999.
20. McLaren, D. G.; Boulat, O.; Arriaga, E. A.; Chen, D. D. Y. "Effects of Salt on the Separation of Amino Acids Analyzed by Capillary Electrophoresis with Laser Induced Fluorescence: Application to the Identification of Inborn Errors of Metabolism", 46th International Conference on Analytical Sciences and Spectroscopy (**46th ICASS**), Winnipeg, Manitoba, Canada, August, 2000.
21. Arriaga, E. A. "Analysis of Organelles by Capillary Electrophoresis with Laser-induced Fluorescence Detection", Midwest Universities Analytical Chemistry Conference (**MUACC' 2000**), Madison, Wisconsin, October, 2000.
22. Duffy, C. F., Gafoor, S.; O'Kennedy, R.; Arriaga, E. A. "Single Liposome Analysis Using Capillary Electrophoresis with Laser-induced Fluorescence Detection", **Pacificchem 2000**, Honolulu, Hawaii, December, 2000.
23. Anderson, A. B.; Arriaga, E. A. "A Method for Detection of Doxorubicin Metabolites by Capillary Electrophoresis with Laser Induced Fluorescence Detection", 84th Canadian Society for Chemistry Conference (**84th CSC**), Montreal, Quebec, Canada, May, 2001.
24. Arriaga, E. A. "Analysis of Organelles by Capillary Electrophoresis with Laser-induced Fluorescence Detection", Midwest Universities Analytical Chemistry Conference (**MUACC' 2001**), Minneapolis, Minnesota, October, 2001.
25. Anderson, A. B.; Ciriacks, C.; Abdalla, A.; Gergen, J.; Arriaga, E. A. "Sub-cellular Localization of Doxorubicin Metabolites by Capillary Electrophoresis with Laser-induced Fluorescence Detection", **Pittcon 2002**, New Orleans, LA, March, 2002.
26. Arriaga, E. A. "Electrophoretic Characterization and Manipulation of Subcellular Environments", **Pittcon 2002**, New Orleans, LA, March, 2002.
27. Arriaga, E. A.; Fuller, K. M. "Analysis of Individual Acidic Organelles by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **Minnesota Chromatography Forum 24th Annual Spring Symposium**, St. Paul, MN, May, 2003.
28. Anderson, A. B.; Arriaga, E. A. "Strategies for Elucidating Doxorubicin Metabolism by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **Minnesota Chromatography Forum 24th Annual Spring Symposium**, St. Paul, MN, May, 2003.
29. Ahmadzadeh, H.; Arriaga, E. A. "Direct Analysis of Individual Mitochondria from Muscle Tissue Cross-Sections", **Minnesota Chromatography Forum 24th Annual Spring Symposium**, St. Paul, MN, May 2003.
30. Hartsel, S.; Arriaga, E. A. "Micellar Electrokinetic Capillary for Analyzing Amphotericin-B in Drug Delivery Formulations", **Minnesota Chromatography Forum 24th Annual Spring Symposium**, St. Paul, MN, May, 2003.
31. Walsh, R.; Arriaga, E.A. "Fluorescent Imaging of Protein 'Sweet Spots' in MALDI-TOF-MS Analysis of Microparticles and Mitochondria", **Pittcon 2004**, Chicago, IL, March, 2004.
32. Xiong, G.; Arriaga, E.A. "Analysis of Doxorubicin Content in Individual Nuclei by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **Pittcon 2004**, Chicago, IL, March, 2004.
33. Whiting, C.; Ahmadzadeh, H.; Arriaga, E.A. "Microfluidic Devices for Organelle Preparation and Analysis", **Pittcon 2004**, Chicago, IL, March 2004.
34. Poe, B.; Arriaga, E.A. "Investigation of Membrane Potential and mtDNA Deletions in Individual Mitochondria", **Pittcon 2004**, Chicago, IL, March 2004.

