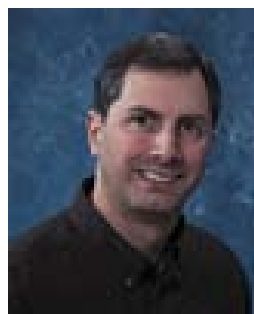


Mitchel J. Doktycz

Distinguished Scientist
Biosciences Division
Center for Nanophase Materials Sciences
Oak Ridge National Laboratory
(865) 574-6204
doktycmj@ornl.gov



Education

University of Illinois	Biology and Chemistry	B.S., 1985
University of Illinois	Chemistry	M.S., 1987
University of Illinois	Chemistry	Ph.D., 1991

Professional Experience

2011–Present	Inaugural Faculty, UT-ORNL Center for Interdisciplinary Research and Graduate Education
2006–Present	R&D Staff, Center for Nanophase Materials Sciences, ORNL
2005–Present	Distinguished Scientist and Leader, Biological and Nanoscale Systems Group
2002–2005	Research Staff, Condensed Matter Sciences Division, ORNL
2001–2005	Program Leader, Biomedical & Biophysics Programs, ORNL
1995–Present	Adjunct Assistant Professor, Graduate Program in Genome Science and Technology, University of Tennessee–Knoxville.
1994–Present	Research Staff, Biosciences Division, ORNL
1991–1994	Postdoctoral Fellow, Biology Division, ORNL

Professional and Synergistic Activities

1992–Present	Member: American Association for the Advancement of Science and American Chemical Society
--------------	---

Honors and Awards:

2008	Fellow of the American Institute for Medical and Biological Engineering 1987 Merit Award for Outstanding Teaching in Chemistry, University of Illinois
2004	Life Sciences Division Award for Scientific Achievement
2003	National Federal Laboratory Consortium Award for Excellence in Technology Transfer
2002	R&D 100 Award
2001	SE Region Federal Laboratory Consortium Award for Excellence in Technology Transfer
1997	Lockheed Martin Energy Research Publication Award
1990	Bernard Babler Award for Excellence in Teaching, University of Illinois

Publications

Full publication list follows CV.

Research Synopsis

M. J. Doktycz's research interests focus at the intersection of biological and nanoscale systems. His laboratory is involved in the development of analytical technologies for post-genomics studies with specific emphases on molecular and cellular imaging techniques and the use of nanomaterials to study and mimic biological systems.

1. *Cell Mimics* – Biological systems present the ideal paradigm for technologies that require the integration of multiple functions. In these efforts, advances in micro- and nanoscale fabrication are being exploited to build functional mimics of biological cells. These mimics replicate the volume and controlled material exchange that are characteristic of natural cells. Synthetic gene networks are encapsulated within these structures with the ultimate goal of realizing practical devices for industrial and biomedical applications.
2. *Biomineralization* – Biological systems are remarkable in their ability to produce inorganic materials with desired physical properties. Efforts are focused on understanding biological routes to mineralization as well as on the development of bioinspired approaches to nanomaterial fabrication. Micro- and nanoscale chemical patterning techniques are used to control the chemical and physical characteristics of mineralization interfaces. Objectives of these efforts are to gain insights into natural routes to mineralization and to realize practical applications of biomineralization technologies.
3. *Molecular and Cellular Imaging* – Advanced imaging techniques are being combined with surface modifications, microfluidics control, and electronic interfaces to create effective platforms for studying living systems. One key focus is the development of scanning probe microscopy based techniques to gain information about biological cells at the molecular and cellular levels.
4. *Genomics Science* – The advent of whole genome sequencing is revolutionizing our understanding of biological systems. A specific focus of our genomics science efforts is to characterize and interpret the dynamic interface that exists between plants, microbes, and their environment and to relate these functional events to genetic characteristics.

Graduate and Postdoctoral Advisors:

Graduate Advisor: A. S. Benight, Portland State University
Postdoctoral Advisor: K. B. Jacobson, ORNL (Retired)

Thesis Advisor and Postgraduate-Scholar Sponsor:

Current Students: S. Iyer, C. Chin

Current Postdoctoral: A. Kumar

Publications

Mitchel J. Doktycz, Ph. D.

Biosciences / Center for Nanophase Materials Sciences

Oak Ridge National Laboratory

Oak Ridge, TN 37831

doktyczmj@ornl.gov

Publications:

