

DARRYL J. BORNHOP

Professor

Department of Chemistry & Biochemistry

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<http://www.ttu.edu/~chem/faculty/bornhop/bornhop.html>

EDUCATION

1987 Ph.D., Analytical Chemistry, University of Wyoming; (Mentor: Norman J. Dovichi)
1982 M.A., Environmental Science, University of Missouri, Columbia
1980 B.S., Chemistry, University of Missouri, Columbia

PROFESSIONAL EXPERIENCE

2002-Present Professor, Department of Chemistry and Biochemistry, Texas Tech
1994-Present Research Faculty, Southwest Cancer Center, University Medical Center, Texas Tech
1998-2002 Associate Professor, Department of Chemistry and Biochemistry, Texas Tech
1994-1998 Assistant Professor, Department of Chemistry and Biochemistry, Texas Tech
1989-1994 Adjunct Assistant Professor, Department of Biochemistry, University of Nevada
1993-1994 Vice President Research and Development, MediVisions, Inc., Seattle, WA
1991-1993 Senior R&D Engineer, Citation Medical, Reno, NV
1989-1991 Product Development Group Leader, Linear Instruments Division of Spectra Physics,
Reno, NV
1987-1989 Research and Development Group Leader, Lee Scientific Inc. (Dionex), Salt Lake
City, UT

RESEARCH INTERESTS

Molecular Imaging and Nanoscale Chemical and Biochemical Sensing through multi-disciplinary bioanalytical and biomedical research.

Projects currently underway:

- ◆ Synthesis, characterization and application of molecular imaging agents, particularly those for multi-modal signaling (fluorescence, MR, PET, CT).
- ◆ The application of molecular imaging for *in-vivo* early-stage disease detection, diagnosis, therapy delivery monitoring, surgical guidance and for *in-vitro* assays.
- ◆ Development of micro-endoscopic imaging methodologies.
- ◆ The quantification of solute transport in pathological tissue and the elucidation of mechanisms for M-cells involvement in chemical carcinogenesis.
- ◆ Nanoscale interferometry for chemical and biochemical analysis, particularly for label-free DNA and protein sequencing.
- ◆ Micro-fluidics for on-chip separations (CE, HPLC), patterning, high throughput screening, rapid biochemical assays, proteomics and point of care analysis.

HONORS

1983	Research Creativity Grant-Award, Montana State University
1989	Technical Leadership Award, Lee Scientific
1996-2000	Whitaker Foundation Biomedical Engineering Award
1998-2001	Member; NIH - NCRB Study Panel
1999-2001	Scientific Advisory Board; Torsana Biodiagnostics A/S
1999 (Summer)	Visiting Professor, Freie University, Berlin
2000	NSF Biomedical Engineering Review Panel Member
2000 - Present	Scientific Committee SmallTalk Conference
2001 - Present	Scientific Committee LabAutomation
2001	NSF Biomedical Engineering Review Panel Member
2001 – Present	Scientific Advisory Board; CelTor Biosystems
2002 – Present	Research Professor, Technical University of Denmark
2002	Chair, Breakout Session for NIH BECON Conference
2002	Council Nominee for the Society of Molecular Imaging
2003	NSF Biomedical Engineering Review Panel Member
2003 – Present	NCRB-Biomedical Technology Review Panel Member
2003 – Present	Member of the Canada Research Chairs Program College of Reviewers

PROFESSIONAL MEMBERSHIPS

American Chemical Society
 American Association for the Advancement of Science
 Biomedical Optics Society
 Optical Society of America
 International Society for Optical Engineering (SPIE)
 Association for Laboratory Automation
 Institute for Biotechnology, Texas Tech University
 Basic Research Group, Southwest Cancer Center UMC

SERVICE TO PROFESSION

Conference Organizing Committees and Chairmanships

Co-Organizer of a New Symposium “Chemistry and Biological Applications of Imaging Agents and Molecular Beacons (Spring 2004)
 Conference Organizing Committee, Advances in Optics for Biotechnology, Medicine and Surgery (2003)
 Nanotechnology Track (Five symposia), SmallTalk (2003)
 Co-Chair, Optical Probes for Biomedical Applications (SPIE BiOS-2004)
 Co-Chair, TEXMEMS IV (2002)
 Chair, Breakout Session, “Enabling Concepts and Materials for Future Biomedical Sensor Technology” for the NIH BECON Sensors Symposium (2002)
 Writing Committee Member, DOE Genomes to Life Imaging Workshop (2002)
 Scientific Committee Laboratory Automation (2001 – on)
 Reporters Conference Chair, SPIE-BiOS (2000 – 2003)
 Scientific Committee SmallTalk Conference (2000 – on)

