

## Outputs and Interactions – Biotechnology Division

### 1. Publications

#### 1a. Publications in Print

Abdulaev, N.G., Strassmaier, T.T., Ngo, T., Chen, R., Luecke, H., Oprian, D.D., and Ridge, K.D., “*Grafting Segments from the Extracellular Surface of CCR5 onto a Bacteriorhodopsin Transmembrane Scaffold Confers HIV-1 Coreceptor Activity*,” *Structure*, 10, 515-525 (2002).

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Bezrukov, S.M., and Kasianowicz, J.J., "**Dynamic Partitioning of Neutral Polymers into a Single Ion Channel**," NATO Advanced Research Workshop, Structure and Dynamics of Confined Polymers. Kluwer Press. Eds. J.J. Kasianowicz, M. Kellermayer and D.W. Deamer. pp. 117-130 (2002).

Burgess, S., Jaruga, P., Dodson, M.L., and Dizdroglu, M., "**Determination of Active Site Residues in Escherichia coli Endonuclease VIII**," J. Bio. Chem. 277, 4, 2938-2944 (2002).

Butler, J.M., Schoske, R., Vallone, P.M., Kline, M.C., Redd, A.J., and Hammer, M.F., "**A Novel Multiplex for Simultaneously Amplification of 20 Y Chromosome STR Markers**," Forensic Science International, 129, (1) 10-24 (2002).

Butler, J.M. and Becker, C.H., "**Improved Analysis of DNA Short Tandem Repeats With Time-of-Flight Mass Spectrometry**," Final Report for NIJ Grant 97-LB-VX-0003, Office of Justice Programs, National Institute of Justice (2001).

Butler, J.M., David, V.A., O'Brien, S.J., and Menotti-Raymond, M., "**The MeowPlex: A New DNA Test using Tetranucleotide STR Markers for the Domestic Cat**," Profiles in DNA, 5 (2), 7-10 (2001).

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Kasianowicz, J.J., Henrickson, S.E., Misakian, M., Weetall, H.H., Robertson, B., and Stanford, V., "*Physics of DNA Threading through a Nanometer Pore and Applications to Simultaneous Multianalyte Sensing*," NATO Advanced Research Workshop. Structure and Dynamics of Confined Polymers. Kluwer Press. Eds. J.J. Kasianowicz, M. Kellermayer and D.W. Deamer. pp. 141-163 (2002).

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Rodriguez, H., Marino, M., McAndrew, P., Atha, D.H., Jaruga, P., Birincioglu, M., Barker, P.E., and O'Connell, C., "**Biomarkers of PT53 Mutation and Y-Chromosome Loss Used to Detect Cellular/Genetic Damage in Tissue-Engineered Skin,**" *Biomedical Engineering: Recent Developments*. Ed. J Vossoughi, Medical and Engineering Publishers, Inc. (2002).

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Srinivas, P.R., Barker, P.E., and Srivastava, S., "**Nanotechnology in Early Detection of Cancer,**" *Lab Investigation*, 82 (5), 1-5 (2002).

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**1b. Manuscripts in review**

**(manuscripts that have been approved by the NIST internal review process and submitted for publication, but have not yet appeared in print)**

Atha, D.H., Miller, K., Sanow, A.D., Xu, J., Hes, J.L., Wu, O.C., Wang, W., Srivastava, S., and Highsmith, W.E., "***High-Throughput Analysis of Telomerase by Capillary Electrophoresis***," Electrophoresis (in press).

Barker, P.E., "***Cancer Biomarker Validation, Standards and Process: Roles for the National Institute of Standards and Technology (NIST)***," Annals of New York Academy of Sciences (in press).

Butler, J.M., Schoske, R., and Vallone, P.M., "***Highly Multiplexed Assays for Measuring Polymorphisms on the Y-Chromosome***," Progress in Forensic Genetics 9 (Brinkmann, B., eds.), Elsevier Science: Amsterdam, The Netherlands (in press).

Butler, J.M., "***High-Throughput Genotyping of Short Tandem Repeat DNA Markers with Time-of-Flight Mass Spectrometry***," Encyclopedia of Mass Spectrometry, Elsevier Science, New York (in press).

Butler, J.M. and Vallone, P.M., "***High Throughput Genetic Analysis through Multiplexed PCR and Multi-Capillary Electrophoresis***," PCR Technologies: Current Innovations (2<sup>nd</sup> edition), CRC Press, Boca Raton, Florida (in press).

Butler, J.M., "***Developing New Technologies in Forensic DNA Typing***," Proceedings of 16<sup>th</sup> International Symposium on the Forensic Sciences, (in press).

Elliott, J.T., Tona, A., Woodward, J.T., Jones, P.L., and Plant, A.L., "***Thin Films of Collagen Effect Smooth Muscle Cell Morphology***," Langmuir (in press).

Elliot, J., Meuse, C.W., Silin, V., Kreuger, S., Woodward, J.T., Petralli-Mallow, T.P., and Plant, A.L., "***Biomimetic Membranes on Metal Supports: Opportunities and Challenges***," Biomolecular Films: Design, Function, and Applications, ed. J. Rusling, Marcel Dekker, Inc., New York (in press).

Gilliland, G.L., Teplyakov, A., Obmolova, G., Tordova, M., Thanki, N., Ladner, J., Herzberg, O., Lim, K., Zhang, H., Huang, K., Li, Z., Tempczyk, A., Krajewski, W., Parsons, L., Yeh, D.C., Orban, J., Howard, A.J., Eisenstein, E., Parsons, J.F., Bonander, N., Fisher, K.E., Toedt, J., Reddy, P., Rao, C.V., Melamud, E., and Moulton, J., "***Assisting Functional Assignment for Hypothetical Haemophilus influenzae Gene Products through Structural Genomics***," Current Drug Targets – Infectious Disorders (in press).

Goldberg, R.N., *“Thermodynamics of Enzyme-Catalyzed Reactions,”* McGraw-Hill 2003 Yearbook of Science & Technology (in press).

Hancock, D.K., Schwarz, F.P., Song, F., Wong, L-J.C, and Levin, B.C., *“Design and Use of a Peptide Nucleic Acid for the Detection of the Heteroplasmic Low-Frequency MELAS (Mitochondrial Encephalomyopathy, Lactic Acidosis And Stroke-Like Episodes) Mutation in Human Mitochondrial DNA,”* Clinical Chemistry (in press).

