

Curriculum Vitae

Name: Nancy L. Allbritton

Address: Professor & Chair, Joint Department of Biomedical Engineering
University of North Carolina and North Carolina State University
Chair, UNC Curriculum in Applied Sciences and Engineering

Paul Debreczeny Distinguished Professor, UNC Department of Chemistry
Professor, Department of Pharmacology
Chapman Hall, Rm 241, Campus Box 3216
University of North Carolina
Chapel Hill, NC 27599-3290

Professor, Department of Materials Science & Engineering
4140 Engineering Building III
North Carolina State University
Raleigh, NC 27695-7115

E mail: nlallbri@unc.edu, nlallbri@ncsu.edu

Education:

1979 B.S. Physics, Louisiana State University, Baton Rouge, LA
1985 M.D. Medicine, Johns Hopkins University School of Medicine, Baltimore, MD
1987 Ph.D. Medical Physics/Medical Engineering, Massachusetts Institute of
Technology, Dept. of Health Sciences and Technology, Cambridge, MA

Employment:

1988 - 1989 Postdoctoral Fellow with Dr. Herman Eisen, Center for Cancer Research,
MIT
1989 - 1994 Postdoctoral Fellow with Dr. Lubert Stryer, Dept. of Cell Biology and
Neurobiology, Stanford University
1994 - 2000 Assistant Professor, Dept. of Physiology and Biophysics and Center for
Biomedical Engineering, University of California, Irvine, CA
2000 - 2004 Associate Professor, Dept. of Physiology and Biophysics and Dept. of
Biomedical Engineering, University of California, Irvine, CA
2004 - 2007 Professor, Dept. of Physiology and Biophysics, and Dept. of Biomedical
Engineering, University of California, Irvine, CA
2005 - 2007 Professor, Dept. of Chemistry, and Dept. of Chemical Engineering and
Materials Science, University of California, Irvine, CA
2007 - current Debreczeny Distinguished Professor, Dept. of Chemistry, University of
North Carolina, Chapel Hill, NC
2008 - current Professor, Dept. of Pharmacology, University of North Carolina, Chapel
Hill, NC
2009- current Professor & Chair, Joint Department of Biomedical Engineering,
University of North Carolina, Chapel Hill, NC and North Carolina State

2010- current	University, Raleigh, NC Professor, Department of Materials Science & Engineering, North Carolina State University, Raleigh, NC
2011-current	Chair, Curriculum in Applied Sciences and Engineering, University of North Carolina, Chapel Hill, NC

Awards/Honors:

1982 - 1985	Massachusetts Institute of Technology, Health Sciences and Technology Fellowship
1990 - 1993	NIH Individual Postdoctoral Award
1995	Searle Scholar Award
1995	Beckman Young Investigator Award
2003	UCI Midcareer Research Award
2004	College of Medicine Excellence in Teaching Award
2006	Featured Scientist in Orange County Registrar (3/17/2006), Science Section.
2009	Mary K. and Velmer A. Fassel Award, Dept. of Chemistry, Iowa State University
2010	Fellow, American Institute for Medical & Biological Engineering

Professional Society Membership:

Biophysical Society
American Chemical Society
American Society for Cell Biology
American Association for the Advancement of Science
International Society for Analytical Cytometry

PhD Thesis:

Allbritton, N.L., 1987. "The Role of Calcium in the Destruction of Target Cells by Cytotoxic T Cells" Massachusetts Institute of Technology, pages 1-239.

Publications (refereed):

1. Gupta, P.K., Allbritton, N.L., Erozen, Y.S., and Frost, J.K. 1985. Occurrence of Cilia in Exfoliated Ovarian Carcinoma Cells. *Diag. Cytopath.* 1: 228-231.
2. Allbritton, N.L., Verret, C.R., Wolley, R.C., and Eisen, H.N. 1988. Calcium Ion Concentrations and DNA Fragmentation in Target Cell Destruction by Murine Cloned Cytotoxic T Lymphocytes. *J. Exp. Med.* 167: 514-527.
3. Nagler-Anderson, C., Allbritton, N.L., Verret, C.R., and Eisen, H.N. 1988. A Comparison of the Cytolytic Properties of Murine Primary CD8+ Cytotoxic T Lymphocytes and Cloned Cytotoxic T Cell Lines. *Immunol. Rev.* 103: 111-125.
4. Allbritton, N.L., Nagler-Anderson, C., Elliott, T.J., Verret, C.R., and Eisen, H.N., 1988. Target Cell Lysis by Cytotoxic T Lymphocytes that Lack Detectable Hemolytic Perforin Activity. *J. Immunol.* 141: 3243-3248.
5. Allbritton, N.L., Meyer, T., and Stryer, L. 1992. Range of Messenger Action of Calcium Ion and Inositol 1,4,5-Trisphosphate. *Science.* 258: 1812-1818.
6. Allbritton, N.L., and Meyer, T. 1993. Localized Calcium Spikes and Propagating

Calcium Waves. *Cell Calcium*. 14: 691-697.