Chair, Nonconventional Screening Approaches, CHI 9th Annual Meeting, Effective Drug Discovery (2002)

Technical Program Committee, OSA European Biomedical Optics Meeting (2001)

Conference on Diagnostic Tissue Spectroscopy – Optical Biopsy, EBiOS-2000 European Biomedical Optics The Netherlands (July 2000)

Co-Chair, SPIE-BiOS (2000)

Symposium Chair and Session Organizer, Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) Annual Meeting (1999).

Chair, Third Conference on Fluorescence Microscopy and Fluorescent Probes, Prague CZ (1999)

Co-Chair: BiOS-99 (1999).

Chair, BIOP Symposium on Biomedical Optics Demark, (1999).

Chair, CBMS'98, The IEEE Symposium on Computer-Based Medical Systems, Lubbock, TX (1998)

Chair, Benedette Pichler Symposium, Eastern Analytical Symposium (EAS) (1998)

Focus on the Life Sciences at the Annual Meeting of the Optical Society of America, Long Beach, CA (Oct. 1997)

Biomedical Optics Session Chair, Annual Meeting of the Optical Society of America. Rochester, NY (1996)

Symposium Chair, Annual Meeting of Optical Society of America (1996, 1997)

Optical Society of America Topical Meeting on, Lasers Applications to Chemical Analysis, Incline Village, NV (1990)

Symposium and Workshop on Supercritical Fluid Chromatography, Park City, UT (1988)

Advisory and Reviewer Activities

1997 - 2002	Consultant and Scientific Advisor; Dow Chemical Corporation
1999 - Present	Editorial Board Journal Biomedical Optics Scientific Advisory Board; Torsana Biodiagnostics A/S and CelTor Biosystems Center for the Study of Regional Economic and Industrial Development (CSREID)
1998 - 2002	Member National Institutes of Health Study Panel; NCCR Biomedical Technology
1998	Cottrell Scholars Award, Research Corporation
2000	External Reviewer; Dawn Richards, Ph.D., University of Alberta, Edmonton, Canada
2000	Member; NSF Biomedical Engineering Review Panel
2001	Chair, NCCR NIH, R-21 Review Panel
2002	Member; NSF Biomedical Engineering Review Panel
2002	Member; “Novel Technologies for Noninvasive Detection, Diagnosis and Treatment of Cancer” Review Panel
2002	Participant, Presenter and Co-Author, DOE “Genomes to Life Imaging” Workshop
2002	Member; Broad Agency Announcement NIH Review Panel
2002 - Present	Member of Scientific Advisory Board, Spectros Corporation
2003 - Present	Member, NIH-NCCR Biomedical Research Technology Study Panel
2003	Member, NIH-ZRG SRB Study Panel

Manuscripts for: Chemical Reviews, Electrophoresis, Analyst, Analytical Chemistry, Applied Optics, Medical Physics, Applied Spectroscopy, J. Biomedical Optics, J. Chromatographic Science, J. Chromatography, J. Microcolumn Separations, Photochemistry and Photobiology, Spectroscopy,

J. Opt. A. Pure Applied Optics, Computer Methods and Programs in Biomedicine, Fresenius' Journal of Analytical Chemistry, J. of Fluorescence, Talanta, Analytical and Bioanalytical Chemistry, Organic Letters and Journal of the American Chemical Society.

Proposals for: National Institutes of Health, National Science Foundation, National Sciences and Engineering Research Council of Canada, The Research Corporation and The Petroleum Research Foundation.