35. Ahmadzadeh, H.; Dua, R.; Arriaga, E.A. "Automating Individual Particle Analysis by Capillary Electrophoresis", **Pittcon 2004**, Chicago, IL, March, 2004.
36. Poe, B.; Arriaga, E.A. "Towards Defining Heteroplasmy in Single Mitochondria: New Methods and Technology", **Minnesota Chromatography Forum 25th Annual Spring Symposium**, Eden Prairie, MN, May, 2004.
37. Olson, K. J.; Arriaga, E. A. "Single Cell Plasma Membrane Disruption for Organelle Release", Microscale Bioseparations & Methods for Systems Biology Conference, (**MSB 2005**), New Orleans, LA, February 12-17, 2005.
38. Eder, A. R.; Eddy, C. V.; Ahmadzadeh, H.; Arriaga, E. A. "Investigating the Effect of Drug Delivery Systems on the Subcellular Localization of Doxorubicin Metabolites", **Pittcon 2005**, Orlando, FL, March 2005.
39. Poe, B. G.; Navratil, M.; Arriaga, E. A.; "Investigation of the Inner Mitochondrial Membrane Potential in Individual Organelles by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **Pittcon 2005**, Orlando, FL, March 2005.
40. Chen, Y.; Arriaga, E.A. "Subcellular Distribution of Doxorubicin and pH Determination in Individual Acidic Organelles by Capillary Electrophoresis with Laser Induced Fluorescence Detection", **Minnesota Chromatography Forum 26th Annual Spring Symposium**, Minneapolis, MN, May, 2005.
41. Eder, A.; Arriaga, E.A. "Drug Delivery Systems: Effect on the Subcellular Localization of Doxorubicin Metabolites and Generation of Reactive Oxygen", **Minnesota Chromatography Forum 26th Annual Spring Symposium**, Minneapolis, MN, May, 2005.
42. Li, D.; Arriaga, E.A. "Measurement of Superoxide Production from Individual Mitochondria by CE with LIF", **Minnesota Chromatography Forum 26th Annual Spring Symposium**, Minneapolis, MN, May, 2005.
43. Andreyev, D.; Arriaga, E.A. "Simultaneous Light Scattering and Fluorescence Detection of Individual Sub-Micron Particles in CE", **Minnesota Chromatography Forum 26th Annual Spring Symposium**, Minneapolis, MN, May, 2005.
44. Whiting, C.; Arriaga, E.A. "Characterizing Mitochondrial Interactions with the Fused Silica Surface during CE", **Minnesota Chromatography Forum 26th Annual Spring Symposium**, Minneapolis, MN, May, 2005.
45. Eder, A.R.; Arriaga, E.A. "Enhancement of Reactive Oxygen Species Production in Individual Mitochondria upon Treatment with Doxoubicin" **Pacificchem 2005**, Honolulu, HI, December, 2005
46. Andreyev, D.; Arriaga, E.A. "Simultaneous Light Scattering and Fluorescence Detection of Individual Sub-Micron Particles in Capillary Electrophoresis" **Pacificchem 2005**, Honolulu, HI, December, 2005.
47. Arriaga, E.A.; Li, D. "Capillary Electrophoretic Analysis of Individual Organelles Producing Reactive Oxygen Species," Microscale Bioseparations & Methods for Systems Biology Conference, (**MSB 2006**), Amsterdam, The Netherlands, January, 2006.
48. Li, D.; Xie, H.; Thompson, L.; Griffin, T.; Arriaga, E. A. "Identification of Carbonylated Proteins from Enriched Rate Skeletal Muscle Using Affinity Chromatography-Stable Isotope Labeling and Tandem Mass Spectrometry", Oral Session: LC-MS: Bioanalytical Applications II, **Pittcon 2006**, Orlando, FL, March, 2006.
49. Li, D.; Arriaga, E. A. "Superoxide Generation inside the Individual Mitochondrial Matrix by Capillary Electrophoresis with Laser Induced Fluorescence", Oral Session: Capillary Electrophoresis: Detection and Applications, **Pittcon 2006**, Orlando, FL, March, 2006.
50. Andreyev, D.; Arriaga, E.A. "Fabrication of potential novel separation media – perforated silica microshells using colloidal assembly templates", Minnesota Chromatography Forum 27th Annual Spring Symposium (**MCF 2006**), Minneapolis, MN, May, 2006.