7. Boniface, J.J., Allbritton, N.L., Reay, P.A., Kantor, R.M., Stryer, L., and Davis, M.A. 1993. pH Affects the Specificity and Mechanism of Peptide Binding to a Class II Major Histocompatibility Complex Molecule. *Biochemistry*. 32: 11761-11768.

8. Allbritton, N.L., Oancea, E., Kuhn, M., Meyer, T. 1994. Source of Nuclear Calcium Signals. *Proc. Natl. Acad. Sci. U.S.A.* 91: 12458-12462.

9. Shear, J.B., Fishman, H.A., Allbritton, N.L., Garigan, D., Zare, R.N., Scheller, R.H. 1995. Single Cells as Biosensors for Chemical Separations. *Science*. 267: 74-77.

10. Reinhard, E., Yokoe, H., Niebling, K.R., Allbritton, N.L., Kuhn, M., and Meyer, T. 1995. Localized Calcium Signals in Early Zebrafish Development. *Dev. Biol.* 170: 50-61.

11. Boniface, J.J., Lyons, D.S., Wettstein, D.A., Allbritton, N.L., Davis, M.M. 1996. A Conformational Change in a Class II MHC Molecule in the Same pH Range that Effects Antigen Binding. *J. Exp. Med.* 183: 119-126.

12. Fishman, H.A., Orwar, O., Allbritton, N.L., Modi, B.P., Shear, J.B., Scheller, R.H., Zare, R.N. 1996. Cell-to-Cell Scanning in Capillary Electrophoresis. *Anal. Chem.* 68: 1181-1187.

13. Luzzi, V., Lee, C.L., Allbritton, N.L. 1997. Localized Sampling of Cytoplasm from *Xenopus* Oocytes for Capillary Electrophoresis. *Anal. Chem.* 69: 4761-4767.

14. Sims, C.E., Allbritton, N.L. 1998. Metabolism of Inositol 1,4,5-Trisphosphate and Inositol 1,3,4,5-Tetrakisphosphate by the Oocytes of *Xenopus laevis*. *J. Biol. Chem.* 273: 4052-4058.

15. Sims, C.E., Meredith, G., Krasieva, T., Berns, M., Tromberg, B., Allbritton, N.L. 1998. Laser-Micropipet Combination for Single Cell Analysis. *Anal. Chem.* 70: 4570-4577.

16. Luzzi, V., Sims, C.E., Soughayer, J.S., Allbritton, N.L. 1998. The Physiologic Concentration of Inositol 1,4,5-Trisphosphate in the Oocytes of *Xenopus laevis*. *J. Biol. Chem.* 273: 28657-28662.

17. Lee, C.L., Linton, J., Soughayer, J.S., Sims, C.E., Allbritton, N.L. 1999. Localized Measurement of Kinase Activation in Oocytes of *Xenopus laevis*. *Nature Biotech.* 17: 759-762.

18. Luzzi, V., Murtazina, D., Allbritton, N.L. 2000. Characterization of a Biological Detector Cell for Quantitation of Inositol 1,4,5-Trisphosphate. *Anal. Biochem.* 277: 221-227.

19. Meredith, G., Sims, C.E., Soughayer, J.S., Allbritton, N.L. 2000. Measurement of Kinase Activation in Single Mammalian Cells. *Nature Biotech.* 18: 309-312.

20. Soughayer, J.S., Krasieva, T., Jacobson, S.C., Ramsey, J.M., Tromberg, B.J., Allbritton, N.L. 2000. Characterization of Cellular Optoporation with Distance. *Anal. Chem.* 72: 1342-1347.

21. Wu, H., Smyth, J., Luzzi, V., Fukami, K., Takenawa, T., Black, S.L., Allbritton, N.L., Fissore, R.A. 2001. Sperm Factor Induces Intracellular Free Calcium Oscillations by Stimulating the Phosphoinositide Pathway. *Biol. Reprod.* 64: 1338-1349.

22. Li, H., Wu, H.Y., Wang, Y., Sims, C.E., Allbritton, N.L. 2001. Improved Capillary Electrophoresis Conditions for the Separation of Kinase Substrates by the Laser Micropipet System. *J. of Chromat. B.* 757: 79-88.

23. Ren, X., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2001. Electroosmotic Properties of Microfluidic Channels Composed of Poly(dimethylsiloxane). *J. of Chromat. B.* 762: 117-125.

24. Li, H., Sims, C.E., Wu, H., Allbritton, N.L. 2001. Spatial Control of Cellular Measurements with the Laser-Micropipet. *Anal. Chem.* 73: 4625-4631.

25. Hu, S., Ren, X., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2002. Surface

Modification of Poly(dimethylsiloxane) Microfluidic Devices by Ultraviolet Polymer Grafting. *Anal. Chem.* 74: 4117-4123.

26. Wang, Y., Hu, S., Li, H., Allbritton, N.L., Sims, C.E. 2003. Separation of mixtures of acidic and basic peptides at neutral pH. *J. Chromatogr. A.* 1004: 61-70.

27. Han, F., Wang, Y., Sims, C.E., Bachman, M., Chang, R., Li, G.P., Allbritton, N.L. 2003. Fast Electrical Lysis of Cells for Capillary Electrophoresis. *Anal. Chem.* 75: 3688-3696.