1. Siuti, P., Green, C., Edwards, A. N., Doktycz, M. J., Alexandre, G. (2011) "Nitrogen availability modulates surface attachment of *Azospirillum brasilense* while changes in adhesive cell surface properties regulated by the chemotaxis-like pathway Che1 have an indirect role", FEMS Microbiology Letters, in press.
2. Siuti, P., Retterer, S. T., Doktycz, M. J. (2011) "Continuous protein production in nanoporous, picoliter volume containers", Lab on a Chip, in press.
3. Suresh, A. K., Doktycz, M. J., Wang, W., Moon, J.-W., Gu, B., Meyer III, H. M., Hensley, D. K., Allison, D. P., Phelps, T. J., Pelletier, D. A. (2011) "Monodispersed Biocompatible Silver Sulfide Nanoparticles: Facile Extracellular Biofabrication using the γ -proteobacterium, *Shewanella oneidensis*", ActaBiomaterialia, in press.
4. Gittel, N.R., Castro, H. F., Kerley, M, Yang, Z., Pelletier, D. A., Podar, M., Karpinets, T., Uberbacher, E., Tuskan, G. A., Vilgalys, R., Doktycz, M. J., Schadt, C. W. (2011) "Populus deltoides roots harbor distinct microbial communities within the endosphere and rhizosphere across contrasting soil types", Applied and Environmental Microbiology, in press.
5. Kumar, A., Mortensen, N. P., Mukherjee, P., Retterer, S. T. and Doktycz, M. J. (2011) "Electric field induced bacterial flocculation of Enterococci Escherichia coli 042", Applied Physics Letters, 98, 253701.
6. Mortensen, N. P., Fowlkes, J. D., Maggert, M., Treviño-Dopatka, S., Boisen, N., Doktycz, M. J., Nataro, J. P., Allison, D. P. (2011) "Effects of sub-minimum inhibitory concentrations of ciprofloxacin on enterococci Escherichia coli and the role of the surface protein dispersin", International Journal of Antimicrobial Agents, 38(1), 27-34.
7. Karig, D. K., Siuti, P., Dar, R. D., Retterer, S. T., Doktycz, M. J., Simpson, M. L., (2011) "Model for biological communication in a nanofabricated cell-mimic driven by stochastic resonance" Nano Communication Networks, 2, 39–49.
8. Allison, D.P., Sullivan, C.J., Mortensen, N.P., Retterer, S. T., Doktycz, M.J. (2011) "Bacterial Immobilization for Imaging by Atomic Force Microscopy" JOVE, in press 12/24/10
9. Suresh, A. K., Pelletier, D. A., Wang, W., Broich, M. L., Moon, J.-W., Gu, B., Allison, D. P., Joy, D. C., Phelps, T. J., and Doktycz, M. J. (2011) "Biofabrication of discrete spherical gold nanoparticles using the metal-reducing bacterium, *Shewanella oneidensis*" ActaBiomaterialia, 7(5), 2148-2152.
10. Edwards, A. N., Siuti, P., Bible, A. N., Alexandre, G., Retterer, S. T., Doktycz, M. J., Morrell-Falvey, J. L. (2011) "Characterization of cell surface and EPS remodeling of *Azospirillum*

- brasile* chemotaxis-like 1 signal transduction pathway mutants by atomic force microscopy”, FEMS Microbiology Letters, 314 (2), 131-139.
11. Srijanto, B., Retterer, S., Fowlkes, J. D., Doktycz, M.J. (2010) “Nanostructured silicon membranes for control of molecular transport” J. Vac. Sci. Technol. B, 28 (6), C6P48-C6P52.
 12. Pelletier, D. P., Suresh, A. K., Holton, G. A., McKeown, C., Wang, W., Gu, B., Mortensen, N. P., Allison, D. P., Joy, D. C., Allison, M. R., Brown, S. D., Phelps, T. J., Doktycz, M. J. (2010) “Engineered cerium oxide nanoparticles: Effects on bacterial growth and viability” Applied and Environmental Microbiology, 76(24), 7981-7989.
 13. Allison, D. P., Mortensen, N. P., Sullivan, C. J., Doktycz M. J. (2010) “Atomic Force Microscopy of Biological Samples” Wiley Interdisciplinary Reviews: Nanomedicine and Nanobiotechnology, 2(6), 618-634.
 14. Wang, W., Howe, J. Y., Li, Y., Qui, X., Joy, D. C., Paranthaman, M. P., Doktycz, M. J., Gu, B. (2010) “A Surfactant and Template-Free Route for Synthesizing Ceria Nanocrystals with Tunable Morphologies” J. Mater. Chem., 20(36), 7776-7781.
 15. Choi, C.K., Fowlkes, J.D., Retterer, S.T., Siuti, P., Iyer, S., Doktycz, M.J. (2010) “Surface Charge- and Space-Dependent Transport of Proteins in Crowded Environments of Nanotailored Posts”, ACS Nano, 4(6), 3345–3355.
 16. Suresh, A. K., Pelletier, D. A., Wang, W. Moon, J.-W., Gu, B., Mortensen, N. P., Allison, D. P., Joy, D. C., Phelps, T. J., Doktycz M. J. (2010) “Silver nanocrystallites: Biofabrication using *Shewanella oneidensis*, and an evaluation of their comparative toxicity on Gram-negative and Gram-positive bacteria” Environmental Science and Technology, 44, 5210–5215.
 17. Fowlkes, J. D., Doktycz, M. J., Rack, P. D. (2010) “An Optimized Nanoparticle Separator Enabled by Electron Beam Induced Deposition” Nanotechnology, 21, 165303.
 18. Retterer, S.T., Siuti, P., Choi, C.-K., Doktycz, M.J. (2010) “Development and Fabrication of Nanoporous Silicon Bioreactors within a Microfluidic Chip” Lab on a Chip, 10(9) 1174 - 1181.
 19. Edwards, A.N., Fowlkes, J.D., Standaert, R.F., Pelletier, D.A., Doktycz, M.J., and Morrell-Falvey, J.L. (2009) “An in vivo imaging-based protein interaction assay with high sensitivity for high-throughput applications” Analytical Biochemistry, 395, 166–177.
 20. Kalyanaraman, M., Retterer, S. T., McKnight, T. E., Ericson, M. N., Allman, S. L., Elkins, J. G., Palumbo, A. V., Keller, M., Doktycz, M.J. (2009) “Controlled microfluidic production of alginate beads for in situ encapsulation of microbes” IEEE Proceedings Biomedical Science & Engineering Conference, 2009. BSEC 2009. First Annual ORNL 18-19 March 2009 Page(s):1 - 4.
 21. Siuti, P., Retterer, S. T., Choi, C. K., Fowlkes, J. D., Doktycz, M. J. (2009) “Cell Free Translation in Engineered Picoliter Volume Containers” IEEE Proceedings of the First Annual ORNL Biomedical Science and Engineering Conference, IEEE Proceedings Biomedical Science & Engineering Conference, 2009. BSEC 2009. First Annual ORNL 18-19 March 2009 Page(s):1 - 4.
 22. Fletcher, B.L., Fern, J.T., Rhodes, K., McKnight, T. E., Fowlkes, J.D., Retterer, S.T., Keffer, D.J., Simpson, M.L., Doktycz, M. J. (2009) “Effects of ultramicroelectrode dimensions on the