Kasianowicz, J. J., *“Electrostatically Driven Polymer Translocation Through a Narrow Pore,”* Physical Review Letters (submitted)

Kasianowicz, J.J., *“DNA Transport in a Single Nanometer-Scale Pore,”* American Physical Society (submitted).

Kulin, S., Kishore, R., Hubbard, J. H., and Helmerson, K. *“Real Time Measurement of Spontaneous Antigen-Antibody Dissociation,”* Biophysical Journal (in press).

Lehmann, C., Lim, K., Chalamasetty, V.R., Krajewski, W., Melamud, E., Galkin, A., Howard, A., Kelman, Z., Reddy, P., Murzin, A., and Herzberg, O., *“The HI0073/HI0074 Protein Pair from Haemophilus influenzae is a Member of a New Nucleotidyltransferase Family: Structure, Sequence Analyses, and Solution Studies,”* Structure, Function, Genetics (in press).

Luy, B., Richter, U., DeJong, E., Sørensen, O.W., and Marino, J.P., *“Observation of H-bond Mediated  $^3\text{H}_{\text{H2H3}}$  Couplings Across Watson-Crick AU Base Pairs in RNA,”* Journal of Biomolecular NMR (in press).

Redd, A.J., Agellon, A.B., Kearney, V.A., Karafet, T., de Knijff, P., Park, H., Butler, J.M., and Hammer, M.F., *“Forensic Value of Fourteen Novel STRs on the Human Y Chromosome,”* Forensic Sci. Int. (in press).

Rist, M.J. and Marino, J.P., *“Mechanism of Nucleocapsid Protein Catalyzed Structural Isomerization of the Dimerization Initiation Site of HIV-1,”* Biochem. (in press).

Stödeman, M. and Schwarz, F.P., *“Importance of Product Inhibition in the Kinetics of the Acylase Hydrolysis Reaction by Differential Stopped Flow Microcalorimetry,”* Anal. Biochem. (in press).

Teplyakov, A., Obmolova, G., Reddy, P., Howard, A.J., and Gilliland, G.L., *“Crystal Structure of the YajQ Protein from Haemophilus influenzae,”* Journal of Structural Genomics (in press).

Tewari, Y.B, Vanderah, D.J., and Rozzell, J.D., *“Thermodynamics of the Lipase-Catalyzed Transesterification of 1-Phenyl-1-Alkanols and Butyl Acetate in Organic Solvents,”* Journal of Molecular Catalysis B: Enzymatic (in press).

Vallone, P.M. and Butler, J.M., "***Analysis of DNA Single Nucleotide Polymorphisms by Mass Spectrometry***," Encyclopedia of Mass Spectrometry, Elsevier Science, New York, (in press).

Willis, M.A., Krajewski, W., Chalamasetty, V.R., Reddy, P., Howard, A., and Herzberg, O., "***Structure of HI1333 (YhbY), a Putative RNA-binding Protein from Haemophilus influenzae***," Structure, Function, and Genetics (in press).

Zullo, S., Srivastava, S., Looney, J.P., and Barker, P.E., "***Nanotechnology: Emerging Developments and Early Detection of Cancer***," Cancer Markers (in press).

## **2. Talks**

Atha D. H. "***High Throughput Analysis of Telomerase by Capillary Electrophoresis***," Frederick Conference on Capillary Electrophoresis, NCI-Frederick, October 15, 2001.

Atha, D.H., "***High Throughput Analysis of Telomerase by Capillary Electrophoresis***," Gordon Research Conferences, New Frontiers in Cancer Detection and Diagnostics, Ventura, CA, March 10, 2002.

Atha, D.H., "***High-Throughput Screening of Cancer Biomarkers Using Capillary Electrophoresis***," Geron Corporation, Menlo Park, CA, March 18, 2002. (Invited)

Atha, D.H., "***High-Throughput Genetic and Expression Analysis by Capillary Electrophoresis***," Biotechnology Division Seminar, NIST, May 16, 2002.

Barker, P. E. "***NIST SRM 1951a as a Prototypic Serum Standard for Human Proteomics***", HUPO (Human Proteome Organization) Serum Proteomics Committee Meeting, Ann Arbor, Michigan, September 6, 2002.

Butler, J.M., "***MiniSTR Development to Aid Testing of Degraded Samples***," Scientific Working Group on DNA Analysis Methods (SWGDM), Quantico, Virginia, January 16, 2002.

Butler, J.M., "***SWGDM NIST Research Update***," Scientific Working Group on DNA Analysis Methods (SWGDM), Quantico, Virginia, January 16, 2002.

Butler, J.M., "***Recent Developments in Y-Chromosome Analysis of Y-STRs and Y-SNPs***," Y Chromosome Workshop at American Academy of Forensic Sciences, Atlanta, Georgia, February 12, 2002.

Butler, J.M., "***Developing New Technologies in Forensic DNA Typing***," 16<sup>th</sup> International Symposium on the Forensic Sciences, Canberra, Australia, May 13, 2002.

Butler, J.M., ***“Technologies for SNP Typing with Applications in Mitochondrial and Y Chromosome Markers,”*** SNP Workshop at 16<sup>th</sup> International Symposium on the Forensic Sciences, Canberra, Australia, May 15, 2002.

Butler, J.M., ***“Multiplex Assay Development for Mitochondrial and Y Chromosome DNA Testing,”*** National Institute of Justice DNA Grantees Meeting, Washington, DC, June 25, 2002.

Cole, K.D., ***“Membrane Technology for Selective DNA Separations,”*** Membrane Technology Separations Planning Conference, Business Communications Company, Newton, Mass. Dec. 4, 2001.

Cole, K.D., ***“Electrophoresis of Large Circular DNA in Gels,”*** Chemistry Department, Chalmers University of Technology, Goteborg, Sweden. May 2, 2002. *Invited*

Cole, K.D., ***“Controlling Electrophoretic Trapping of Circular DNA: Developments for Improved Analytical and Preparative Media,”*** National Meeting of the American Chemical Society, Boston, Mass. Aug. 20, 2002.

Dizdaroglu, M., ***“Mechanisms and Measurement of Oxidative DNA Damage and Repair,”*** Karmanos Cancer Institute, Medical School, Wayne State University, Detroit, MI, May 9, 2002.