28. Sims, C.E., Allbritton, N.L. 2003. Single Cell Kinase Assays: Opening a window onto cell behavior. *Current Opin. Biotech.* 14: 1-6.

29. Hu, S., Ren, X., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2003. Cross-Linked Coatings for Electrophoretic Separations in Poly(dimethylsiloxane) Microchannels. *Electrophoresis.* 24: 3679-3688.

30. McClain, M.A., Culbertson, C.T., Jacobson, S.C., Allbritton, N.L., Sims, C.E., Ramsey, J.M. 2003. Microfluidic Devices for the High Throughput Chemical Analysis of Cells. *Anal. Chem.* 75: 5646-5655.

31. Wagner, J., Fall, C.P., Hong, F., Sims, C.E., Allbritton, N.L., Fontanilla, R.A., Moraru, I.I., Loew, L.M., Nuccitelli, R.A. 2004. A wave of IP₃ production accompanies the fertilization Ca²⁺ wave in the egg of the frog, *Xenopus laevis*: theoretical and experimental support. *Cell Calcium.* 35: 433-447.

32. Li, H. Sims, C.E., Stanbridge, E.J., Allbritton, N.L. 2004. Quantitative Single-Cell Assay for Protein Kinase B Reveals Important Insights into the Biochemical Behavior of an Intracellular Substrate Peptide. *Biochemistry.* 43: 1599-1608.

33. Hu, S., Ren, X., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2004. Surface-Directed, Graft Polymerization within Microfluidic Channels. *Anal. Chem.* 76: 1865-1870.

34. Hu, S., Ren, X., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2004. Tailoring the Surface Properties of Poly(dimethylsiloxane) Microfluidic Devices. *Langmuir.* 20: 5569-5574.

35. Soughayer, J.S., Wang, Y., Li, H., Cheung, S.H., Rossi, F.M., Stanbridge, E.J., Sims, E.S., Allbritton, N.L. 2004. Characterization of TAT-Mediated Transport of Detachable Kinase Substrates. *Biochemistry.* 43: 8528-8540.

36. Meredith, G.D., Wu, H.Y., Allbritton, N.L. 2004. Targeted Protein Functionalization Using His-Tags. *Bioconjugate Chem.* 15: 969-982.

37. Wang, Y., Li, H.H., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2005. Covalent Micropatterning of Poly(dimethylsiloxane) by Photografting Through a Mask. *Anal. Chem.* 77: 7539-7546.

38. Wang, Y., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2006. A Simple Photografting Method to Chemically Modify and Micropattern the Surface of SU-8 Photoresist. *Langmuir* 22: 2719-2725.

39. Wang, Y., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2006. Micropatterning of living cells on a heterogeneously wetted surface. *Langmuir* 22: 8257-8262.

40. Salazar, G., Wang, Y., Young, G., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2007. Micropallet Arrays for the Separation of Single, Adherent Cells. *Anal. Chem.* 79: 682-687.

41. Sims, C.E., Bachman, M., Li, G.P., Allbritton, N.L. 2007. Choosing one from the many: selection and sorting strategies for single adherent cells. *Anal Bioanal. Chem.* 387: 5-8.

42. M Wongela, S.M., Lee, K., Sims, C.E., Allbritton, N.L. 2007. Separation of Fluorescent Phosphatidyl Inositol-Phosphates by Capillary Electrophoresis. *Electrophoresis.* 28: 1235-42.

43. Wang, Y., Young, G., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2007. Collection and Expansion of Single Cells and Colonies Released from a Micropallet Array.

Anal. Chem. 79: 2359-66.

44. Sims, C.E., Allbritton, N.L. 2007. Analysis of Single Mammalian Cells On-Chip. *Lab on Chip*. 7: 423-440.

45. Hellman, A.N., Rau, K.R., Yoon, H.H., Bae, S., Palmer, J.F., Phillips, K.S., Bachman, M., Allbritton, N.L., Venugopalan, V. 2007. Fast Laser-Induced Mixing in Microfluidic Channels. *Anal. Chem.* 79: 4484-4492.

46. Wang, Y., Young, G., Aoto, P.C., Pai, J.H., Bachman, M., Li, G.P., Sims, C.E., Allbritton, N.L. 2007. Broadening Cell Selection Criteria with Micropallet Arrays of Adherent Cells. *Cytometry*. 71A: 866-874.

47. Wang, Y., Pai, J.P., Lai, H.H., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2007. Surface Graft Polymerization of SU-8 for Bio-MEMS Applications. *J. Micromech Microeng.* 17: 1371-1380.

48. Wang, Y., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2007. Stability of Virtual Air Walls on Micropallet Arrays. *Anal. Chem.* 79: 7104-7109.