- electropolymerization of polypyrrole” *Journal of Applied Physics*, 105(12) Article Number: 124312.
23. Pollas Mortensen, N. Fowlkes, J. D., Sullivan, C. J. Allison, D. P., Larsen, N. B. Molin, S. Doktycz, M. J. (2009) “The effects of the antimicrobial peptide colistin on surface ultrastructure and nanomechanics of *Pseudomonas aeruginosa* cells” *Langmuir*, 25(6) 3728-3733.
 24. Hildebrand, M., Holton, G., Joy, D.C., Doktycz, M. J., and Allison, D. P. (2008) “Diverse and conserved nano- and meso-scale structure of diatom silica revealed by atomic force microscopy” *Journal of Microscopy*, 235(2) 172-187.
 25. Fowlkes, J. D., Fletcher, B. L. Retterer, S. T., Melechko, A. V., Simpson, M. L., Doktycz, M. J., (2008) Size-selectivity and anomalous subdiffusion of nanoparticles through carbon nanofiber-based membranes, *Nanotechnology*, 19(41) Article Number: 415301.
 26. Lee CW, Kim MJ, Standaert R, Kim S, Owens E, Yan J, Choa YH, Doktycz M, Lee JS (2008) “Application of nanoparticles for materials recognition using peptide phage display technique - Part I: Preliminary study using LaPO₄ and TiO₂ nanoparticles” *Journal of the Korean Institute of Metals and Materials*, 46(1) 6-12.
 27. Lee CW, Kim MJ, Standaert R, Kim S, Owens E, Yan J, Choa YH, Doktycz M, Lee JS (2008) “Application of nanoparticles for materials recognition using peptide phage display technique - Part II: Magnetic bio-panning using Fe₃O₄ nanoparticles” *Journal of the Korean Institute of Metals and Materials*, 46(3) 131-134.
 28. Retterer, S.T., Melechko, A., Hensley, D. K., Simpson, M. L., Doktycz, M. J., (2008) “Positional control of catalyst nanoparticles for synthesis of high density carbon nanofiber arrays” *Carbon*, 46, 1378-1383.
 29. Pelletier, D.P., Hurst, G.B., Foote, L.J., Lankford, P.K., McKeown, C.K., Lu, T.-Y., Schmoyer, D.D., Shah, M.B., Hervey IV, W.J., Hooker, B., Daly, D.S., Gilmore, J., Wiley, S., Auberry, D., Wang, Y., Larimer, F.W., Kennel, S.J., Doktycz, M.J., Morrell-Falvey, J.L., Owens, E.T., Buchanan, M.V. (2008) “A general system for studying protein-protein interactions in Gram-negative bacteria, *Journal of Proteome Research*, 7(8), 3319-3328.
 30. Fletcher, B. L., Retterer, S. T., McKnight, T. E., Melechko, A. V., Fowlkes, J. D., Simpson, M. L., Doktycz, M.J. (2008) “Actuatable membranes based on polypyrrole-coated vertically aligned carbon nanofibers” *ACS NANO*, 2(2) 247-254.
 31. Hildebrand, M., Doktycz, M.J., Allison, D. P. (2008) “Application of AFM to understanding biomineral formation in diatoms” *Pflugers Archiv-European Journal of Physiology*, 456(1), 127-137.
 32. Betanzos-Cabrera, G., Harker, B. W., Doktycz, M. J., Weber, J. L., Beattie, K. L., (2008) “Channel glass-based detection of human short insertion/deletion polymorphisms by tandem hybridization”, *Molecular Biotechnology*, 38(2) 145-153.
 33. Betanzos-Cabrera, G., Harker, B. W., Doktycz, M. J., Weber, J. L., Beattie, K. L., (2008) “A comparison of hybridization efficiency between flat glass and channel glass solid supports”, *Molecular Biotechnology*, 38(1) 71-80.