51. Arriaga, E.A.; Li, D.; Poe, B.; Navratil, M.; Moraes, C. "Capillary Electrophoretic Analysis of the Superoxide Production by Individual Mitochondria Isolated from Cybrid Cells", **FEBS 2006 Congress**, Istanbul, Turkey, June, 2006.
52. Feng, J.; Arriaga, E.A. "Quantitation of Carbonylated Proteins in Rat Skeletal Muscle Mitochondria Using Capillary Sieving Electrophoresis with Laser-Induced Fluorescence Detection," **Pittcon 2007**, Chicago, IL, February-March 2007.
53. Cressman, E.; Hong, J.; Wang, Y.; Eddy, C.; Arriaga, E.A. "Concentration and Spatial Distribution in Chemoembolized HCC: A New Application of Capillary Electrophoresis Coupled with Laser-Induced Fluorescence", **2007 Society of Interventional Radiology 32nd Annual Meeting**, Seattle, WA, March, 2007.
54. Andreyev, D.; Arriaga, E.A. "Prediction of Peak Overlap Frequency Using Independent Doublets Model", Minnesota Chromatography Forum 28th Annual Spring Symposium, (**MCF 2007**), Minneapolis, MN, May, 2007.
55. Wang, Y.; Arriaga, E.A. "Subcellular Distributions of Leucyl-Doxorubicin Using Micellar Electrokinetic Capillary Chromatography with Laser-Induced Fluorescence Detection", Minnesota Chromatography Forum 28th Annual Spring Symposium, (**MCF 2007**), Minneapolis, MN, May, 2007.
56. Roe, M.R.; Xie, H.; Feng, J.; Meany, D.L. Thompson, L.V.; Arriaga, E.A.; Griffin, T.J. "Towards the Proteomic Mapping of Endogenous Sites of HNE Modification: A Two-Step Solid-Phase Enrichment Strategy for HNE-Modified Peptides," **55th ASMS Conference on Mass Spectrometry and Allied Topics**, Indianapolis, IN, June, 2007.
57. Whiting, C.; Arriaga, E. A. "Analyzing Individual Biological Particles on Microfluidic Devices Using an Orthogonal LIF Detector: Limitations of Microfluidic Analysis Based on Small Sample Sizes", **234th National ACS Meeting**, Boston, MA, August 2007.
58. Katzenmeyer, J.; Arriaga, E.A. "Analysis of the Subcellular Metabolic Profile of Doxorubicin Using HPLC-MS/MS," Oral Session: Bioanalytical Separations I, **Pittcon 2008**, New Orleans, LA, March 2008.
59. Xu, X.; Arriaga, E.A. "Superoxide Production in Mitochondria," Oral Session: Bioanalytical Separations II, **Pittcon 2008**, New Orleans, LA, March 2008.
60. Sa, R.; Zhang, Y.; Carr, P.W.; Arriaga, E.A. "Increasing Sequence Coverage of Integral Membrane Proteins through Transmembrane Peptide Detection", Oral Session: Liquid Chromatography/Mass Spectroscopy: Biological Applications I, **Pittcon 2008**, New Orleans, LA, March 2008.
61. Kostal, V.; Fonslow, B.; Arriaga, E.A.; Bowser, M.T. "Continuous Separation and Fractionation of Mitochondria by Micro Free-Flow Electrophoresis", Oral Session: Particle Separations from Organelles to Organisms, **Pittcon 2008**, New Orleans, LA, March 2008.
62. Kostal, V.; Navratil, M.; Hsu, J.; Arriaga, E.A. "Isolation and Analysis of Mitochondrial Subtypes from Aging Rat Myoblast Cells", Oral Session: Particle Separations from Organelles to Organisms, **Pittcon 2008**, New Orleans, LA, March 2008.
63. Wang, Y.; Cressman, E.; Arriaga, E.A. "Analysis of Doxorubicin and Metabolites by Micellar Electrokinetic Chromatography with Laser-Induced Fluorescence Detection Directly Sampled from Human Liver Tissue Cross-Section", Oral Session: Bionalytical Applications of Capillary Electrophoresis, **Pittcon 2008**, New Orleans, LA, March 2008.
64. Feng, J.; Navratil, M.; Hsu, J.; Kostal, V.; Thompson, L.; Arriaga, E.A. "Age and Muscle Type Influence on Protein Carbonylation in Rat Skeletal Muscle Mitochondria", Oral Session: Biospectroscopy Applications, **Pittcon 2008**, New Orleans, LA, March 2008.
65. Navratil, M.; Kostal, V.; Thompson, L.; Arriaga, E.A. "Characterization of Giant Mitochondria in Rat Myoblasts and Skeletal Muscle", Oral Session: Imaging Cells, **Pittcon 2008**, New Orleans, LA, March 2008.