49. Pai, J.P., Wang, Y., Salazar, G., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2007. A Photoresist with Low Fluorescence for Bioanalytical Applications. *Anal. Chem.* 79: 8774-80. PMID: PMC2435225

50. Fernandes, F., Bailey, D.E., VanVranken, D.L., Allbritton, N.L. 2007. The Use of Docking Peptides to Design Modular Substrates with High Efficiency for the MAP Kinase ERK. *ACS Chem. Bio.* 2: 665-673. PMID: PMC2597387

51. Marc, P.J., Sims, C.E. Allbritton, N.L. 2007. Coaxial-Flow System for Chemical Cytometry. *Anal. Chem.* 79: 9054-9. PMID: PMC2435506

52. Nelson, A.R., Borland, L., Allbritton, N.L., Sims, C.E. 2007. Myristoyl-Based Transport of Peptides into Living Cells. *Biochemistry* 46: 14771-81. PMID: PMC2408932

53. Quinto-Su, P.A., Lai, H.H., Yoon, H.H., Sims, C.E., Allbritton, N.L., Venugopalan, V. 2008. Examination of laser microbeam cell lysis in a PDMS microfluidic channel using time-resolved imaging. *Lab Chip*. 8: 408-414. PMID: PMC2525503

54. Lee, K., M Wongela, S.M., Borland L.M., Nelson, A.R., Sims, C.E., Allbritton, N.L. 2008. Determination of Sphingosine Kinase Activity for Cellular Signaling Studies. *Anal. Chem.* 80: 1620-1627. PMID: PMC2853780

55. Marc, P.J., Sims, C.E., Bachman, M., Li, G.P., Allbritton, N.L. 2008. Fast-Lysis Cell Traps for Chemical Cytometry. *Lab Chip*. 8: 710-716. PMID: PMC2605510

56. Wang, Y., Salazar, G., Pai, J.P., Shadpour, H., Sims, C.E., Allbritton, N.L. 2008. Micropallet arrays with poly(ethylene glycol) walls. *Lab Chip*. 8: 734-740. PMID: PMC2596887

57. Borland, L.M., Kottegoda, S., Phillips, K.S., Allbritton, N. L. 2008. Chemical Analysis of Single Cells. *Ann. Rev. Anal. Chem.* 1:191-227.

58. Quinto-Su, P.A., Salazar, G.T., Sims, C.E., Allbritton, N.L., Venugopalan, V. 2008. Mechanism of Pulsed Laser Microbeam Release of SU-8 Polymer Micropallets for the Collection and Separation of Adherent Cells. *Anal. Chem.* 80: 4675-4679. PMID: PMC2525502

59. Kottegoda, S., Aoto, P.C., Sims, C.E., Allbritton, N.L. 2008. The Biarsenical-Tetracysteine Motif as a Fluorescent Tag for Detection in Capillary Electrophoresis. *Anal. Chem.* 80: 5358-5366. PMID: PMC2562765

60. Salazar, G., Wang, Y., Bachman, M., Sims, C.E., Li, G.P., Allbritton, N.L. 2008. Characterization of the Laser-Based Release of Micropallets from Arrays. *J. Biomed. Optics*.

13(03): 034007. DOI: 10.1117/12.805537. PMCID: PMC2536741

61. Lai, Z., Wang, Y., Allbritton, N.L., Li, G.P., Bachman, M. 2008. A Label-Free Biosensor by Protein Grating Coupler On Planar Optical Waveguide. *Optics Lett.* 33:1735-7.

62. Lai, H.H., Quinto-Su, P.A., Sim, C.E., Bachman, M., Li, G.P., Venugopalan, V., Allbritton, N.L. 2008. Characterization and utilization of laser-based lysis for cell analysis on-chip. *J. Royal Soc. Interface.* 5:S113-S121. PMCID: PMC2706033

63. Borland, L.M., Allbritton, N.L. 2008. Use of micellar electrokinetic chromatography to measure palmitoylation of a peptide. *J. Chromat. B.* 875:451-458. PMCID: PMC2593098

64. Phillips, K.S., Kottegoda, S., Kang, K.M., Sims, C.E., Allbritton, N.L. 2008. Separations in poly(dimethylsiloxane) microchips coated with supported bilayer membranes. *Anal. Chem.* 80:9756-9762. PMCID: PMC2735572

65. Shadpour, H., Sims, C.E., Thresher, R.J., Allbritton, N.L. 2009. Sorting and Expansion of Murine Embryonic Stem Cell Colonies using Micropallet Arrays. *Cytometry A.* 75A:130-139. PMCID: PMC2666102

66. Shadpour, H., Sims, C.E., Allbritton, N.L. 2009. Enrichment and expansion of cells using antibody-coated micropallet arrays. *Cytometry A.* 75A:609-618. PMCID: PMC2753796

67. Fernandes, F., Allbritton, N.L. 2009. Effect of the DEF motif on efficiency and specificity of phosphorylation of peptide substrates of ERK. *Biochem. Biophys. Res. Com.* 387:414-418. PMCID: PMC2745210

68. Phillips, K.S., Kang, K.M., Licata, L., Allbritton, N.L. 2010. Air-Stable Supported Membranes for Single Cell Cytometry on PDMS Microchips. *Lab Chip.* 10:864-870. PMCID: PMC2992470

69. Xu, W., Sims, C.E., Allbritton, N.L. 2010. Microcup Arrays for the Efficient Isolation and Cloning of Adherent Cells. *Anal. Chem.* 82:3161-3167. PMCID: PMC2854869