34. Sullivan, C. J., S. Venkataraman, S., Retterer, S. T., Allison, D. P., Doktycz, M. J., (2007) "Comparison of the Indentation and Elasticity of *E. coli* and its Spheroplasts by AFM", *Ultramicroscopy*, 107, 934–942.
35. Doktycz, M. J. and M. L. Simpson (2007) "Nano-enabled synthetic biology" *Molecular Systems Biology*, 3:125.
36. Liu, Y., Das, S., Olszewski, R. E., Carpenter, D., Culiati, C. T., Sundberg, J. P., Soteropoulos, P., Liu, X., Doktycz, M. J., Michaud, E. J., and B. H. Voy (2007) "The Near Naked Hairless (HrN) Mutation Disrupts Hair Formation but is not Due to a Mutation in the Hairless Coding Region" *Journal of Investigative Dermatology*, 127(7) 1605-14.
37. Fletcher, B. L., McKnight, T. E., Fowlkes, J. D., Allison, D. P., Simpson, M. L., Doktycz, M. J. (2007) "Controlling the morphology of carbon nanofiber structures through the electropolymerization of pyrrole", *Synthetic Metal*, 157, 282–289.
38. Allison, D. P., Doktycz, M. J., (2006) "Cellular secretion studied by force microscopy" *J. Cell. Mol. Med.*, 10(4) 847-856.
39. Dhindsa, M. S., Smith, N. R., Heikenfeld, J., Rack, P. D., Fowlkes, J. D., Doktycz, M. J., Melechko, A. V., Simpson, M. L. (2006) "Reversible electrowetting of vertically aligned superhydrophobic carbon nanofibers", *Langmuir*, 22, 9030-9034.
40. Hildebrand, M., York, E., Kelz, J., Davis, A. K., Frigeri, L. G., Allison, D. P., Doktycz, M. J., (2006) "Nano-scale Control of Silica Morphology and Three-dimensional Structure during Diatom Cell Wall Formation", *J. Mater. Res.*, Vol. 21, No. 10, 2689-2698.
41. Beckmann, M. A., Venkataraman, S., Doktycz, M. J., Nataro, J. P., Sullivan, C. J., Morrell-Falvey, J., Allison, D. P. (2006) "Measuring cell surface elasticity on enteroaggregative *Escherichia coli* wild type and dispersin mutant by AFM", *Ultramicroscopy*, 106, 695–702.
42. Chourey, K., Thompson, M. R., Morrell-Falvey, J., VerBerkmoes, N. C., Brown, S. D., Shah, M., Zhou, J. Z. Doktycz, M, Hettich, R. L., and Thompson, D. K. (2006) "Global molecular and morphological effects of 24-h chromium (VI) exposure on *Shewanella oneidensis* MR-1" *Applied and Environmental Microbiology*, 72 (9): 6331-6344.
43. McKnight T. E., Peeraphatdit C., Jones S. W., Fowlkes J. D., Fletcher B. L., Klein K. L., Melechko A. V., Doktycz M. J., Simpson M. L. (2006) "Approaches for Site Specific Functionalization Along the Height of Vertically-Aligned Carbon Nanofiber Arrays" *Chemistry of Materials*, 18 (14): 3203-3211.
44. Fowlkes, J. D., Hullander, E. D., Fletcher, B. L., Retterer, S. T., Melechko, A. V., Hensley, D. K., Simpson M. L. and Doktycz M. J. (2006) "Molecular Transport in a Crowded Volume Created from Vertically Aligned Carbon Nanofibers: A Fluorescence Recovery after Photobleaching Study", *Nanotechnology*, 17, 5659-5668.
45. Venkataraman, S., Doktycz, M. J., Qi, H. Morrell-Falvey, J. L. (2006) "Automated analysis of fluorescence microscopy images to identify protein-protein interactions" *International Journal of Biomedical Imaging*, 2006, Article ID 69851, 1–10.
46. Venkataraman, S., Allison, D. P., Qi, H., Morrell-Falvey, J. L., Kallewaard, N. L., Crowe Jr., J. E., Doktycz, M. J. (2006) "Automated image analysis of atomic force microscopy images of Rotavirus particles", *Ultramicroscopy*, 106, 829-837.