Dizdaroglu, M., ***“Mechanisms of Oxidative DNA damage and Repair,”*** Oxygen Club of Greater Washington, D.C. 2002 Joint Conference entitled "Oxidative Stress: Molecular Mechanisms, Diseases and Therapeutics," NIH, Bethesda, MD, June 2, 2002.

Dizdaroglu, M., ***“Substrate Specificities and Excision Kinetics of DNA Glycosylases for Repair of Oxidative Damage to DNA Bases,”*** 32<sup>nd</sup> Annual Meeting of European Environmental Society, Warsaw, Poland, September 5, 2002.

Dizdaroglu, M., ***“Biomarkers of Oxidative DNA Damage used to detect Genetic Changes in Tissue Engineered Skin,”*** BIOMED 2002, IXth International Symposium on Biochemical Science & Technology, Kemer, Antalya, Turkey, September 20, 2002.

Dizdaroglu, M., ***“Oxidative DNA Damage and Repair,”*** Ege University, Faculty of Sciences, Izmir, Turkey, September 25, 2002.

Gallagher, D.T., ***“Protein Structure Measurements and Space Crystals,”*** Biotechnology Division Seminar, NIST, August 15, 2002.

Gilliland, G.L., ***“Structural Genomics: From Structure to Function,”*** Cold Spring Harbor Laboratory, Cold Spring Harbor NY, October 15, 2001.

Gilliland, G.L., "***Towards Traceability in Bioanalysis,***" CCQM (Consultative Committee for Amount of Substance) Workshop on Traceability Bureau International des Poids et Mesures, France April 15, 2002.

Gilliland, G.L., "***The Biological Macromolecule Crystallization Database: New Data, Crystallization Procedures and Strategies,***" XIX International Union of Crystallography Meeting, Geneva, Switzerland. August 14, 2002.

Gilliland, G.L., "***Biometrology:Developing the Measurements, Reference Materials and Standards Infrastructure for Emerging Technologies.*** EuroAnalysis XII, Dortmund Germany. September 12, 2002.

Gilliland, G.L., "***Biometrology:Developing the Measurements, Reference Materials and Standards Infrastructure for Emerging Technologies,***" Institute for Reference Materials and Measurements, Geel, Belgium, September 12, 2002.

Gilliland, G.L., "***Mitochondrial Proteomics: Developing the Measurements, Reference Materials, and Standards Infrastructure for Emerging Technologies,***" System Biology Approach to Healthcare: Mitochondrial Proteomics Workshop, NIST, September 17, 2002.

Goldberg, R.N., "***Thermodynamics of Enzyme-Catalyzed Reactions,***" First Annual National Institute of Standards and Technology/TRC Consortium Workshop, National Institute of Standards and Technology, Boulder, CO, November 1, 2001.

Goldberg, R.N., "***Thermodynamics of Enzyme-Catalyzed Reactions,***" Center for Advanced Research and Biotechnology, Rockville, MD, November 7, 2001.

Goldberg, R.N., "***Thermodynamics of Enzyme-Catalyzed Reactions: A Comprehensive Database,***" Middle Atlantic Regional Meeting of the American Chemical Society, George Mason University, Fairfax, VA, May 28, 2002.

Goldberg, R.N., "***Thermodynamics of Enzyme-Catalyzed Reactions: A Comprehensive Database,***" 57<sup>th</sup> Annual Calorimetry Conference, Rutgers University, New Brunswick, NJ, August 14, 2002.

Goldberg, R.N., "***Thermodynamics of Enzyme-Catalyzed Reactions,***" OLI Research, Morris Plains, NJ, August 14, 2002.

Goldberg, R.N., "***Thermodynamic Studies of Enzyme-Catalyzed Reactions,***" University of Maine, Orono, ME, September 20, 2002.

Hancock, D.K., "***Development and Use of Peptide Nucleic Acids (PNAs) to Detect Low-Frequency Heteroplasmic Polymorphisms in Human Mitochondrial DNA,***" 12<sup>th</sup> International Symposium on Human Identification, Biloxi, Mississippi, October 10, 2001.

Hancock, D.K., ***“Development and Use of Peptide Nucleic Acids (PNAs) to Detect Low-Frequency Heteroplasmic Polymorphisms in Human Mitochondrial DNA,”*** Mini-symposium on NIST Research in the Biological Sciences, Center for Advanced Research in Biotechnology, Rockville, MD, November 7, 2001.

Hancock, D.K., ***“Development and Use of Peptide Nucleic Acids (PNAs) to Detect Low-Frequency Heteroplasmic Polymorphisms in Human Mitochondrial DNA,”*** Third Annual Biotechnology Division Retreat, Shepherdstown, WV, May 23, 2002.

Holden, M.J., ***“Detection of Genetically Modified DNA Using the Polymerase Chain Reaction (PCR),”*** SIM General Assembly, Miami, FL December 2001.

Holden, M.J., ***“DNA Quantitation Pilot Study Using the Polymerase Chain Reaction,”*** CCQM Bioanalytical Working Group, BIPM, Paris, France, April 2002.

Holland, K.A., ***“MALDI-TOF Mass Spectrometry Examination and Comparison of the Proteomes from Different Species of Bacteria and the Effect of Cell Growth Stage,”*** Mini-symposium on NIST Research in the Biological Sciences, Center for Advanced Research in Biotechnology, Rockville, MD, November 7, 2001.

Holland, K.A., ***“Enhancement of the NIST Human Mitochondrial DNA Standard Reference Material 2392 - Addition of DNA from the HL60 Cell Line,”*** American Academy of Forensic Sciences, Atlanta, GA, February 15, 2002.

Kasianowicz, J.J., ***“Threading DNA through Single Nanopores: Eine Kleine Physik and Biotechnological Applications: Multifunctional Materials and Miniaturized Devices,”*** Max-Planck Institute für Polymerforschung. Mainz, Germany, November 20, 2001. *Invited*

Kasianowicz, J.J., ***“Threading DNA through a Nanometer-Scale Pore: Biophysical and Biotechnological Applications,”*** Biophysical Society Meeting, San Francisco, CA. February 15, 2002.