70. Shadpour, H., Allbritton, N.L. 2010. In-Situ Roughening of Polymeric Microstructures. 2010. *ACS Applied Materials & Interfaces.* 2:1086-1093. PMCID: PMC2861798

71. Wang, Y., Dhopeswarkar, R., Najdi, R., Waterman, M., Sims, C.E., Allbritton, N.L. 2010. Microdevice to Capture Colon Crypts for in vitro Studies. *Lab Chip.* 10:1596-1603. PMCID: PMC2992468

72. Xu, W., Luikart, A.M., Sims, C.E., Allbritton, N.L. 2010. Contact Printing of Arrayed Microstructures. *Anal Bioanal. Chem.* 397:3377-3385. PMCID: PMC2912404

73. Jiang, D., Sims, C.E., Allbritton, N.L. 2010. Microelectrophoresis Platform for Fast Serial Analysis of Single Cells. *Electrophoresis.* 31:2558-2565. PMCID: PMC2993077

74. Gach, P.C., Sims, C.E., Allbritton, N.L. 2010. Transparent Magnetic Photoresists for Bioanalytical Applications. *Biomaterials.* 31:8810-8817. PMCID: PMC2949478

75. Wang, Y., Phillips, P., Pai, J.H., Xu, W., Sims, C.E., Allbritton, N.L. 2010. Micromolded Arrays for Separation of Adherent Cells. *Lab Chip.* 10:2917-2124. PMCID: PMC2994190

76. Pai, J.H., Xu, W., Sims, C.E., Allbritton, N.L. 2010. Microtable Arrays for Culture and Isolation of Cell Colonies. *Anal. Bioanal. Chem.* 398:2595-2604. PMCID: PMC2996274

77. Jiang, D., Sims, C.E., Allbritton, N.L. 2011. Single-Cell Analysis of Phosphoinositide 3-Kinase (PI3K) and Phosphatase and Tensin Homolog (PTEN) Activation. *Faraday Discussions.* 149:187-200. PMCID: PMC3017462

78. Xu, W., Herman, A., Phillips, C., Pai, J.H., Sims, C.E., Allbritton, N.L. 2011. Selection and separation of viable cells based on a cell-lethal assay. *Anal. Chem.* 83:278-283. PMCID: PMC3012145

79. Kovarik, M.L., Allbritton N.L., 2011. Measuring enzyme activity in single cells. *Trends Biotech.* 29:222-230. [PMC journal - in process]

80. Phillips, K.S., Lai, H.H., Johnson, E., Sims, C.E., Allbritton, N.L. 2011. Continuous chemical analysis of single cells on a microfluidic chip. *Lab Chip.* 11:1333-1341. [PMC journal - in process]

81. Shadpour, H., Zawistowski, J.S., Hermana, A., Hahn, K., Allbritton, N.L. 2011. Patterning micropallet arrays for cell selection based on high-resolution measurements of fluorescent biosensors. *Analytica Chimica Acta.* In press.

82. Lai, H.H. , Xu, W., Allbritton, N.L. 2011. Use of virtual air walls in PDMS microfluidic devices for bioanalytical applications. *Biomicrofluidics.* In Press.

83. Gach, P.C., Wang, Y., Phillips, C., Sims, C.E., Allbritton, N.L. 2011. Isolation and Manipulation of Living Adherent Cells by Micromolded Magnetic Rafts. *Biomicrofluidics.* In Press.

84. Wang, Y., Balowski, J., Phillips, C., Phillips, R., Sims, C.E., Allbritton, N.L. Benchtop Micromolding of Polystyrene by Soft Lithography. *Lab Chip.* In Press.

Publications (not refereed):

85. Meyer, T., Allbritton, N.L., Oancea, E. 1995. Regulation of Nuclear Calcium Concentration. *Ciba Foundation Symposium.* 188: 252-262.

86. Jensen-McMullin, C.; Ng, S.; Bachman, M.; Sims, C.; Allbritton, N.; Li, G.P. 2005. A microfluidic assembly line for adherent cell assays. *Microtechnology in Medicine and Biology*, 2005. 3rd IEEE/EMBS Special Topic Conference, May 12-15, Page:34-37.

87. Sims, C.E., Luzzi, V., Allbritton, N.L. 2005. Localized sampling, electrophoresis and biosensor analysis of *Xenopus laevis* cytoplasm for subcellular biochemical assays. *Meth. Molec. Biol.* 322: 413-424.

88. Lai, Z., Wang, Y.L., Sims, C.E., Allbritton, N., Bachman, M., Li, G.P. 2007. A label-free integrated optics biosensor by diffraction grating coupler. *Frontiers in Biomedical Devices Conference*, Ju 07-08, 2007, Proceedings of the 2nd Frontiers in Biomedical Devices Conference pages 67-68.

89. Ricks-Nelson, A., Sims, C.E., Allbritton, N.L. 2007. Rapid sampling for single-cell analysis by capillary electrophoresis. *Meth. Cell Biol.* 82: 709-722.

90. Sims, C.E., Allbritton, N.L. 2008. Microfabricated Devices for Cell Sorting in Biological Applications of Microfluidics. Gomez, F. (ed.) Wiley. Ch. 3, pp. 29-64.