47. Fletcher, B. L., McKnight, T. E., Melechko, A. V., Simpson, M. L. and Doktycz, M. J. (2006) "Biochemical Functionalization of Vertically Aligned Carbon Nanofibres" *Nanotechnology*, 17, 1-8.
48. Van Berkel, G. J., Ford, M. J., Doktycz, M. J., Kennel, S. J. (2006) "Evaluation of a Surface Sampling Probe Electrospray Mass Spectrometry System for the Analysis of Surface Deposited and Affinity Captured Proteins" *Rapid Commun. Mass Spectrom.* 20: 1-9.
49. Fowlkes, J. D., Melechko, A. V., Klein, K. L., Rack, P. D., Smith, D. A., Hensley, D. K., Doktycz, M. J., Simpson M. L. (2006) "Control of catalyst particle crystallographic orientation in vertically aligned carbon nanofiber synthesis" *Carbon*, 44, 1503-1510.
50. Fowlkes, J. D., Fletcher, B. L., Hullander, E. D., Klein, K. L., Hensley, D. K., Melechko, A. V., Simpson, M. L., and Doktycz, M. J., (2005) "Cell mimic structure with tailored membrane pore sizes; controlled synthesis, modeling, and passive diffusion experiments" *Nanotechnology* 16, 3101-3109.
51. Sullivan, C. J., Morrell, J. L., Allison, D. P., Doktycz, M. J. (2005) Mounting of Escherichia Coli Spheroplasts for AFM Imaging" *Ultramicroscopy*, 105, 96-102.
52. Fletcher, B. L., Hullander, E. L., Melechko, A. V., McKnight, T. E., Klein, K. L., Hensley, D. K., Simpson, M. L., Doktycz, M. J. (2004) "Microarrays of biomimetic cells formed by the controlled synthesis of carbon nanofiber membranes" *Nano Letters*, 4(10), 1809-1814.
53. Coffman, E. A., Melechko, A. V., Allison, D. P., Simpson, M. L., Doktycz, M. J. (2004) "Surface patterning of silica nanostructures using bio-inspired templates and directed synthesis" *Langmuir*, 20, 8431-8436.
54. Hoyt, P. R. and M. J. Doktycz (2004) "Optimized beadmilling of tissues for high throughput RNA production and microarray-based analyses" *Analytical Biochemistry*, 332(1), 100-108.
55. M. J. Doktycz, J. E. Johnson, M. J. Cornett (2004) "Hybrid valve structure for high throughput, low volume liquid handling applications" *Journal of the Association for Laboratory Automation*, 9(4), 250-256.
56. McKnight, T. E., Melechko, A. V., Guillorn, M. A., Merkulov, V. I., Doktycz, M. J., Culbertson, C. T., Jacobson, S. C., Lowndes, D. H., Simpson, M. L. (2003) "Effects of microfabrication processing on the electrochemistry of carbon nanofiber electrodes" *J. Phys. Chem. B*, 107 (39): 10722-10728.
57. McKnight, T. E, Melechko, A. V., Griffin, G. D., Guillorn, M. A., Merkulov, V. I., Serna, F., Hensley, D. K., Doktycz, M. J., Lowndes, D. H., Simpson, M. L. (2003) "Intracellular integration of synthetic nanostructures with viable cells for controlled biochemical manipulation" *Nanotechnology*, 14, 551-556.
58. Hoyt, P. R., Doktycz, M. J., Beattie, K. L., and Greeley, Jr, M. S. (2003) "DNA microarrays detect 4-nonylphenol-induced alterations in gene expression during zebrafish early development", *Ecotoxicology*, 12, 471- 476.
59. Doktycz, M. J., Sullivan, C. J., Hoyt, P. R., Pelletier, D. A., Wu, S. Allison, D. P. (2003) "AFM imaging of bacteria in liquid media immobilized on gelatin coated mica surfaces" *Ultramicroscopy*, 97(1-4), 209-216.