Kasianowicz, J.J., ***“Some Biology, Physics, and Applications of DNA Transport in Single Nanopores,”*** American Physical Society Meeting, Indianapolis, IN, March 18, 2002. *Invited*

Kasianowicz, J.J., ***“DNA Transport in Nanometer-Scale Pores,”*** Iowa State University, Dept. of Physics, Ames, IA, April 8, 2002. *Invited*

Kasianowicz, J.J., ***“Polynucleotide Transport in Single Nanopores: Potential Applications for Biology and Biotechnology,”*** USAMRIID, Frederick, MD, April 16, 2002. *Invited*

Kasianowicz, J.J., ***“Biosensors for the 21<sup>st</sup> Century,”*** ASM Resources Inc., 2002 Biotechnology Breakfast Series. Biosensors for the Market. American Society for Microbiology Resources, Inc., Breakfast Meeting for Biosensor Community, Hilton Embassy Row, Washington, DC. April 17, 2002. *Invited*

Kasianowicz, J.J., ***“Threading DNA Through a Single Nanometer-Scale Pore: Potential Applications in Biology and Biotechnology,”*** ACS Virginia Section Meeting, University of Charlottesville, Charlottesville, VA. April 26, 2002. *Invited*

Kasianowicz, J.J., ***“DNA Transport in Single Narrow Pores,”*** Dept. of Chemistry, University of Charlottesville, Charlottesville, VA, April 26, 2002. *Invited*

Kasianowicz, J.J., ***“DNA Transport in Nanopores,”*** NIH, NIAID, Rockville, MD, May 14, 2002.

Kasianowicz, J.J., ***“Threading DNA through Nanometer-Scale Pores,”*** Dept. of Physics and Astronomy, U. Pittsburgh, Pittsburgh, PA, May 29, 2002. *Invited*

Kasianowicz, J.J., ***“Biophysics of Ion Channels and Cell-Cell Fusion Processes,”*** Dept. of Physics and Astronomy, U. Pittsburgh, Pittsburgh, PA, May 30, 2002. *Invited*

Kasianowicz, J.J., ***“Multianalyte Sensors Based on Polymers and Single Nanopores,”*** 9<sup>th</sup> International Meeting on Chemical Sensors, Boston, MA, July 10, 2002.

Kasianowicz, J.J., ***“DNA Transport Through Single Nanopores: Processing Information Content within Biopolymers,”*** Int'l. Conference on Unsolved Problems of Noise and Fluctuations in Physics, Biology, and High Technology, NIH, Bethesda, MD, September 4, 2002. *Invited*

Kasianowicz, J.J., ***“DNA Transport Through Single Nanopores,”*** Dept. of Chemistry, Wheaton College, September 16, 2002. *Invited*

Kline, M.C., ***“NIST Mixed Stain Study #3 The 2001 Interlaboratory Challenge Exercise,”*** 5th Annual STR MegaPlex and Research Technology Workshop Hilton Head Island, SC, March 10-15, 2002

Kline, M.C., ***“Capillary Electrophoresis 101, the ABI 310/3100,”*** 5th Annual STR MegaPlex and Research Technology Workshop Hilton Head Island, SC, March 10-15, 2002

Kline, M.C., ***“Recovery of DNA from Aged Bloodstains on Untreated Paper,”*** 5th Annual STR MegaPlex and Research Technology Workshop Hilton Head Island, SC, March 10-15, 2002.

Kline, M.C., ***“Y-STRs and the International Scene,”*** 5th Annual STR MegaPlex and Research Technology Workshop Hilton Head Island, SC, March 10-15, 2002.

Kline, M.C., ***“Effects of Storage Temperature and Humidity Control on the Recovery of DNA from Aged Bloodstains,”*** American Academy of Forensic Sciences 54<sup>th</sup> Annual Meeting, Atlanta, GA, February 14, 2002.

Ladner, J.E., ***“Proteins along the Chorismate Pathway”*** CARB internal seminar, CARB, March 7, 2002.

Levin, B.C., ***“MITOANALYZER - A New NIST Human Mitochondrial DNA Interactive Web Site,”*** 12<sup>th</sup> International Symposium on Human Identification, Biloxi, Mississippi, October 10, 2001.

Levin, B.C., ***“MITOANALYZER - A New NIST Human Mitochondrial DNA Interactive Web Site,”*** Mini-symposium on NIST Research in the Biological Sciences, Center for Advanced Research in Biotechnology, Rockville, MD, November 7, 2001.

Levin, B.C., ***“Development of Procedures to Detect Specific Microorganisms and the Isolation of Nucleic Acids (DNA and RNA) and Proteins from Complex Environmental Samples,”*** AF Program Review, Melbourne, FL, January 10, 2002.

Levin, B.C., ***“A New Approach and Standard Reference Materials for Diagnosis of Mitochondrial DNA Diseases,”*** The United Mitochondrial Disease Foundation Mito-Dallas 2002 Symposium and Mitochondrial Standards Workshop: Laboratory Methods for the Diagnosis of Mitochondrial Disease, Dallas, Texas, June 8, 2002.

Levin, B.C., ***“Improvement of the NIST Human Mitochondrial Sequencing Standard Reference Material 2392 for FBI and Forensic Laboratories’ Use,”*** Third Annual DNA Grantees’ Workshop, National Institute of Justice, Washington, DC, June 24, 2002.

Levin, B.C., ***“Human Mitochondrial DNA Heteroplasmy: What, Why, Who, How, and Where?”*** Biotechnology Division Seminar, NIST, September 19, 2002.

Levin, B.C., ***“The Complete mtDNA Genome Sequence of Human Cell Line HL-60 and its Inclusion in the NIST Human Mitochondrial DNA Standard Reference Material SRM 2392,”*** 13<sup>th</sup> International Symposium on Human Identification, Phoenix, AZ, October 9, 2002.

Marino, J.P., ***“Designing and Screening Small Molecules that Target RNA Using Fluorescence and NMR Spectroscopy,”*** CHI Meeting on NMR: Drug Discovery and Design, McLean, VA, October 11, 2001.

Marino, J.P., ***“Targeting RNA: Development of Fluorescence and NMR Techniques to Identify Novel Therapeutics,”*** Department of Medicinal Chemistry, Virginia Commonwealth University, Richmond, VA, October, 2001.

Marino, J.P., ***“Biomolecular NMR,”*** CARB/NIST Symposium, Rockville, MD, November, 2001.