91. Proctor, A., Yang, S., Kottegoda, S., Brenner, M., Phillips, R. M., Sims, C.E., Allbritton, N.L. 2010. Cell Signaling Studied at the Single Cell Level. In "Chemical Cytometry: Ultrasensitive analysis of single cells", Ed. C. Lu, Wiley-VCH. New York. p31-54.

Patents

Issued Patents:

1. Kuhn, M., Meyer, T., and Allbritton, N.L. Bifunctional Chelating Polysaccharides. U.S. Patent # 5,773,227.

2. Allbritton; N.L., Sims, C.E., Berns, M.W., Meredith, G.D., Krasieva, T.B., Tromberg, B.J. Fast controllable laser lysis of cells for analysis. U.S. Patent # 6,156,576.

3. Allbritton; N.L., Sims, C.E., Berns, M.W., Meredith, G.D., Krasieva, T.B., Tromberg, B.J. Method and apparatus for detecting enzymatic activity using molecules that change electrophoretic mobility. U.S. Patent # 6,335,201.

4. Allbritton, N.L., Sims, C.E. Method and apparatus for detecting cancerous cells using molecules that change electrophoretic mobility. U.S. Patent # 6,740,497.

5. Allbritton; N.L., Sims, C.E., Berns, M.W., Meredith, G.D., Krasieva, T.B., Tromberg, B.J. Method and apparatus for detecting enzymatic activity using molecules that change electrophoretic mobility. (CIP to 6,335,201) U.S. Patent # 7,157,223.

6. Allbritton, N.L., Sims, C.E. Method to measure the activation state of signaling pathways in cells. U.S. Patent # 7,236,888.

7. Bachman, M., Li, G.P., Allbritton, N., Sims, C. Micropatterned plate with micro-pallets for addressable biochemical analysis. U.S. Patent # 7,695,954.

8. Allbritton, N., Sims, C., Wang, Y., Bachman, M., Li, G.P., Stanbridge, E.J. Systems and methods for efficient collection of single cells and colonies of cells and fast generation of stable transfectants. U.S. Patent # 7,759,119.

Pending Patent Applications:

9. Li, G.P., Bachman, M., Allbritton, N., Sims, C., Jensen-McMullen. Automated, programmable, high throughput, multiplexed assay system for cellular and biological assays. Patent Pending.

10. Wang, Y., Bachman, M., Sims, C., Li, G.P., Allbritton, N.L. A micro-bubble plate for patterning biological and non-biological materials. Patent Pending.

11. Bachman, M., Li, G.P., Allbritton, N., Sims, C. Micropatterned plate with micro-pallets for addressable biochemical analysis. Patent Pending.

12. Bachman, M., Wang, Y., Sims, C., Allbritton, N., Li, G.P. Method of manufacture of a plate of releasable elements and its assembly into a cassette. Patent Pending.

13. Allbritton, N., Sims, C., Wang, Y., Bachman, M., Li, G.P. Efficient collection of single cells and colonies of cells from arrays. Patent Pending.

14. Allbritton, N., Sims, C., Shadpour, H., Xu, W. Systems and Methods for Isolating Cells in Cell Colonies in Culture, PCT/US2009/067482.

15. Allbritton, N., Sims, C., Xu, W. Methods and Device for Cell Selection and Collection in an Isolated Culturing Environment, PCT/US2010/023854.

16. Allbritton, N., Sims, C., Wang, Y. Array of Micromolded Structures for Sorting Adherent Cells, provisional patent application #61305067.

Invited Presentations- Educational Institutions/Companies:

1996 Seminar, Oakridge National Laboratory, Oakridge, TN

1997 Seminar, California State University, Fullerton, CA

1998 UCI Cancer Center Retreat, Palm Springs, CA

Board of Advisors, Beckman Laser Institute

1999 Department of Physiology, Univ. of Texas, San Antonio

Department of Chemistry, Univ. of Texas, Austin

Department of Biological Chemistry, UCI

Beckman-Coulter Instruments, Fullerton, CA

Cytovia, San Diego, CA

Smith-Kline-Beecham, King of Prussia, PA

2000 Department of Chemistry, University of Wisconsin, Madison

LAMMP External Advisory Board, Beckman Laser Institute, UCI

- Beckman Laser Institute Board Meeting, UCI
Eos Biotechnology, South San Francisco, CA
Rigel, South San Francisco, CA
Roche Bioscience, Palo Alto, CA
Roche Discovery Technologies, Nutley, NJ
Eli Lilly, Indianapolis, IN
Glaxo-Wellcome, Research Triangle Park, NC
Schering-Plough, Kenilworth, NJ
Johnson and Johnson, Raritan, NJ
- 2001 Department of Chemistry, University of Kansas, Lawrence
Department of Chemistry, University of California, Riverside
Myriad Genetics, Salt Lake City, UT
Signal Pharmaceuticals, San Diego, CA
Applied Biosystems, Foster City, CA
Dynavax, Berkeley, CA
- 2002 Dept. of Molecular Biology and Biochemistry, UCI
Cancer Center Seminar Series on Growth Factors and Signaling, UCI
- 2003 Medical College of Wisconsin, Milwaukee, WI
Dept. of Biological Chemistry, UCI
Dept. of Chemistry, University of Pittsburgh, PA
Novartis, San Diego, CA
- 2004 Department of Biomedical Engineering, UCSD, San Diego, CA
IGB Systems Biology Forum, UCI, Irvine, CA
- 2005 Department of Chemistry, Louisiana State University, Baton Rouge, LA
Cancer Center, Washington University, Saint Louis, MO
Dept. of Chemistry, UCI
Pharmaceutical Sciences, University of Wisconsin, Madison, WI
Program in Nanotechnology, University of Washington, Seattle, WA
- 2006 Proteomics Interest Group, NIH, Bethesda, MD
Dept. of Chemistry, University of Pittsburgh, Pittsburgh, PA
Dept. of Chemistry, California State University, Los Angeles, CA
Dept. of Chemistry, University of North Carolina, Chapel Hill
- 2007 Dept. of Chemistry, Santa Clara University, Santa Clara, CA
Dept. of Physical Chemistry and Microtechnology, Chalmers University of
Technology, Gothenberg, Sweden
Center for LifeChips IGERT Seminar, University of California, Irvine, CA
Dept. of Pharmacology, , University of North Carolina, Chapel Hill, NC
Dept. of Pathology Grand Rounds, University of North Carolina, Chapel Hill, NC
Lineberger Cancer Center, University of North Carolina, Chapel Hill, NC
- 2008 Dept. of Chemistry, University of Minnesota, Minneapolis, MN
Carolina Center of Cancer Nanotechnology Excellence, University of North
Carolina, Chapel Hill, NC
Dept. of Chemistry, University of Florida, Gainesville, FL
- 2009 Dept. of Chemistry, Michigan State University, Lansing , MI
Mary K. and Velmer A. Fassel Lecture, Dept. of Chemistry, Iowa State
University, Ames, IW

- 2010 Dept. of Biomedical Engineering, NCState-UNC
Dept. of Chemistry, Indiana University, Bloomington, IN
Dept. of Chemistry, Northeastern University, Boston, MA
Dept. of Cell and Developmental Biology, UNC
Agilent, Santa Clara, CA
Dept. of Chemical and Biomolecular Engineering, NCSU
School of Pharmacy, Molecular Therapeutics Division, UNC
Peking University, Beijing, China
China Agricultural University, Beijing, China
Institute for Chemistry, Chinese Academy of Science, Beijing, China
Dept of Biomedical Engineering, Duke University
Dept. of Pathology, UNC
Raleigh Engineering Club, Raleigh, NC
- 2011 MD, PhD Seminar Series, University of North Carolina, Chapel Hill, NC
Department of Biomedical Engineering, University of Virginia, Charlottesville
Center for Bio/Molecular Science and Engineering, Naval Research Lab,
Washington DC
HHMI Translational Medicine Training Program, Chapel Hill, NC
Department of Chemistry and Biochemistry, University of Arizona, Tucson
Dept. of Chemistry, University of California, Riverside, CA
Dept. of Chemistry, University of Illinois at Urbana-Champaign, Urbana, IL
Dept. of Chemistry, University of Texas, Austin, TX

Invited Presentations- Professional Meetings:

- 1993 Calcium Signaling, Gordon Conference, Henniker, NH
Workshop: Nonlinear Mechanisms in Calcium Oscillations and Waves, Tamales Bay, CA
- 1994 Calcium and Cell Function, FASEB Conference, Saxtons River Vermont
- 1997 Workshop of the Mechanisms of the Fertilization Calcium Wave, Institute for Theoretical Dynamics, Fallen Leaf Lake, CA
- 1998 Workshop on Calcium Dynamics in Cells, Institute for Mathematics and Its Applications, Minneapolis, MN
- 1999 12th International Symposium on High Performance Electrophoresis and Related Microscale Techniques, Palm Springs, CA
Calcium Signalling, Gordon Conference, Heniker, NH
Analytical Chemistry, Gordon Conference, Heniker, NH
Frederick Conference of Capillary Electrophoresis, Frederick, MD
- 2000 American Chemical Society National Meeting, San Francisco, CA
Assay Development, San Diego, CA
Optical Society, Miami, FL
- 2001 ARBF Annual Meeting, San Diego, CA
High Throughput Screening, San Diego, CA
National Cancer Institute Innovative Technologies, Washington DC
NIST Advanced Technology Program, Washington DC
Federation of Analytical Chemists, Detroit, MI