60. Reyes-López, M.-A., Méndez-Tenorio, A., Maldonado-Rodríguez, Doktycz, M. J., Fleming, J. T., Beattie, K. L. (2003) "Fingerprinting of prokaryotic 16S rRNA genes using oligonucleotide microarrays and virtual hybridization" *Nucleic Acids Res.*, 31 (2): 779-789.
61. Hoyt, P. R., Tack, L., Jones, B. L., Ahrweiller, P., Staat, S. and Doktycz, M. J. (2003) Automated high throughput probe production for DNA microarray analysis", *Biotechniques*, 34(2), 402-407.
62. Melechko, A. V., McKnight, T. E., Guillorn, M. A., Ilic, B., Merkulov, V. I., Doktycz, M. J., Lowndes, D. H. and M. L. Simpson (2003) "Vertically aligned carbon nanofibers as sacrificial templates for nanofluidic structures" *Appl. Phys. Lett.*, 82 (6): 976-978.
63. Buchanan, M. V. Larimer, F. W., Wiley, H. S., Kennel, S. J., Squier, T. J., Ramsey, J. M., Rodland K. D., Hurst, G. B., Smith, R. D., Xu, Y., Dixon, D., Doktycz, M. J., Colson, S., Gesteland, R., Giometti, C., Young, M., Giddings, M. (2002) "Genomes to Life "Center for Molecular and Cellular Systems": A Research Program for Identification and Characterization of Protein Complexes" *Omic: A Journal of Integrative Biology* 6(4), 287-303.
64. Melechko, A. V., McKnight, T. E., Guillorn, M. A., Austin, D. W., Ilic, B., Merkulov, V. I., Doktycz, M. J., Lowndes, D. H. and M. L. Simpson (2002) "Nanopipe fabrication using vertically aligned carbon nanofiber templates" (2002), *J Vac Sci Technol B*, 20 (6): 2730-2733.
65. Subramaniam, A., Oden, P. I., Kennel, S.J., Jacobson, K. B., Warmack, R. J., Thundat, T., Doktycz, M. J., (2002) "Microcantilever based calorimetric biosensing", *Appl. Phys. Lett.*, 81(2), 385-387.
66. Zhang, L., Melechko, A. V., Guillorn, M. A., Lowndes, D. H., Simpson, M. L., Doktycz, M. J. (2002) "Controlled particle transport across vertically aligned carbon nanofiber barriers", *Appl. Phys. Lett.*, 81(1), 135-137.
67. Fredrickson, H. L., Perkins, E. J., Bridges, T. S., Tonucci, R. J., Fleming, J. K., Nagel, A., Diedrich, K., Mendez-Tenorio, A., Doktycz, M. J., Beattie, K. L. (2001) "Towards environmental toxicogenomics: development of a flow-through, high-density, DNA hybridization array and its application to ecotoxicity assessment" *The Science of the Total Environment* 274, 137-149.
68. Hicks, J. S., Harker, B. W., Beattie, K. L., and Doktycz, M. J., (2001) "Modification of an automated liquid handling system for reagent-jet, nanoliter-level dispensing", *Biotechniques*, 30 (4), 878-885.
69. Kim, Y., Hurst, G. B., Doktycz, M. J., and M. V. Buchanan (2001) "Improving spot homogeneity by using polymer substrates in matrix-assisted laser desorption/ionization mass spectrometry of oligonucleotides", *Analytical Chemistry*, 73(11), 2617-2624.
70. Hoyt, P. R., Doktycz, M. J., Warmack, R. J., Allison, D. P., (2001) "Spin-column isolation of DNA-protein interactions from complex protein mixtures for AFM imaging", *Ultramicroscopy*, 86, 139-141.
71. P. R. Hoyt, M. J. Doktycz, P. Modrich, R. J. Warmack, and D. P. Allison, (2000) "Identifying Sequence Similarities Between DNA Molecules", *Ultramicroscopy*, 82, 237-244.
72. Subramanian, A., Kennel, S. J., Oden, P. I., Jacobson, K. B. Woodward, J., and Doktycz, M. J. (1999) "Comparison of Techniques for Enzyme Immobilization on Silicon Supports", *Enzyme and Microbial Technology*, 24, 26-34.