Contributed Posters

1. Arriaga, E. A.; Best, N.; Zhang, Y.; Dovichi, N. J. "Amino Acid Analysis of Picomole Quantities of Peptides by Laser-Induced Fluorescence Capillary Electrophoresis (LIF-CE)", **46th Annual Summer Symposium on Analytical Chemistry**, Boston, Massachusetts, 1993.
2. Zhang, Z.; Arriaga, E. A.; Tan, W.; Krylov, S.; Le, X. C.; Palcic, M.; Hindsgaul, O.; Dovichi, N. J. "Single Cell Analysis by Capillary Electrophoresis-Laser Induced Fluorescence Detection", 7th Annual **Frederick Conference** on Capillary Electrophoresis, Frederick, Maryland, 1996.
3. Lee, I. -H.; Arriaga, E. A.; Pinto, D.; Ahmadzadeh, H.; Dovichi, N. J. "Subnanomolar Protein Analysis by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", 7th Annual **Frederick Conference** on Capillary Electrophoresis, Frederick, Maryland, 1996.
4. Craig, D. B.; Arriaga, E.; Wong, J. C. Y.; Lu, H.; Dovichi, N. J. "Single Enzyme Molecule Assay", **11th International Conference on Methods in Protein Structure Analysis**, Annecy, France, 1996.
5. LeBlanc, R. J.; LeBlanc, E. L.; Arriaga, E. A.; Chen, Z.; Dovichi, N. J. "Capillary Electrophoresis Laser-Induced Fluorescence Method for Quantitation of Biogenic Amines", High Performance Capillary Electrophoresis, (**HPCE'97**), Anaheim, California, 1997.
6. Chen, Z.; Pinto, D. M.; Stathakis, C.; Arriaga, E. A.; LeBlanc, R. J.; LeBlanc, E. L.; Dovichi, N. J. "Capillary Electrophoresis of Fluorescently Labelled Amines", High Performance Capillary Electrophoresis, (**HPLC'97**), Birmingham, UK, 1997.
7. Qi, M.; Li, X.; Arriaga, E. A.; Dovichi, N. J. "Capillary Electrochromatography Coupled with Laser-induced Thermo-optical Absorbance Detection", **1st International Symposium on Capillary Electrochromatography**, San Francisco, California, 1997.
8. Chan, N. W. C.; Arriaga, E.; Dovichi, N. J.; Srivastava, O. P.; Palcic, M. M. "Capillary Electrophoresis Assay or *In Vivo* Inhibition Of α -glucosidase I", **XIVth International Symposium on Glycoconjugates**, Zurich, Switzerland, 1997.
9. Ocvirk, G.; Andersson, P. E.; Arriaga, E. A.; Harrison, D. J.; Dovichi, N. J. "Lysing of Single Cells and Identification of Their β -galactosidase Activity on a Microchip: An Enzymatic Assay Diagnostics Tool", **Pittcon'98**, New Orleans, LA, 1998.
10. Duffy, C.; Shu, H.; O'Kennedy, R.; Arriaga, E. "Functional Classification of Proteins Using Organelle Analyzers", **16th American Peptide Symposium**, Minneapolis, MN, June 1999.
11. Stephanson, C.; Arriaga, E. A. (Advisor). "Microfabricated Cell Sorter", **219th National ACS Meeting**, San Francisco, CA, March 2000.
12. Strack, A.; Arriaga, E. A. (Advisor). "Mitochondrial Characterization: a Comparison of Classical Assays to Capillary Electrophoresis with Laser-Induced Fluorescence", **219th National ACS Meeting**, San Francisco, CA, March 2000.
13. Wittenberg, N.J.; Arriaga, E. A. (Advisor). "Prototype Microfabricated Device for On-Chip Centrifugal Separations", **219th National ACS Meeting**, San Francisco, CA, March 2000.
14. Anderson, A. B.; Fuller, K.; Gunasekera, N.; Stephanson, C.; Duffy, C.; Wijetunga, M.; Strack, A.; Arriaga, E. A. "Developing Instrumentation and Techniques for Analyzing Doxorubicin in Organelles", 46th International Conference on Analytical Sciences and Spectroscopy (**46th ICASS**), Winnipeg, Manitoba, Canada, August, 2000.
15. Duffy, C.; Gafoor, S.; O'Kennedy, R.; Arriaga, E. A. "Single Liposome Analysis Using Capillary Electrophoresis with Laser-Induced Fluorescence Detection", 46th International Conference on Analytical Sciences and Spectroscopy (**46th ICASS**), Winnipeg, Manitoba, Canada, August 13-16, 2000.
16. Fuller, K.; Duffy, C.; Beissel, F., IV; Wolgamot, M.; Arriaga, E. A. "Lysis of Individual Lysosomes by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", 46th International Conference on Analytical Sciences and Spectroscopy (**46th ICASS**), Winnipeg, Manitoba, Canada, August 13-16, 2000.