- 2002 BiOMEMS and Biomedical Nanotechnology, Columbus, OH
UCI Engineering Symposium, Beckman National Academy of Sciences
Protein Phosphorylation and Mechanisms of Cellular Regulation, Keystone
Symposium, Taos, NM
Calcium and Cell Function, FASEB Meeting, Salt Lake City, Utah
26th International symposium on High Performance Liquid Phase Separations &
Related Technologies, Montreal, Quebec, Montreal, Quebec
- 2003 UCI Nanofabrication Symposium, Beckman National Academy of Science
Pittcon, Orlando, FL
Symposium on "Merging Chemistry and Biology: Perspectives, Progress, and
Innovations", University of Minnesota, Minneapolis, MN
26th International Symposium on Capillary Chromatography and Electrophoresis,
Las Vegas, NV
SmallTalk Microfluidics Meeting, San Jose, CA
6th International Symposium on Mass Spectrometry, San Francisco, CA
Assays and Cellular Targets Meeting, Boston, MA
Society of Analytical Chemists of Pennsylvania Meeting, Pittsburgh, PA
- 2004 "Analyzing the Single Cell", American Association for Cancer Research Annual
Meeting, Orlando, FL
American Chemical Society National Meeting, Anaheim, CA
Nanotechnologies in Biology, American Society of Mechanical Engineers, Irvine,
CA
Federation of Analytical Chemistry and Spectroscopy Societies, Portland, OR
XXII Congress of the International Society for Analytical Cytology, Montpellier,
France
NCI Innovative Molecular Analysis Technologies, San Diego, CA
UC Systemwide Bioengineering Symposium, Irvine, CA
- 2005 18th International Symposium on MicroScale Bioseparations, New Orleans, LA
American Society for Pharmacology and Experimental Therapeutics, San Diego
IEEE-MBS Conference on Microtechnologies, Honolulu, HA
"Methods to Analyze Cellular Processes" Pacificchem, Honolulu, HA
- 2006 "Biosensors", American Chemical Society Western Regional Meeting, Anaheim
Gordon Conference on Biosensors, Ventura, CA
"Unraveling the Secrets of the Brain with More Sensitive and Smaller Analytical
Techniques", Pittcon2006, Orlando, FL
"Harnessing the power of biology: Utilizing biological signaling for chemical
analysis", Pittcon2006, Orlando, FL
"International Symposium on LifeChips", National Academy of Sciences, Irvine
Symposium on Perspectives on Chemistry Research (PERCRUM), University of
Michigan, Ann Arbor, MI
"Interfacing Biology with Lab-on-a-Chip Devices", National Meeting of the
American Chemical Society, Sept., San Francisco, CA
"Partnership & Commercialization of Next-Generation High-Content Biomedical
Systems", Sino-American Biotechnology and Pharmaceutical Association,
Irvine
"Chips to Hits" Meeting, Sept., Boston, MA

- 2007 “Microanalytical Techniques: A Perspective on the Added Benefit of Better Detection and More Efficient Separations”, LabAutomation2007, Palm Springs, CA
- 2008 “Exploring Single Cells with Microanalytical Tools”, Pittcon2007, Chicago, IL
4th International Conference on “Analysis of Microbial Cells at the Single Cell Level”, Dresden, Germany
“Single Cell Analysis”, Pittcon2008, New Orleans, LA
“Microfluidic Systems for Cellular Assays”, Pittcon2008, New Orleans, LA
"32nd International Symposium on Capillary Chromatography", Riva Del Garda, Italy
Bioanalytical-Cellular Analysis Symposium, FACSS 2008, Reno, NV
Seventh Annual AACR Conference on Frontiers in Cancer Prevention Research, Washington DC
- 2009 "Analytical Diagnostics of Disease from Cellular Signals" Pittcon2009, Chicago, IL
"Cellular and Sub-Cellular Separations" Pittcon2009, Chicago, IL
Materials Research Society Annual Meeting, Raleigh, NC
- 2010 Keynote Speaker, "Micro- and nanofluidics for cell biology", Leiden, Netherlands
Pittcon2010, Symposium in Separation Science, Orlando, FL
Gordon Research Conference on "Bioanalytical Sensors", New London, NH
Faraday Discussions of the Royal Society of Chemistry, Analysis for Healthcare Diagnostics and Theranostics, Edinburgh, Scotland
Pacifichem 2010, "Microfluidic and Nanofluidic Devices for Chemical and Biochemical Experimentation", Honolulu, HA
- 2011 North Carolina Society of Engineers, Southern Pines, NC
U.S. Human Proteome Organization, Raleigh, NC
"Interfaces Between Cells and the Outside World: Bioengineering Meets Biophysics", Biophysical Society 55th Annual Meeting, Baltimore
"Nano and Microfluidic Systems in Bioanalysis", Pittcon 2011, Atlanta
"Physics and chemistry of microfluidics" Gordon Research Conference, Waterville Valley, NH
International Society of Analytical Cytometry, XXVI International Congress, Baltimore, Md
NanoBiotech, Montreux, Switzerland
"Cellular Systems Biology" Gordon Research Conference, Davidson, NC

Corporate Activities:

Scientific Founder of CellBiosciences, Palo Alto, CA, Feb. 2003

Consulting Scientist, CellBiosciences, Palo Alto, CA, 2/2003-2/2008

Scientific Founder of Intellego, Irvine, CA Feb. 2009.

Scientific Founder of Cell Microsystems, Chapel Hill, NC, Sept. 2010.

Editorial

2004-2005 A-Page Advisory Panel for “Analytical Chemistry”

National Committees

Allbritton, Nancy L.

2010-2013: National Councilor Member, Biophysical Society
2011-2013: Society Programs Committee, Biophysical Society