Marino, J.P., “***RNA Loop-Loop Complexes, Structural Variations on an Antisense Theme,***” Annual Meeting of the Biophysical Society, San Francisco, CA, February, 2002.

Marino, J.P., “***Targeting Retroviral RNA: Development of Fluorescence and NMR Techniques to Identify Novel Therapeutics,***” Department of Chemistry, Swarthmore College, PA, March, 2002.

Marino, J.P., “***Mechanism of NCp7 Chaperoned Structural Isomerization of the Dimerization Initiation Site of HIV-1,***” Department of Pharmacology & Molecular Sciences, Johns Hopkins University, Baltimore, MD, March, 2002.

Marino, J.P., “***Targeting RNA: Development of Fluorescence and NMR Techniques to Identify Novel Therapeutics,***” Biotechnology Annual Retreat, Shepherdstown, WV, May, 2002.

Marino, J.P., “***Targeting Retroviral RNA: Development of Fluorescence and NMR Techniques to Identify Novel Therapeutics,***” NIH AIDS Structural Biology Meeting, Bethesda, MD, June, 2002.

Marino, J.P., “***HIV-1 DIS: The Kiss of Death,***” Department of Chemistry, Yale University, New Haven, CT, June, 2002.

Marino, J.P., “***Drug Discovery and Development,***” Henry Stewart Conference, Washington, DC, July, 2002.

Marino, J.P., “***RNA Loop-Loop Complexes, Structural Variations on an Antisense Theme,***” International Conference on Magnetic Resonance in Biological Systems, Toronto, CA, August, 2002.

Meuse, C.W., “***New Measurement of Biomolecular Structure at Interfaces,***” ACS Colloid and Surface Science Symposium, June 2002.

Meuse, C.W., “***Infrared Spectroscopy Provides a New Parameter for Biological Ultrathin Films,***” 2<sup>nd</sup> International Workshop on Vibrational Spectroscopy of Monolayer Films, Bordeaux, France, July 2002.

Plant, A.L., “***Cell Membrane Hybrids for Cell Membrane Protein Screening,***” Industrial Liaison Office Meeting with MedImmune, March 14, 2002. *Invited*

Plant, A.L., “***Controlled Surface Chemistries and Quantitative Cell Response,***” American Physical Society, Indianapolis, March 20, 2002. *Invited*

Plant, A.L., “***Reference Surfaces, Indicator Cells and Metrology for Tissue Engineering,***” Biotechnology Division Seminar, NIST, April 18, 2002.

Plant, A.L., "***Designing Biomimetic Surfaces,***" Chemistry Department, Texas A&M University, College Station, May, 2002. (Invited)

Plant, A.L., "***Nonspecific Adsorption of Proteins in Implanted Biosensors,***" BECON Workshop on Sensors for Biological Research, NIH, Bethesda MD, June, 26, 2002.  
*Invited*

Plant, A.L., "***Controlled Surface Chemistries and Quantitative Cell Response,***" Gordon Research Conference on Signal Transduction by Engineered Extracellular Matrices, Connecticut College, New London, CT, June 27, 2002.

Plant, A.L., "***Thin Film ECM Mimics for Quantitating Cell Response,***" Institute for Medicine and Engineering, University of Pennsylvania, Philadelphia, September 23, 2002. *Invited*

Reddy, P., "***Diversity of Adenylyl cyclases in Mycobacterium Tuberculosis H37Rv,***" World Congress on Tuberculosis, Washington DC, June 3, 2002.

Reddy, P., "Molecular Cloning and Expression of the Gene for a Novel Protein from Mycobacterium Smegmatis with Functional Similarity to Eukaryotic Calmodulin," US-Japan Cooperative Medical Science Program. 37<sup>th</sup> Tuberculosis and Leprosy Research Conference, Kyoto, Japan, August 21, 2002.

Richie, K.L., "***Improvement of the NIST Human Mitochondrial DNA Standard Reference Material 2392 by the Addition of DNA from the HL-60 Cell Line,***" 12<sup>th</sup> International Symposium on Human Identification, Biloxi, MS, October 11, 2001.

Richie, K.L., "***Improvement of the NIST Human Mitochondrial DNA Standard Reference Material 2392 by the Addition of DNA from the HL60 Cell Line,***" Mini-symposium on NIST Research in the Biological Sciences, Center for Advanced Research in Biotechnology, Rockville, MD, November 7, 2001.

Richie, K.L., "***Improvement of the NIST Human Mitochondrial DNA Standard Reference Material 2392 by the Addition of DNA from the HL60 Cell Line,***" Third Annual Biotechnology Division Retreat, Shepherdstown, WV, May 23-24, 2002.

Ridge, K.D., "***Analysis of G-protein Coupled Receptor Function One Piece at a Time,***" Department of Biochemistry, Uniformed Services University of the Health Sciences, Bethesda, MD, November 6, 2001.

Ridge, K.D., "***Analysis of G-protein Coupled Receptor Function One Piece at a Time,***" Department of Biological Sciences, University of Maryland Baltimore County, Catonsville, MD, May 2, 2002.

Ridge, K.D., "***Analysis of G-protein Coupled Receptor Function One Piece at a Time,***" Department of Pharmacology, Johns Hopkins University School of Medicine, Baltimore, MD, May 9, 2002.

Ridge, K.D., "***Mapping Interactions Between G-protein  $\alpha$ -Subunit Carboxyl-Terminal Peptides and a Soluble Mimic of Activated Rhodopsin,***" International Gordon Research Conference on Photosensory Systems and Signal Transduction, Barga, Italy, May 20, 2002.

Ridge, K.D., "***Approaches for Screening G-Protein Coupled Receptor Functions,***" Vertex Pharmaceuticals, Cambridge, MA, July 18, 2002.

Ridge, K.D., "***Mapping Interactions Between Carboxyl-Terminal Peptides of the  $\alpha$ -Subunit of Transducin and a Functional Mimic of Light-Activated Rhodopsin,***" 10<sup>th</sup> International Conference on Retinal Proteins, Seattle, WA, August 24, 2002.

Rodriguez, H., "***Oxidative Stress Diagnostics/Therapeutics and Tissue Engineering: Standards for Tomorrow's Preventive Medicine,***" Sigma Xi Annual Meeting, November 15, 2001.