TEACHING

Texas Tech University

CHEM 1306 - Chemistry in Society
CHEM 1307 - General Chemistry
CHEM 2501 - Quantitative Chemical Analysis
CHEM 5317 - Analytical Spectroscopy and Biomedical Imaging

Northeastern University

MIM 1502 - Senior Mechanical Engineering Research - External Mentor and Co-Instructor

University of Nevada

BCH 795 - Detectors in Separation Science
BCH 795 - Analytical Separations

CURRENT LAB MEMBERS

Postdoctoral Fellows / Research Associates / Visiting Scientists

Ms. Malgorzata A. Wegiel
Dr. Frank Schumer (May-June 2003)

Graduate Students

Deepak Begari	Henrik Sørensen*
Tim Goebel	Dmitry Markov (co-advisor with EE)
Charles Manning	Joey Latham
Zhanling Wang	Stephen Dotson
Wei Zeng	Xhiqiang Du (co-advisor with Biology)

(*Co-advised through the Technical University of Denmark and RISØ National Laboratory)

Undergraduate Researchers

Nakita Patel (NSF REU* Fellow)	Rene Vinas (NSF REU* Fellow)
Jonathan Hopkins (HHMI** Fellow)	Becky Shires
Scott Wood (NSF REU* Fellow)	Michelle Sexton

(*Research Experience for Undergraduates, **Howard Hughes Research Program)

FORMER MEMBERS OF BORNHOP LAB

Postdoctoral Fellows / Research Associates / Visiting Scientists

Wang Guoping
Michael Houlne
Padmaja Sattu
Marjorie Stewart

Anne Skwierawska
Molly Dickens
John Griffin
Zhe Quan

Doctoral Degrees Supervised

Murray Hackett, 1991, Current position: Associate Professor, Departments of Chemical Engineering and Microbiology, University of Washington, Seattle, WA

Michael P. Houlne, 1998, Postdoctoral Fellow of Prof. Joel Harris, Department of Chemistry, University of Utah, Salt Lake City; Current position: Staff Scientist, Bayer Inc.

Kelly Swinney, 2000, Recipient of Song Dissertation Award, Postdoctoral Fellow of Dr. Michael Ramsey, Oak Ridge National Labs, Oak Ridge TN 2000-2002; Current Position: Scientist J&J Pharmaceutical Research & Development, Drug Evaluation-New Technologies, Raritan, NJ

Master Degrees Supervised

Hendra Tarigan, 1992
Darren Hubbard, 1998
John Griffin, 2000
Henrik Schiøtt Sørensen *
Henrik Pranov*

(*Co-advised through the Technical University of Denmark and RISØ National Laboratory)

Undergraduate Research Assistants

Chris Adair (HHMI Fellow)
Richard Decarlo
Joseph Hankins
C. Kyle Kenmore
Brooke Kubena
Stephen Hagedorn
David S. Laney
Shandra O'Briant
Jana Pennington
Neven Steinmetz
Mark Wilson (Electrical Engineering)
Tim Drake (NSF Fellow)

Jacob Kelly (HHMI Fellow)
Selena Kumar
Jennifer Nodorft (NSF Fellow)
Lauren Brown
Steven Roberts* (HHMI Fellow)
Adam Spencer* (HHMI Fellow)
Joel Ebuh
Keumboh Tangu
Michelle Holloway

High School Students

Joe Hankins
Tony Agent*
Amit Kothari*
Jonathan Hopkins*

Michelle Chang*
Shannon Moore*
Sheila Chang*
David Lu*

Kristin Norville (Lubbock High School
Clark Scholar)

Sheetal Wadera*

(*Welch Summer Scholars)

PLANNED SUBMISSIONS

1. National Institutes of Health: “On-chip Interferometry for Label-free Binding Assays”
2. National Science Foundation: “Nano-Scale Polarimetry”
3. National Institutes of Health: “The Role of the Peripheral Benzodiazepine Receptor in Cancer”