17. Gunasekera, N.; Musier-Forsyth, K.; Arriaga, E. A. "Localization of Aminoacyl-tRNA Synthetases Using Capillary Electrophoresis with Laser-Induced Fluorescence Detection [CE-LIF]", 46th International Conference on Analytical Sciences and Spectroscopy (**46th ICASS**), Winnipeg, Manitoba, Canada, August 13-16, 2000.
18. Arriaga, E. A.; Duffy, C. F.; Andreyev, D. "Characterization of Liposome Properties by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", 84th Canadian Society for Chemistry Conference (**CSC 2001**), Montreal, Quebec, Canada, May 2001.
19. Gunasekera, N.; Musier-Forsyth, K; Arriaga, E. "Characterization of Nuclear Preparations by Capillary Electrophoresis with Post-Column Laser-Induced Fluorescence Detection", **12th Frederick Conference** on Capillary Electrophoresis, Frederick, Maryland, October 2001.
20. Anderson, A. B.; Gergen, J.; Arriaga, E. A. "Single-cell Analysis of Doxorubicin Metabolites by Capillary Electrophoresis with Laser-induced Fluorescence Detection", **12th Frederick Conference** on Capillary Electrophoresis, Frederick, Maryland, October 2001.
21. Duffy, C. F.; Fuller, K. M.; Seager, B.; Arriaga, E. A. "Harvesting Individual Particles and Organelles after Capillary Electrophoresis and Detection by Laser-Induced Fluorescence", **LabAutomation 2002**, Palm Springs, CA, January 2002. (*Invited*).
22. Gunasekera, N.; Arriaga, E. A.; Musier-Forsyth, K. "Characterization of Mammalian Nuclei, at the Bulk and the Single Cell Level, by Capillary Electrophoresis with Post-Column Laser-Induced Fluorescence Detection", **Pittcon 2002**, New Orleans, LA, March 2002.
23. Poe, B. G.; Arriaga, E. A. "Novel Procedures for Mitochondrial Protein Separation, Detection and Identification", **Pittcon 2002**, New Orleans, LA, March 2002.
24. Fuller-Reed, K.; Duffy, C.F.; Abdalla, A.; Arriaga E.A. "Analysis of Individual Mitochondria by Capillary Electrophoresis", **Pittcon 2002**, New Orleans, LA, March 2002.
25. Presley, A.D.; Poe, B.G.; Arriaga, E.A. "Separation and Detection of Fluorescently-Labeled Mitochondrial Proteins by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **223rd ACS National Meeting**, Orlando, FL, April, 2002.
26. Ciriacks, C.; Anderson, A.; Arriaga, E.A. "Separation and Detection of Doxorubicin Metabolites in Sub-Cellular Fractions Using Capillary Electrophoresis with Laser-Induced Fluorescence", **223rd ACS National Meeting**, Orlando, FL, April, 2002.
27. Fuller, K.; Duffy, C.; Arriaga, E.A. "Strategies for Individual Mitochondrion Measurements", **Mitochondria and Pathogenesis, Keystone Conference**, Copper Mountain, CO, April 2002.
28. Poe, B.; Walsh, R.; Arriaga, E.A. "Technique for Mitochondrial Protein Isolation, Collection, and Detection by CE/LIF MALDI-TOF-MS", **Systems Biology Approaches to Health Care: Mitochondrial Proteomics**, National Institute of Standards and Technology, Gaithersburg, MD, September 2002.
29. Xiong, G.; Arriaga, E.A. "Electrophoretic Behavior of Mitochondria in Capillary Electrophoresis", **Pittcon 2003**, Orlando, FL, March 2003.
30. Gunasekera, N.; Musier-Forsyth, K.; Arriaga, E.A. "Towards the Capillary Electrophoretic Analysis of Intact Organelles", **Pittcon 2003**, Orlando, FL, March 2003.
31. Nielson, J. A.; Arriaga, E.A.; Anderson, A. "Elucidation of Cellular Doxorubicin Metabolism and Metabolite Structure Using Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **225th ACS National Meeting**, New Orleans, LA, March 2003.
32. Ahmadzadeh, H.; Arriaga, E.A. "Direct Mitochondria Analysis from Rat Muscle Cross-Sections Using Capillary Electrophoresis with Laser-Induced Fluorescence and Sheath-Flow Cuvette Detection", **Design of Medical Devices 2003: Minnesota's Medical Device Community Forum**, Minneapolis, MN, April, 2003.
33. Poe, B.; Arriaga, E.A. "Direct Analysis of Mitochondria by Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry", **Gordon Conference in Analytical Chemistry**, New London, CT, June 2003.