Rodriguez, H., "***Early Warning of Pathogenic (BW) Exposure to the Civilian Population: Development of an Oxidative Stress Early Detection Assay for the Measurement of Oxidative Damage to DNA,***" Defense Advanced Research Projects Agency, February 11, 2002.

Rodriguez, H., "***Optimal Health/Performance of Astronaut Crews: Monitoring Ionizing Radiation Exposure in Space Using a Portable Miniature Time-of-Flight Mass Spectrometer for Detecting Oxidative Stress Biomarkers,***" NASA, Washington, DC, February 18, 2002.

Rodriguez, H., "***The Role of NIST in Oxidative Stress Diagnostics/Therapeutics and Tissue Engineering,***" American Chemical Society of Washington, DC Chapter, February 21, 2002.

Rodriguez, H., "***Oxidative Stress DNA Biomarkers for the Early Detection of Biological Agents,***" Walter Reed Army Institute for Research, Dept. of Molecular Pathology, June 21, 2002.

Schwarz, F.P. "***Energetics of the Initiation of Transcription in E. Coli,***" Bioinformatics Colloquium, George Mason University, Manassas, VA, March 19, 2002. *Invited*

Schwarz, F.P., "***Importance of Product Inhibition in the Kinetics of the Acylase Hydrolysis Reaction by Differential Stopped Flow Microcalorimetry,***" 57<sup>th</sup> Calorimetry Conference, Rutgers University, N.J. Aug. 12, 2002.

Silin, V., "***Study of the Formation and Function of the Cell Membrane Hybrid Layers Containing G-Protein Coupled Receptors at SAM Surfaces,***" AVS 48<sup>th</sup> International Symposium, San Francisco, California, October 28, 2001.

Silin, V., "***Controlling Bio-Interface with Surface Plasmon Resonance Technique,***" Protiveris Inc., Gaithersburg, July 31, 2002. *Invited*

Tewari, Y.B., "Enzyme-Catalyzed Reactions in Organic and Unconventional Solvents," Biotechnology Division Seminar, NIST, June 20, 2002.

Vanderah, D.J., "***Structural Characterization of Self-Assembled Monolayers of the General Formula HS(CH<sub>2</sub>CH<sub>2</sub>O)<sub>3-8</sub>C<sub>n</sub>H<sub>2n+1</sub>***" Princeton University, February 4, 2002. *Invited*

Vanderah, D.J., "***Helical, Disordered, and What that Means: Structural Characterization of a New Series of Methyl 1-Thiaoligo(ethylene Oxide) Self-Assembled Monolayers,***" Spring Material Research Society Meeting 2002, San Francisco, CA., April 3, 2002.

Vanderah, D.J., "***Potential Standard Ultrathin Films: Identification of Isostructural Self-Assembled Monolayers,***" Spring Material Research Society Meeting 2002, San Francisco, CA. April 5, 2002.

Vanderah, D.J., "***Structural Characterization of Self-Assembled Monolayers of the General Formula HS(CH<sub>2</sub>CH<sub>2</sub>O)<sub>3-8</sub>C<sub>n</sub>H<sub>2n+1</sub>: Order, Disorder, and What that Means,***" Naval Research Laboratory, Washington, DC, May 8, 2002. *Invited*

Vanderah, D.J., "***Self-Assembled Monolayers of HS(CH<sub>2</sub>)<sub>0 or 1</sub>(CH<sub>2</sub>CH<sub>2</sub>O)<sub>5 or 6</sub>CH<sub>3</sub>,***" 76<sup>th</sup> ACS Colloid & Surface Science Symposium, Univ. of Michigan, Ann Arbor, MI., June 24, 2002.

Wang, L., "***Development of Fluorescence Intensity Standards,***" Naval Research Laboratory, Washington, DC, March 14, 2002.

Woodward J.T., "***Atomic Force Microscopy in Biology,***" Minisymposium on NIST Research in the Biological Sciences, CARB, Rockville, MD, November 7, 2001. *Invited*

Woodward, J.T., "***Characterizing Supported Lipid Membranes,***" Johns Hopkins University, Department of Materials Science, August 27, 2002. *Invited*

Woodward, J.T., "***Formation and Properties of Supported Membranes,***" Materials Research Society Meeting, Boston, MA, Nov. 27, 2001.

Woodward, J.T., "***Controlling Protein Thin Films for Biotechnology Applications,***" BioMEMS & Biomedical NANOTECH World 2002, Columbus, OH September 7, 2002.

### **3. Cooperative Research and Development Agreements (CRADAs) and Consortia**

Dynamically Controlled Protein Crystallization, D.T. Gallagher

Protein Databank

### **4. Patents Issued**

Reipa, V.P., Vilker, V.L., "Electroenzymatic Reactor and Method for Enzymatic Catalysis," US Patent No. 6,306,280 (Issued October 23, 2001).

Lacourciere, K.A., Stivers, J.T., and Marino, J.P. "Fluorescence Emission Perturbation (FREP): A Method for Detection of Ligand Binding to 2-Aminopurine Substituted Oligonucleotides," amended non-provisional patent under review.

### **5. Measurement Services**

#### **5a. SRM Activities**

SRM 1933      Microbeads with immobilized fluorescein isothiocyanate (FITC).  
SRM 2391b     Renewal all paperwork ROA and Draft Certificate submitted to OSRM in mid-July 2002  
SRM 2395      Production and certification of the materials ongoing and nearing completion  
SRM 2398  
SRM 2399      Fragile X (in progress)

#### **5b. SRD Activities**

SRM 2372      Prototype material under evaluation  
Protein Databank CD-ROMs NIST 80  
Prototype mitochondria database website

#### **5c. Calibrations**

none

### **6. Committee Assignments**

#### **P.E. Barker**

NCCLS FISH Methods Subcommittee (Member)

NIST TWGNAS Committee (Member)

NIST Fluorescence Intensity Workshop Organizing Committee (Member)

Organizing Committee, NIST Fluorescence Intensity Standards Workshop

Editorial Committee, Disease Markers  
USDA Animal Biotechnology Program (Reviewer)  
NIST-NCI Workshop Nanotechnology and Early Cancer Detection  
Genomics Section, EDRN Scientific Meeting (Chair)  
Proteomics Session Chair, EDRN Sixth Steering Committee meeting Ann Arbor  
(Sept. 33/4 2002)  
PACCT Strategy Group, National Cancer Institute (Observer).  
NCI Innovative Materials and Technology Study Section member, NIH/NCI (reviewer &  
Chairman, July 12, 2002)  
NWO Genomics Agency, Netherlands (reviewer)  
EDRN Image Analysis Committee (Committee Member)