73. Doktycz, M. J., Larimer, F. W., Pastrnak, M., and Stevens, A. (1998) "Comparative Analyses of the Secondary Structures of Synthetic and Intracellular Yeast MFA2 mRNAs", *Proc. Natl. Acad. Sci. (USA)*, 95, 14014-14022.
74. Hurst, G. B., Weaver, K., Doktycz, M. J., Buchanan, M. V., Costello, A. M., and Lidstrom, M. E. (1998) "MALDI-TOF analysis of polymerase chain reaction products from methanotrophic bacteria", *Analytical Chemistry*, 70(13), 2693-2698.
75. Allison, D. P., Kerper, P. S., Doktycz, M. J., Thundat, T., Modrich, P., Larimer, F. W., Johnson, D. K., Hoyt, P. R., Mucenski, M. L. and Warmack, R. J. (1997) "Mapping individual cosmid DNAs by direct AFM imaging", *Genomics*, 41, 379-384.
76. Allen R. C., Doktycz, M. J. (1996) "Discontinuous electrophoresis revisited: A review of the process", *Appl. Theor. Electroph.*, 6(1), 1-9.
77. Allison, D. P., Kerper, P. S., Doktycz, M. J., Spain, J. A., Modrich, P., Larimer, F. W., Thundat, T. And Warmack, R. J. (1996) "Direct AFM imaging of *EcoRI* endonuclease site specifically bound to plasmid DNA molecules", *Proc. Natl. Acad. Sci. (USA)*, 96, 8826-8829.
78. Hurst, G. B., Doktycz, M. J., Vass, A. A., Buchanan, M. V. (1996) "Detection of bacterial DNA polymerase chain reaction products by matrix-assisted laser desorption/ionization mass spectrometry", *Rapid Commun. Mass Spectrom.*, 10, 377-382
79. Doktycz, M. J., Hurst, G. B., Habibi-Goudarzi, S., McLuckey, S. A., Tang, K., Chen, C. H., Uziel, M., Jacobson, K. B., Woychik, R. P. and Buchanan, M. V. (1995) "Analysis of PCR-amplified DNA products by mass spectrometry using matrix-assisted laser desorption and electrospray: current capabilities and limitations", *Analytical Biochemistry*, 230, 205-214.
80. Doktycz, M. J., Morris, M. D., Dormady, S. J., Beattie, K. L. and Jacobson, K. B. (1995) "Optical melting of 128 octamer DNA duplexes: effects of base pair location and nearest neighbors on thermal stability", *Journal of Biological Chemistry*, 270, No. 15, 8439-8445.
81. Doktycz, M. J., Habibi-Goudarzi, S., and McLuckey, S. A. (1994) "Accumulation and storage of ionized duplex DNA molecules in a quadrupole ion trap", *Analytical Chemistry*, 66, 3416-3422.
82. Lumetta, V. J. and Doktycz, M. J. (1994) "Electrophoresis for under five dollars", *Journal of College Science Teachers*, March/April, 314-316. Republished in "Favorite Demonstrations for College Science" B. R. Shmaefsky, Ed., NTSA Press, Arlington VA, 2004.
83. Paner, T. M., Gallo, F. J., Doktycz, M. J., and Benight A. S. (1993) "Studies of DNA dumbbells V: melting of a DNA triplex formed between a 28 base-pair DNA dumbbell substrate and a 16 base linear single strand", *Biopolymers*, 33, 1779-1789.
84. Doktycz, M. J., Paner, T. M., and Benight A. S. (1993) "Studies of DNA dumbbells IV: preparation and melting of a DNA dumbbell with the sixteen base-pair sequence: 5'GTATCCCTCTGGATAC3' linked on the ends by dodecyl chains", *Biopolymers*, 33, 1765-1777.
85. Doktycz, M. J. (1993) "Discontinuous electrophoresis of DNA: adjusting DNA mobility by trailing ion net mobility", *Analytical Biochemistry*, 213, 400-406.

86. Sheardy, R. D., Suh, D., Kurzinsky, R., Doktycz, M. J., Benight, A. S., and Chaires, J. B. (1993) "Sequence dependence of the free energy of B-Z junction formation in deoxyribonucleotides", *J. Mol. Biol.*, 231, 475-488.
87. T. Thundat, Allison, D. P., Warmack, R. J., Doktycz, M. J., Jacobson K. B., and Brown, G. M. (1993) "Atomic force microscopy of double and single stranded DNA on chemically treated mica", *J. Vac. Sci. Technol. A*, 11(4), 824-828.
88. Doktycz, M. J., Gibson, W. A., Arlinghaus, H. F., Allen, R. C., and Jacobson, K.B. (1993) "Use of resonance ionization spectroscopy to detect DNA bands on ultra-thin spin-coated gels", *Applied and Theoretical Electrophoresis*, 3, 157-162.
89. Doktycz, M. J., Arlinghaus, H. F., Allen, R. C. and Jacobson, K. B. (1992) "Electrophoresis and detection of tin-labelled DNAs on open-faced gels", *Electrophoresis*, 13, 521-528.
90. Doktycz, M. J., Goldstein, R. F., Paner, T. M., Gallo, F. J. and Benight A. S. (1992) "Studies of DNA dumbbells I: melting curves of 17 DNA dumbbells with different duplex stem sequences linked by T4 endloops evaluation of the nearest-neighbor stacking interactions in DNA", *Biopolymers*, 32, 849-864.
91. Doktycz, M. J., Benight, A. S. and Sheardy, R. D. (1990) "Energetics of B-Z junction formation in a sixteen base-pair duplex DNA", *J. Mol. Biol.* 212, 3-6.
92. Doktycz, M. J., Paner, T. M., Amaratunga, M. and Benight A. S. (1990) "Thermodynamic stability of the 5' dangling-ended DNA hairpins formed from the sequences 5'-(XY)₂GGATAC(T)₄GTATCC-3', where X,Y= A,T,G,C", *Biopolymers*, 30, 829-845.
93. Paner, T. M., Amaratunga, M., Doktycz, M. J. and Benight A. S. (1990) "Analysis of melting transitions of the DNA hairpins formed from the oligomer sequences d[GGATAC(X)₄GTATCC] (X=A,T,G,C)", *Biopolymers*, 29, 1715-1734.