PUBLICATIONS - REFEREED JOURNALS

1. D.J. Bornhop and S.E. Manahan, "Isotope Dilution Analysis of Exchangeable Water in Coal, Coal Char and Activated Coal Char." *Analytical Letters*, 13(A12):1041-1061 (1980).
2. S. Kapila, D.J. Bornhop, S.E. Manahan and G.L. Nickell, "Design of a Combined Photoionization Detector and Photoionization-Based Electron Capture Detector." *J. Chromatography*, 259:205-210 (1983).
3. D.J. Bornhop and N.J. Dovichi, "Simple Nanoliter Refractive Index Detector." *Analytical Chemistry*, 58:504-505 (1986).
4. D.J. Bornhop, T.G. Nolan and N.J. Dovichi, "Sub-Nanoliter Laser-Based Refractive Index Detector for 0.25-mm ID Microbore Liquid Chromatography: Reversed-Phase Separation of Nanogram Amounts of Sugars." *J. Chromatography*, 384:181-187 (1986).
5. T.G. Nolan, D.J. Bornhop and N.J. Dovichi, "Crossed Beam Thermal-Lens Detection for 0.25-mm ID Microbore Liquid Chromatography: Separation of 2,4-Dinitrophenylhydrazones." *J. Chromatography*, 384:189-195 (1986).
6. F. Zarrin, D.J. Bornhop and N.J. Dovichi, "Laser Doppler Velocimetry for Particle Size Determination by Light Scatter within the Sheath Flow Cuvette." *Analytical Chemistry*, 59:854-860 (1987).
7. D.J. Bornhop and N.J. Dovichi, "Simultaneous Laser-Based Refractive Index and Absorbance Determinations Within Micrometer Diameter Capillary Tubes." *Analytical Chemistry*, 59:1632-1636 (1987).
8. D.J. Bornhop and N.J. Dovichi, "Subnanoliter Laser-Based Refractive Index Detector for 0.25-mm ID Capillary Liquid Chromatography." *LC-GC*, 5:427-429 (1987).
9. D.W. Later, D.J. Bornhop, E.D. Lee, J.D. Henion and R.C. Weibolt, "Detection Techniques for Capillary Supercritical Fluid Chromatography: UV, MS and FTIR." Feature Article *LC-GC*, 5, 9:804-816 (1987). Invited contribution.
10. N.L. Porter, B.E. Richter, D.J. Bornhop, D.W. Later and F.H. Beyerlein, "Fill Gas Effects on Reproducibility in Capillary SFC." *HRC & CC*, 10:477-478 (1987).
11. N.J. Dovichi, F. Zarrin, T.G. Nolan and D.J. Bornhop, "Laser Detectors for Capillary Liquid Chromatography." *Spectro. Chim. Acta Part B*, 43B:639-649 (1988).
12. D.J. Bornhop, S.S. Schmidt and N.L. Porter, "Use of Two Simultaneous Detectors in Capillary Supercritical Fluid Chromatography." *J. Chromatography*, 459:193-200 (1988).
13. D.J. Bornhop, B.J. Murphy and L. Krieger-Jones, "Chemiluminescence Sulfur Detection in Capillary Supercritical Fluid Chromatography." *Analytical Chemistry*, 61:797-800 (1989).

14. S.R. Weinberger and D.J. Bornhop, "Scanning UV Detection in Capillary Supercritical Fluid Chromatography." *J. Microcolumn Separations*, 1:90-95 (1989).
15. B.E. Richter, D.J. Bornhop, J.T. Swanson, J.G. Wangsgaard and M.R. Anderson, "Gas Chromatographic Type Detectors in SFC." *J. Chromatography*, 27:303-308 (1989).
16. D.J. Bornhop and J.G. Wangsgaard, "Optical Detection Methods in Supercritical Fluid Chromatography." *J. Chromatography*, 27:293-302 (1989).
17. A. Bruno, A. Paluis and D.J. Bornhop, "Cross-Beam RI-Absorbance Detection in the UV for Capillary Electrophoresis." *Applied Spectroscopy*, 45:462-467 (1991).
18. D.J. Bornhop, L. Hlousek, M. Hackett, H. Wang and G.C. Miller, "Remote Scanning Ultraviolet Detection for Capillary Gas Chromatography." *Review of Scientific Instruments*, 63:191 (1992).
19. D.J. Bornhop and J.G. Wangsgaard, "GC-UV: Capillary Gas Chromatography with Rapid Scanning Ultraviolet Detection." *HRC & CC* 14:344-347 (1991).
20. D.J. Bornhop and G. Verga, "Gasoline Analysis by Rapid Scanning Absorbance Detection and Capillary Gas Chromatography." *TrAC*, 11:194-198 (1992).
21. M. Hackett, H. Wang, G.C. Miller and D.J. Bornhop, "Rapid Scanning UV-Vis Detection for Capillary Gas Chromatography Using a Remote Flow Cell." *J. Chromatography A*, 695:243-257, (1995).
22. D.J. Bornhop, "Micro-Volume Index of Refraction Detection by Interferometric Backscatter." *Applied Optics*, 34:3234-3239, (1995).
23. H. Tarigan, C.K. Kenmore, P. Neill and D.J. Bornhop, "Capillary-Scale Refractive Index Detection by Interferometric Backscatter", *Analytical Chemistry*, 68:1762-1770, (1996).
24. D.J. Bornhop and J. Hankins, "Polarimetry in Capillary Dimensions", *Analytical Chemistry*, 68:1677-1684, (1996). *Cover article for the May 15 Issue.*
25. M.P. Houlne, T.S. Agent, G.F. Kiefer, K. McMillan and D.J. Bornhop, "Spectroscopy Characterization and Tissue Imaging using Site-Selective Polyazacyclic Terbium (III) Chelates" *Applied Spectroscopy*, 10:225-244, (1996).
26. C.K. Kenmore, S.E. Erskine and D.J. Bornhop, "Refractive Index Detection in Packed Capillary HPLC by Interferometric Backscatter". *J. Chromatography A*, 762:219-225, (1997).
27. M.P. Houlne and D.J. Bornhop, "Semi-quantitative Two Dimensional Flow Transport Imaging using Micro-Endoscopic Probes" *Optical Engineering*, 36: 1982-1991, (1997).
28. D.S. Hubbard, M.P. Houlne, G.E. Kiefer, H.F. Janssen, C. Hacker and D.J. Bornhop, "Diagnostic Imaging Using Rare-Earth Chelates", *Lasers in Medical Science*, 13:14-21, (1998).