34. Fuller, K.M.; Arriaga, E.A. "Separation and Identification of Individual Mitochondria and Acidic Organelles from a Crude Organelle Fraction by Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **Gordon Conference in Analytical Chemistry**, New London, CT, June 2003.
35. Xiong, G.; Anderson, A.; Arriaga, E.A. "Determination Of Doxorubicin Accumulation In Individual Organelles", **Gordon Conference in Analytical Chemistry**, New London, CT, June 2003.
36. Chen, Y.; Arriaga, E.A. "Subcellular Distribution of Doxorubicin in Individual Acidic Organelles by Capillary Electrophoresis with Laser-induced Fluorescence Detection", **Pittcon 2004**, Chicago, IL, March, 2004.
37. Eder, A.; Arriaga, E.A. "Detection of Liposome-Entrapped Doxorubicin Metabolites using Capillary Electrophoresis with Laser-Induced Fluorescence Detection", **Pittcon 2004**, Chicago, IL, March, 2004.
38. Li, D.; Arriaga, E.A. "Measurement of Superoxide in Individual Mitochondria Using Capillary Electrophoresis with Laser Induced Fluorescence Detection", **Pittcon 2004**, Chicago, IL, March, 2004.
39. Peterson, B.M.; Whiting, C.; Ahmadzadeh, H.; Arriaga, E.A. "Detection of Superoxide Using a Microfluidic Station with Laser-Induced Fluorescence Detection", **229th ACS National Meeting**, San Diego, CA, March, 2005.
40. Feng, J.; Arriaga, E.A. "Effect of Modified Mitochondrial Proteins on the Functions of Aging Muscle", **Medical Alley/MNBO's 4th Annual Health Care & Biosciences Conference and Expo**, St. Paul, MN, October, 2005.
41. Navratil, M.; Arriaga, E.A. "Analysis of Mitochondrial Proteome in Cybrid Cell Lines Bearing Mitochondrial DNA Deletions by Mass Spectrometry", **Pacificchem 2005**, Honolulu, HI, December, 2005.
42. Xie, H.; Li, D.; Thompson, L.V.; Arriaga, E.A.; Griffin, T.J. "Conclusive Determination of Carbonylated Proteins from Rat Skeletal Muscle Mitochondria Using iTRAQ and Tandem Mass Spectrometry", **54th ASMS Conference on Mass Spectrometry**, Seattle, WA, May - June, 2006.
43. Hsu, J.; Arriaga, E.; Feng, J. "Investigating the Mechanisms of Aging: A Longitudinal Study", **2007 Undergraduate Symposium**, University of Minnesota, Minneapolis, MN, April 2007.
44. Arriaga, E.A.; Mann, M.; Forner, F. "Effects of Mild Oxidative Stress on the Proteomes of Differentiated and Non-Differentiated C2C12 Mouse Muscle Cells", **55th ASMS Conference on Mass Spectrometry and Allied Topics**, Indianapolis, IN, June, 2007.
45. Argiros, A.; Navratil, M.; Arriaga, E.A. "Detection of Mismatched Mitochondrial DNA by MutS Using Capillary Electrophoresis", **2007 MRSEC Summer Undergraduate Research Expo**, University of Minnesota, Minneapolis, MN, August 2007.
46. Navratil, M.; Arriaga, E.A. "Giant Mitochondria in Senescent Muscle Cells", **San Antonio Nathan Shock Aging Center Conference on Aging – 2007: Age-Related Muscle Atrophy: Causes & Mechanisms**, Bandera, TX, October 2007.
47. Xu, X.; Arriaga, E.A. "Monitoring Superoxide Release in Rat Skeletal Muscle Mitochondria", **San Antonio Nathan Shock Aging Center Conference on Aging – 2007: Age-Related Muscle Atrophy: Causes & Mechanisms**, Bandera, TX, October 2007.
48. Feng, J.; Xie, H.; Fugere, N.; Snow, L.A.; Griffin, T.J.; Arriaga, E.A. Thompson, L.V. "The role of oxidative stress and skeletal muscle dysfunction with aging", **Bioanalysis and Oxidative Stress – 2008**, London, England, April 2008.
49. Sa, R.; Xu, X.; Wang, Y.; Katzenmeyer, J.; Kostal, V.; Navratil, M.; Arriaga, E.A. "Comprehensive Subcellular Analysis in the Organelle Group", **Engineering Stem Cell Symposium**, Stem Cell Institute, University of Minnesota, Twin Cities, April 2008.
50. Xu, X.; Kostal, V.; Navratil, M.; Arriaga, E.A. "Analysis of Individual Organelles from Single Cells", **Engineering Stem Cell Symposium**, Stem Cell Institute, University of Minnesota, Twin Cities, April 2008.