Invited Book Chapters and Other Articles:

94. Neethirajan, S., Karig, D., Kumar, A., Mukherjee, P. P., Retterer, S. T., Doktycz, M. J. "Biofilms in microfluidic devices", in Encyclopedia of Nanotechnology, Ed: B. Bhushan, Springer, New York (In Press)
95. Doktycz, M.J., Sullivan, C.J., Mortensen, N., Allison, D.P. "Microbial Cell Imaging" in Life at the Nanoscale: Atomic Force Microscopy of Live Cells, Pan Stanford Publishing, (Y.F Dufrêne ed.) 2011.
96. Allison, D.P. Dufrêne, Y.F., Doktycz, M.J. and Hildebrand, M. "Biom mineralization at the Nanoscale: Learning from Diatoms" Methods in Cell Biology: Methods in Nano Cell Biology, B.P. Jena (Editor) Elsevier (2008)
97. McKnight, T. E., Melechko, A. V., Griffin, G. D., Guillorn, M. A., Merkulov, V. I., Doktycz, M. J., Ericson, M. N., Simpson, M. L. "Cellular Interfacing with Arrays of Vertically Aligned Carbon Nanofibers and Nanofiber-Templated Materials" in Nanotechnology in Biology and Medicine, Tuan Vo-Dinh, ed. CRC Press, (2006) 329-350.
98. Hoyt, P. R., Doktycz, M. J., and L. Tack, Chapter 5. Preparation of cDNA Probes for DNA Microarrays in DNA Sequencing II: Isolation and Preparation, Edited by Jan Kieleczawa, Jones and Bartlett Publishers (2006).

99. Doktycz, M. J. (2005) "Reagent jetting based deposition technologies for array construction" in *Microarray Technology and its Applications*, eds: D. Nicolau and U. R. Muller, Springer-Verlag Berlin Heidelberg
100. M. J. Doktycz (2002) "Nucleic acids: thermal stability and denaturation" in *Encyclopedia of the Life Sciences*, Macmillan Publishers Ltd., Nature Publishing Group www.els.net.
101. M. J. Doktycz (2000) "Discontinuous Electrophoresis" in *Encyclopedia of Separation Science*, edited by I. D. Wilson, T. R. Adlard, C. F. Poole and M. Cook, Academic Press, 1245-1250.
102. T. J. Whitaker, K. B. Jacobson, and M. J. Doktycz, (2000) "Preparation and Application of DNA Arrays" in *Encyclopedia of Analytical Chemistry: Instrumentation and Applications*, edited by R. A. Meyers, John A. Wiley & Sons, Ltd., 1219-1238.
103. Doktycz, M. J. (1998) "DNA Array Technology", *Advance for Administrators of the Laboratory*, 7(11), 53-55.
104. Allison, D. P., Doktycz, M. J., Hoyt, P. R., Thundat, T. and Warmack, R. J. (1997) "The analysis of genomes by atomic force microscopy", *Scanning*, 1997, 19, 136-137.
105. Doktycz, M. J. and Beattie, K. L. (1997) "Genosensors and Model Hybridization Studies" in *Automation Technologies for Genome Characterization*, edited by T. J. Beugelsdijk, John Wiley & Sons, Inc., p. 205-225.
106. G.B. Hurst, M.J. Doktycz, P.F. Britt, A.A. Vass and M.V. Buchanan, (1997) "Detection and analysis of polymerase chain reaction products by mass spectrometry." *Proceedings of SPIE*, Vol. 1985, 120.
107. Doktycz, M. J., Jacobson, K. B., Beattie, K. L., and Foote, R. S., (1995) "Optical melting as a tool for optimizing sequencing by hybridization analysis of DNA" in *Ultrasensitive Instrumentation for DNA Sequencing and Biochemical Diagnostics*, G. E. Cohn, J. M. Lerner, K. J. Liddane, A. Scheeline, S. A. Soper, Editors, Proc. SPIE 2386, 30-34.
108. Allison, D. P., Thundat, T. G., Modrich, P., Isfort, R. J., Doktycz, M. J., Kerper, P. S., Warmack, R. J. (1995) "Mapping site-specific endonuclease binding to DNA by direct imaging with atomic force microscopy" in *Ultrasensitive Instrumentation for DNA Sequencing and Biochemical Diagnostics*, G. E. Cohn, J. M. Lerner, K. J. Liddane, A. Scheeline, S. A. Soper, Editors, Proc. SPIE 2386, 24-29.
109. Allison, D. P., Doktycz, M. J., Thundat, T., Jacobson, K. B., Brown, G. M., and Warmack, R. J. (1993) "Scanning probe microscopy of immobilized DNA", *Polymer Preprints*, 34(2), 332-333.
110. Doktycz, M. J. (1993) "Nucleic acid separation" in *Gel Electrophoresis of Proteins Nucleic Acids and Selected Techniques*, eds. R. C. Allen and B. Budowle, Walter de Gruyter, Berlin.
111. Jacobson, K. B., Arlinghaus, H. F., Doktycz, M. J., Sachleben, R. A., Brown, G. M., and Larimer, F. W. (1993) "Development of resonance ionization spectroscopy for genome mapping and DNA sequencing using stable isotopes as DNA labels" In *Advances in DNA Sequencing Technology*, R. A. Keller, ed. SPIE vol. 1891, 27-65.