29. M.P. Houlne, D.S. Hubbard, G.E. Kiefer and D.J. Bornhop, "Imaging and Quantitation of Tissue Selective Lanthanide Chelates Using an Endoscopic Fluorometer", *J. Biomedical Optics*, 3:145-153, (1998).
30. D.S. Hubbard, M.P. Houlne, G.E. Kiefer, K. McMillan and D.J. Bornhop, "Imaging and Quantitation of Tissue Selective Lanthanide Chelates", *Bioimaging*, 6:63-70, (1998).
31. K. Swinney, J. Pennington and D.J. Bornhop, "Universal Detection in Capillary Electrophoresis by Micro-Interferometric Backscatter", *Analyst*, 124:221-226, (1999). *Accelerated article and Hot Topic paper for The Journal*.
32. K. Swinney, J. Pennington and D.J. Bornhop, "Ion Analysis by Capillary Electrophoresis using MIBD", *J. Microchemical Society*, 62:154-163, (1999).
33. D.J. Bornhop, D.S. Hubbard, M.P. Houlne, C. Adair, G.E. Kiefer, B.C. Pence and D.L. Morgan, "Fluorescent Tissue Site-Selective Lanthanide Chelate, Tb-PTCMB for Enhanced Imaging of Cancer", *Analytical Chemistry*, 71:2607-2615, (1999).
34. M.P. Houlne, S.P. O'Briant, T. Goebel and D.J. Bornhop "Some Spectroscopic and Transport Properties of a Rare-Earth Chelate: Tb-PCTMP", *Analytica Chimica Acta*, 397:267-278, (1999). Special issue on the research of the emerging leaders in analytical chemistry.
35. M.M. Dickens, M.P. Houlne, S. Mitra and D.J. Bornhop, "Method of Depixelating Micro-Endoscopic Images", *Optical Engineering*, 38:1836-1842 (1999).
36. K. Swinney and D.J. Bornhop, "Universal Detection for Capillary Electrophoresis-Using Micro-Interferometric Backscatter Detection", *J. MicroColumn Separation*, 11:596-604, (1999).
37. K. Swinney, D. Markov, J. Hankins and D.J. Bornhop, "Micro-Interferometric Backscatter Detection using a Diode Laser", *Analytica Chimica Acta*, 400:265-280, (1999). A contribution to mark the 400th Volume and a result of the Measurement for the next Millennium conference in Egmond aan Zee, The Netherlands.
38. K. Swinney, J. Hankins and D.J. Bornhop, "Laser-Based Capillary Polarimeter", *J. Capillary Electrophoresis and Microchip Technology*, 6: 93-96, (1999).
39. K. Swinney and D.J. Bornhop, "A Review of CE Detection Methodologies", *CRC Critical Reviews in Analytical Chemistry*, 30(1): 1-30, (2000).
40. K. Swinney, D. Markov and D.J. Bornhop, "Ultra-Small Volume Refractive Index Detection using Micro-Interferometry", *Review of Scientific Instruments*, 71(7): 2684-2693, (2000).
41. D.J. Bornhop and K. Swinney, "Detection in Capillary Electrophoresis: A Review", *Electrophoresis*, 21: 1239-1250, (2000).