51. Feng, J.; Xie, H.; Thompson, L.V.; Griffin, T.; Arriaga, E.A. "Quantitating Changes in Protein Carbonylation in Aging Rat Skeletal Muscle", **56th ASMS Conference on Mass Spectrometry and Allied Topics**, Denver, CO, June 2008.
52. Arriaga, E.A.; Navratil, M.; Sa, R.; "Quantification of Proteome Changes in L6 cells Containing Giant Mitochondria", **56th ASMS Conference on Mass Spectrometry and Allied Topics**, Denver, CO, June 2008.
53. Roe, M.R.; Thompson, L.V.; Arriaga, E.A.; Griffin, T.J." A Comprehensive Mass Spectrometry Based Platform Using Hydrazide-Functionalized Reagent for Mapping Sites of Protein Carbonylation", **56th ASMS Conference on Mass Spectrometry and Allied Topics**, Denver, CO, June 2008.

Current Group Members

Visiting Professors:

Prof. Xing-Zheng Wu, Fukui University, Japan, July 2008 -

Postdoctoral and Research Associates:

Dr. Marian Navratil, Ph.D., Slovak University of Technology, April 2004 –

Dr. Vratislav Kostal, Ph.D., Palacky University, Olomouc, Czech Republic, March 2007 –

Graduate Students:

Joe Katzenmeyer, (Analytical), November 2004 –

Rongxiao Sa, (Analytical), October 2004 –

Chad Satori, (Chemical Biology), October 2007 -

Yaohua Wang, (Analytical), October 2004 –

Gregory Wolken, (Analytical), December 2007 –

Xin Xu, (Analytical), October 2004 –

Undergraduate Students:

Mark Chapman, January 2008 -

Craig Foster, September 2007 -

Adriann Hovey, June 2008 -

Past Group Members:

Visiting Professors (4): **David Samuels**, Dept. of Mathematics, University of Newcastle, August-December 2001; **Scott Hartsel**, University of Wisconsin–Eau Claire, September 2002 – August 2003; **Professor David Lewis**, University of Wisconsin–Eau Claire, September 2004 – May 2005; **Gary Mabbott**, University of St. Thomas, St. Paul, MN, Summer 2003, June 2005 – May 2006.

Post-Doctoral and Research Associates (7): Hossein Ahmadzadeh, Dmitry Andreyev (Research Assistant), Ciarán F. Duffy, Chris Eddy, Hongjun Shu, Richard Walsh, Guohua Xiong

Ph.D. and Masters Theses Directed (14): **Adrian Anderson** (Analytical), January 1999 - August 2003; **Dmitry Andreyev** (Interdisciplinary), June 2001 – September 2007; **Scott Brown** (Analytical), January 2004 – August 2005 (M.S.B.); **Yun Chen** (Analytical), December 2002 – December 2006; **Angie Eder** (Analytical), December 2002 – May 2006; **Juan Feng** (Biomedical Engineering), October 2004 – November 2007; **Kathryn Fuller** (Biological), January 1999 - July 2003; **Jennifer Gonerka** (Analytical, M.S.B.), January 2004 – October 2005; **Nilhan Gunasekera** (Interdisciplinary, Co.Advisor: KMF), January 1999 – August 2003; **C.J. Kurth** (M.S.B.); **Danni Li Meany** (Analytical), December 2002- March 2007, **Bobby G. Poe** (Analytical), June 2001 – April 2007; **Chris Whiting** (Analytical), February 2002 – October 2007; **Megan Wolgamot** (M.S.B.).

Other Graduate Students Supervised (7): **Amir Abdalla** (MSERC); **Rajat Dua** (Comp. and Elec. Eng.), August 2001 – May 2003; **Nick Ergang** (Internship); **Aimee Erickson** (Internship); **Rahul Gupta** (Comp. and Elec. Eng.), June 2003 – August 2003; **Bill Sanow**, (Analytical), November 2004 – September 2006; **Lifeng Wang** (Statistics), June 2003 – August 2003.

Graduate Students Currently on Leave (2): **Karen Olson**, (Biomedical Engineering), December 2002 – Fall 2005, On leave Fall 2005 – Fall 2006; **Melanie Fearing**, (Analytical), June 2004 – August 2006, On leave September 2006 – to date, entered Medical School Fall 2006.