**J.M. Butler**

World Trade Center Kinship and Data Analysis Panel (WTC KADAP)  
FBI's Scientific Working Group on DNA Analysis Methods (SWGDM)  
Cat DNA Advisory Committee  
Attorney General's Initiative on DNA Laboratory Backlog Reduction (AGID-LAB)  
National Institute of Justice's Convicted Offender Program Work Quality Acceptance  
Criteria Advisory Panel  
Ph.D. dissertation committee member and mentor for Richard Schoske (American  
University)  
Ph.D. dissertation committee member and mentor for Gordon Spangler (American  
University)

**A.K. Gaigalas**

NCCLS Subcommittee on Fluorescence Calibration for Cytometry and Receptor-Ligand  
Assays (Member)

**G.L. Gilliland**

Biotechnology Research Working Group of the Subcommittee on Biotechnology  
Reporting to the Office of Science and Technology Policy (Member)  
Board of Directors, Council of Biotechnology Centers, Biotechnology Industry  
Organization (Member)  
Co-chairman of the CCQM Bioanalysis Working Group National Institutes of Health,  
National Center for Research Resources, Shared Instrument Program Review  
Panel (Member)  
NASA Structural Biology Review Panel (Member)  
NASA Iterative Biological Crystallization Science Advisory Group (Member)  
ASTM Committee E-48 on Biotechnology (Member)

**R.N. Goldberg**

IUPAC, Commission on Biophysical Chemistry (IUPAC Fellow)  
ASTM Committee E-48 on Biotechnology  
Editorial Advisory Board of the Handbook of Chemistry and Physics (Member)

**M.J. Holden**

Intersociety Informational Network  
NIST Committee for Women

**J.J. Kasianowicz**

Co-organized the 9th International Meeting on Chemical Sensors, Boston, MA, July, 2002.

Member of the Steering Committee; North and South American Program Chair for the 10<sup>th</sup> and 11<sup>th</sup> International Meetings on Chemical Sensors to be held in Tsukuba, Japan (2004) and Brescia, Italy (2006).

NIST ATP Review Board (Winter, 2001)

**B.C. Levin**

Association of Government Toxicologists (Member, in charge of email distribution list)  
Toxic Substances Control Act, Interagency Task Committee (Alternate Member)  
NIST Committee for Women (Senior Advisor)  
NIST Chapter of Sigma Xi, (Executive Board Member)  
Ninth Annual Post-Doctoral Poster Presentation, NIST Sigma Xi (Organizer)  
ASTM Committee E-48 on Biotechnology (Member)  
Recombinant DNA Advisory Committee (DOC Representative)  
U.S. Technical Advisory Group to ISO/TC92/SC3 (member)

**J.P. Marino**

Ph.D. thesis committee of K.P. Sujatha, MOCB program  
Temporary Member, Center for Scientific Review, NIH, Study Section, Physical Biochemistry  
Member, Center for Scientific Review, NIH, Study Section, RCMI program project grant at Howard University  
Search Committee for NMR Facility Manager at CARB (Chairman)

**C.W. Meuse**

FY02 CSTL Colloquium Committee

**C. O'Connell**

CDC Genetic Forum  
NCCLS Subcommittee on Trinucleotide Repeats (observer)

**A.L. Plant**

NIH Bioanalytical Engineering and Chemistry Special Emphasis Panel.  
NIH/NHLBI Special Emphasis Panel (Tissues/Organs).  
ASTM Committee F04 on Medical and Surgical Materials and Devices, Division IV on Tissue Engineered Medical Products  
NIST Chapter of Sigma Xi

**P. Reddy**

Microbe Project Interagency Working Group

**K.D. Ridge**

Center for Scientific Review, NIH, Study Section VISC

Mr. Walter Schlapkohl's graduate student thesis committee, Program in Molecular and Cell Biology at the University of Maryland, College Park, MD (Ph.D. thesis committee member)

CARB Director's Search Committee

**K.L. Richie**

CSTL Diversity Committee (Member)

NCCLS Subcommittee on Trinucleotide Repeats (Observer)

**H. Rodriguez**

Oxygen Club of Greater Washington, D.C. – President-Elect 2002

Organizer and Co-Chairperson of the Oxygen Club of Greater Washington, D.C. 2002 Joint Conference entitled "*Oxidative Stress: Molecular Mechanisms, Diseases and Therapeutics*," held at the Lister Hill Center Auditorium, NIH, Bethesda, Maryland.

**F.P. Schwarz**

IUPAC Fellow

NSF Division of Molecular & Cellular Biosciences (Reviewer)

National Institutes of Health/Alcohol, Drug Abuse, and Mental Health Administration Scientific Committee (Reviewer)

Cold Neutron Research Facility at NIST (Reviewer)

Australian National Health and Medical Research Council (Reviewer)

Member of Association of Biomolecular Research Facilities

Program Chair of 57<sup>th</sup> Calorimetry Conference, Rutgers University, N.J., August 11-15, 2002.

Chair, Joint Meeting of the 58<sup>th</sup> Calorimetry Conference and the Japanese Society of Calorimetry and Thermal Analysis

**Y.B. Tewari**

ASTM Committee E-48 on Biotechnology (Member)

American Chemical Society (Member)

Calorimetry Conference (Member)

**7. Editorships****P. Barker**

Disease Marker (Associate Editor)

**J.M. Butler**

Journal of Forensic Sciences (Guest Editor)

**M. Dizdar**

Free Radical Research

Free Radical Biology & Medicine

Guest editor of Free Radical Biology & Medicine to organize a *Serial Reviews* on "Oxidative DNA Damage and Repair."