42. K. Swinney, D. Markov and D.J. Bornhop, "Chip-Scale Universal Detection using Backscattering Interferometry", *Analytical Chemistry*, 72: 2690-2695, (2000). *This was an Accelerated Article*.
43. K. Swinney and D.J. Bornhop, "D- β -Hydroxybutrate Reaction Kinetics Studied in Nanoliter Volumes using a Capillary Polarimeter", *Applied Spectroscopy*, 54: 1458-1469, (2000).
44. K. Swinney and D.J. Bornhop, "A Chip-Scale Universal Detector for Electrophoresis Based on Backscattering Interferometry", *Analyst*, 125: 1713-1717, (2000).
45. K. Swinney J. Nodorft and D.J. Bornhop, "Capillary-Scale Polarimetry for Flowing Streams", *Analyst*, 126, 673-675, (2001). (*Published on the Web as an Advance Article*).
46. D.J. Bornhop, C.H. Contag, K. Licha and C.J. Murphy, "Advances in Contrast Agents, Reporters and Detection", *J. Biomedical Optics*, 6: 106-110, (2001).
47. J.M.M. Griffin, A.M. Skwierawska, H.C. Manning, J.N. Marx and D.J. Bornhop, "Simple, High Yielding Synthesis of Trifunctional Fluorescent Lanthanide Chelates", *Tetrahedron Letters*, 42, 3823-3825, (2001).
48. K. Swinney and D.J. Bornhop, "Non-Invasive Picoliter Volume Thermometry Based on Backscatter Interferometry", *Electrophoresis*, 22: 2032-2036, (2001).
49. D. Markov and D.J. Bornhop, "Nanoliter-scale Non-invasive Flow-Rate Quantification using Micro-Interferometric Backscatter and Phase Detection", *Fresenius' Journal of Analytical Chemistry*, 371: 234-237, (2001).
50. K. Swinney and D.J. Bornhop, "Quantification and Evaluation of Joule Heating in On-Chip CE", *Electrophoresis*, Vol. 23 (4): 621-625 (2002).
51. K. Swinney J. Nodorft and D.J. Bornhop, "Nanoliter Volume Polarimetry", *Applied Spectroscopy*, 56(1): 134-138 (2002).
52. D. Markov, K. Norville, D. Lu, K. Swinney and D.J. Bornhop, "A Fourier Analysis Approach for Capillary Polarimetry", *Electrophoresis*, 23(5): 809-812, (2002).
53. H.C. Manning, T. Goebel, J.N. Marx and D.J. Bornhop, "Facile, Efficient Conjugation of a Trifunctional Lanthanide Chelate to a Peripheral Benzodiazepine Ligand Analogue", *Organic Letters*, 4(7), 1075-1078, (2002).
54. D. Markov and D.J. Bornhop, "Breaking the 10^{-7} for RI Measurements in Nanoliter Volumes", *Analytical Chemistry*, 74 (20), 5438-5441, (2002).
55. Z. Wang, K. Swinney and D.J. Bornhop, "Attomole Sensitivity for Proteins and Polypeptides with On-chip CE and Universal Detection by Interferometric Backscatter", *Electrophoresis*, 24, 865-873, (2003).