Undergraduate Research Assistants (59): Annmarie Argiros (LANDO), Frank J. Beissel, Marylen Challander, Eric Chapman, Jennifer Chen, David Chia, Michael Childe, Chanda Ciriacks (LANDO), Aryel Diker, Sheik Gafoor, Jamie Gergen, Alex Hafner, Jenelle Hagen, Muqbil Hashi, Huda Hassen, Andrew Holm, Jennifer Hong, Michael Horn, Janey Hsu, Ryan Johnson, Ross Jorenby, Aaron Kanter, Uti Kar, Korey Karls, Grace Kim, Nicholas Kim, Sharif Koep, Maisy Liao, Abraham McEathron, Sarah Mattson, Nick Midthune, Steven Mooney, Daniel Murphy, Jessica Nielson (LANDO), Sara Olson, Sana Pasha (MSERC), Britt Peterson (LANDO), Triana

Pham, Robert Poe, Andrew Presley, Jeremy A. Ragan, Alana Reince, Brent Seager, Jean Seidel, Nathan Smith, Vladimir Spasojevic, Cory Stephanson, Angie Strack (LANDO), Nicki Teig, Erik Warg, John W. Thompson, Michele Trach, Suzzane Trach, Lam Tu, Adria Tyndall, Mike Vosberg, Michael Wadsworth, Takia Washington, Melanie Wijetunga (LANDO), Ryan Wilson, Nathan Wittenberg.

Research Assistants: Ryan Johnson (Technician).

Collaborators

Dr. Leo Bonilla, Thermo-Finnigan, 2001-2002

Dr. Michael Bowser, Department of Chemistry, University of Minnesota, Minneapolis, MN, May 2007 -

Dr. Peter W. Carr, Department of Chemistry, University of Minnesota, Minneapolis, Mn, August 2007-

Dr. David Bernlohr, Department of Biochemistry, Molecular Biology and Biophysics, University of Minnesota, Minneapolis, MN, January 2008 -

Dr. Erik Cressman, Department of Radiology, University of Minnesota, Minneapolis, MN, August 2005 –

Dr. Dan Engebretson, Dakota Technologies, Inc. Fargo, ND, March 2003 – December 2003

Dr. Debora Ferrington, Department of Ophthalmology, University of Minnesota, Minneapolis, MN, 2001 – 2005

Dr. Daniel Figeys, Systems Biology Institute, University of Ottawa, Ottawa, Canada, 2007-

Dr. Tim Griffin, Department of Biochemistry, Molecular Biology, and Biophysics, University of Minnesota, Minneapolis, MN, 2004 –

Dr. Wei-Shou Hu, Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, 1998- 2001

Dr. Ron Jemmerson, Academic Health Center, University of Minnesota, Minneapolis, MN, 2003 -

Dr. Nigel Key, Department of Hematology, Medical School, University of Minnesota, Minneapolis, MN, 2002-2005

Dr. David Lewis, University of Wisconsin–Eau Claire, Eau Claire, WI , 2005 - 2006

Dr. Gary Mabbott, University of St. Thomas, St. Paul, MN, 2003 -

Dr. Ed McFalls, Veteran Affairs Hospital, Minneapolis, MN, 2003 –

Dr. Matthias Mann, Proteomics and Signal Transduction, Max-Planck Institut für Biochemie, Martinsried bei München, Germany, October 2005 – 2007

Dr. Carlos Moraes, Medical School, University of Miami, 2001 - 2006

Dr. David C. Muddiman, Mayo Proteomics Research Center, Rochester, MN, 2004 - 2007

Dr. Karin Musier-Forsyth, Department of Chemistry, University of Minnesota, Minneapolis, 1999- 2003

Dr. Stephen Naylor, Biomedical Mass Spectrometry Facility, Mayo Clinic, Rochester, MN, 2000 – 2001

Dr. Bradley Nelson, Department of Mechanical Engineering, University of Minnesota, Minneapolis, 2000 -2002

Dr. David Norris, Department of Materials Science and Chemical Engineering., University of Minnesota, Minneapolis, MN, 2003- 2003

Dr. Richard O’Kennedy, School of Biological Sciences, Dublin City University, Dublin, Ireland, 1998- 1999

Dr. Sally Palm, Department of Laboratory Medicine and Pathology, University of Minnesota, Minneapolis, 1999 –2002

Dr. Rosario Rizzuto, Universidad di Padova, Padova, Italy, 1999-2001

Dr. Shana Sturla, Department of Medicinal Chemistry, University of Minnesota, Minneapolis, MN, May 2008 -

Dr. Alex Termann, Division of Pathology II, Linköping University, Linköping, Sweden, 2006 –

Dr. LaDora Thompson, Department of Physical Medicine and Rehabilitation, University of Minnesota, Minneapolis, MN, 2001 –

Dr. Natalia Tretyakova, Cancer Center, University of Minnesota, Minneapolis, MN, July 2007 -

Dr. Gianluigi Veglia, Department of Chemistry, University of Minnesota, Minneapolis, MN, October 2005 -

Dr. Kendall B Wallace, Department of Biochemistry & Molecular Biology, University of Minnesota School of Medicine, Duluth, MN, 2000 –2002