**G.L. Gilliland**

Protein & Peptide Letters (Associate Editor)

Biophysical Journal (Associate Editor)

PROTEINS: Structure, Function, and Genetics (Associate Editor)

**A.L. Plant**

Senior Editor of the American Chemical Society Journal, Langmuir

**K.D. Ridge**

Editorial Board, Journal of Biological Chemistry

**8. Seminars**

**November 29, 2001**

Professor Christopher A. Dyke, Ph.D., University of South Carolina "Model Studies Directed Toward the Syntheses of (-)-Hardwickiic Acid and Roseophilin" (Division Sponsor: D.J. Vanderah)

**December 7, 2001**

John Vrettos, Ph.D., Yale University, "An Investigation of the Roles of Calcium and Manganese in Photosystem II," (Division Sponsor: C.W. Meuse)

**January 3, 2002**

John L. Spudich, Ph.D., University of Texas, Houston, "Microbial Rhodopsins: Genomemining and Structure/Function Relationships in Transport and Signal Transduction," (Division Sponsor: K.D. Ridge)

**January 18, 2002**

Murugappan Muthukumar, Ph.D., Dept. of Polymer Science and Engineering, U Mass Amherst, "DNA Translocation Across Protein Channels," (Division Sponsor: J. J. Kasianowicz)

**January 22, 2002**

Diana Walker, Ph.D., University of Iowa, "Skeletor, a Novel Chromosomal Protein that Redistributes during Mitosis Provides Evidence for the Formation of a Spindle Matrix," (Division Sponsor: A. L. Plant)

**January 30, 2002**

Jeffrey B. Stock, Ph.D., Princeton University, "The Bacterial Nanobrain: Unforeseen Complexity in a Simple Sensory System," (Division Sponsor: K.D. Ridge)

**February 7, 2002**

R. Wayne Davies, Ph.D., University of Glasgow, "A New Insight into the Molecular Basis of Parkinson's Disease," (Division Sponsor: K.D. Ridge)

**February 11, 2002**

Kurt Langenbach, Ph.D., Stanford University, "The Dystroglycan Complex and Cell Survival Signaling in Muscle Cells" (Division Sponsor: A. L. Plant)

**March 5, 2002**

Rehka Panchal, Ph.D., NCI, "Potential Applications of Suppressor tRNA" (Division Sponsor: J. J. Kasianowicz)

**March 22, 2002**

Peter Jones, Ph.D., University of Colorado, "Adhesion Biology & Its Application to Tissue Engineering & Gene Therapy," (Division Sponsor: A. L. Plant)

**March 25, 2002**

Sergei Sukharev, Ph.D., University of Maryland, College Park, "The Mechanism of Gating of the Large Bacterial Mechanosensitive Channel, MscL," (Division Sponsor: K.D. Ridge)

**March 25, 2002**

Paul Tomlins, National Physical Lab, UK, "Opportunities for Collaborations in Standards Development for Tissue Engineering" (Division Sponsor, A.L. Plant)

**June 14, 2002**

Devanand Shenoy, Ph.D., Naval Research Laboratory, "Molecular Engineering of Materials: Effects at Interfaces and in the Bulk of Liquid Crystals," (Division Sponsor: J. J. Kasianowicz)

**June 19, 2002**

Hartmut Luecke, Ph.D., University of California, Irvine, "Light-driven Ion Pumping and Signaling by Bacterial Rhodopsins," (Division Sponsor: K.D. Ridge)

**9. Conferences/Workshops/Sessions Sponsored/Co-Sponsored****P.E. Barker**

Organizer, HER2 Workshop, NIST, Gaithersburg, MD, May 30, 2002

Organizer, Biosensors Meeting, NIST, Gaithersburg, MD, July 23, 2002

Co-organizer, Systems Biology Approaches to Health Care: Mitochondrial Proteomics, NIST, Gaithersburg, MD, September 17-18, 2002.

**J.M. Butler**

Organized “Forensic DNA Testing” session at Mid-Atlantic Meeting of the American Chemical Society (May 28, 2002)

**M.J. Holden**

Symposium Organizer “Biotechnology-Derived Crops: Detection and Measurement Issues” American Chemical Society, Mid-Atlantic Regional Meeting, Fairfax, VA, May 2002

**J.J. Kasianowicz**

Co-organized the 9th International Meeting on Chemical Sensors, Boston, MA, July, 2002

**B.C. Levin**

Co-Organizer of Mitochondrial Standards Workshop: Laboratory Methods for the Diagnosis of Mitochondrial Disease, Dallas, Texas, June 8, 2002.

Chaired and organized Ninth Annual Sigma Xi Post-Doctoral Poster Presentations, 2002 and arranged for luncheon where winner will be announced - Feb. 28, 2002 and March 7, 2002.

**F.P. Schwarz**

Program Chair, 57<sup>th</sup> Calorimetry Conference, Rutgers University, N.J., August 11-15, 2002.

Chair, Joint Meeting of the 58<sup>th</sup> Calorimetry Conference and the Japanese Society of Calorimetry and Thermal Analysis.

**G. Vasquez**

Systems Biology Approaches to Health Care: Mitochondrial Proteomics

**10. Other**

**J.M. Butler**

Received Presidential Early Career Award for Scientists and Engineers (PECASE) from President Bush in the White House (July 12, 2002)

Received British Medical Association’s Book Award for my book *Forensic DNA Typing* (November 15, 2001)

Received U.S. Department of Commerce Silver Medal Award from Secretary Don Evans (September 24, 2002)

**G.L. Gilliland**

George Washington University, Adjunct-Faculty Appointment

University of Maryland at Baltimore, Adjunct Faculty Appointment

University of Maryland Biotechnology Institute, Adjunct Faculty Appointment

**M.K. Gilson**

University of Maryland Biotechnology Institute, Adjunct Faculty Appointment

**M. Krauss**

University of Maryland Biotechnology Institute, Adjunct Faculty Appointment

**J.P. Marino**

University of Maryland Biotechnology Institute, Adjunct Faculty Appointment

California Institute of Technology, Adjunct Faculty University of Maryland, Lecturer

**A.L.Plant**

Competence Funding Award, 2002-2007: "Metrology for Tissue Engineering", Office of the Director of NIST.

NIH Bioengineering Research Partnership, 2002-2007: "Cold Neutrons for Biology and Technology" in collaboration with NIST CNR, UC Irvine, Penn State, LANL, and other institutions.

**K.D. Ridge**

University of Maryland Biotechnology Institute, Adjunct Associate Professor

**F.P. Schwarz**

University of Maryland Biotechnology Institute, Adjunct Professor

Member of the WERB board from 1991 to present

**A. Stoltzfus**

University of Maryland Biotechnology Institute, Adjunct Faculty Appointment