56. H.C. Manning, A.M. Skwierawska, J.N. Marx and D.J. Bornhop, "Rapid Removal of Benzyloxycarbonyl Groups from 1,4,7,10-Tetraazacyclododecane Derivatives by Catalytic Transfer Hydrogenation", *Synthetic Communications*, 33(3), 457-461, (2003).
57. H.S. Sørensen, H. Pranov, N.B. Larsen, D.J. Bornhop and P.E. Andersen, "Absolute Refractive Index Determination by Micro-Interferometric Backscatter Detection", *Analytical Chemistry*, 75 (8), 1946-1953, (2003).
58. T.S. Goebel, J.M.M. Griffin, B. Bell, M. Motamedi, and D.J. Bornhop, "Lanthanide Chelate Contrast Agents for the Detection of Malignant Lesions in the Syrian Hamster Cheek Pouch", Accepted in *Applied Spectroscopy*, (April 2003).
59. K. Swinney, D. Markov and D.J. Bornhop, "Label-Free Detection of Protein-Protein Interactions Using Backscattering Interferometry", Submitted to *Nature Biotechnology*, (March 2003).
60. H.C. Manning, J.M.M. Griffin, T.S. Goebel, M. A. Wegiel, R.C. Thompson, R.R. Price and D.J. Bornhop, "A PBR Targeted Molecular Imaging Agent for Cellular-Scale Bi-modal Imaging", Revision submitted to *Angewandte Chemie International Edition*, (April 2003).
61. H.C. Manning J.M.M. Griffin, T.S. Goebel, B. Bell, M. Motamedi and D.J. Bornhop "Novel Lanthanide Chelates for Biomedical Imaging" For submission to *JACS*.
62. M.P. Houlne, F. Koch, T.S. Goebel and D.J. Bornhop, "Structure Dependent Spectroscopic Properties of Europium and Terbium Chelate Complexes Used in Biomedical Imaging and Analysis," For submission to *JACS*.
63. D.J. Bornhop, G. Kieffer, P.J. Sattu, S. Robertson, D.L. Morgan, and B.C. Pence, "Colon Cancer Detection using an Exogenous Marker and Fluorescent Detection", In preparation for *Nature Biotechnology*.
64. S. Robertson, P.J. Sattu, D.L. Morgan, B.C. Pence and D.J. Bornhop, "Staging of Colon Cancer in the DMH Sprague Dawley Rat Model using Micro-Endoscopy" In Preparation for *Gastroenterology*.

Book Chapters

1. D.J. Bornhop and J.G. Wangsgaard, "UV Detection in SFC", in *Analytical Supercritical Fluid Chromatography*, Edited by M.L. Lee and K.E. Markides, Chromatography Conf. Inc, (1990).
2. D.J. Bornhop and B.E. Richter, "Detectors for Capillary Supercritical Fluid Chromatography", in *Detectors for Capillary Chromatography*, Chemical Analysis Series, Vol. 12, Chapter 14, 355-393, (1992), Wiley Interscience.
3. D.J. Bornhop and J.M.M. Griffin, "Cancer Detection", 2002 Yearbook of Science & Technology, McGraw-Hill, New York, NY.

4. D.J. Bornhop and Kai Lich, Chapter Title: “Fluorescent Probes in Biomedical Applications”, in the CRC Press *Biomedical Photonics Handbook*, Tuan Vo-Dinh, Editor, In Press, Scheduled for December 2002.

Selected Abstracts

1. M.S. Stewart, M.P. Houlne, D. Hubbard, B.C. Pence and D.J. Bornhop, “Investigations into the Effectiveness of a Fluorescent Tissue Marker for the Early Detection of Colon Cancer”, Society of Experimental Biology and Medicine, SEMB, (November 1997).
2. M. S. Stewart, M. Grimson, B. Pence, D. Bornhop, “Polyazamacrocyclic Tb Chelates: Investigations using a New Biomarker for Early Detection of Colon Cancer”, American Association of Cancer Research, AACR, (April 1998).
3. L.S. Gollahon, Z. Du, N. Patel, M. Pimsleur, D. Contreras, D.J. Bornhop, “Detection of HPV-infected Cells using an On-chip Hydrodynamic Focusing System”, American Association of Cancer Research, AACR, accepted for April 2002.

Patents

1. “Laser-Based Refractive Index Detector Using Backscatter.” D.J. Bornhop, US Patent # 5,325,170, issued June 28, 1994.
2. “Light Box.” D.J. Bornhop, R.B. Pillars, and Brad Clayton, US Patent #5,309,330 issued May 3, 1994. (European file #93277091.9, pending).
3. “Endoscope Scope Assembly for Full Hemisphere View.” J. B. Clayton, D.J. Bornhop, and G.H. Middle US Patent # 5,351,678 issued Oct. 4, 1994.
4. “Flexible Endoscope Probe and Method of Manufacture.” D.J. Bornhop, John B. Clayton, Allen G. Freiman and George H. Middle, US Patent # 5,456,245; Issued Oct. 10, 1995.
5. “Fluorescent Chelates as Visual Tissue Specific Imaging Agents.” G.E. Kiefer and D.J. Bornhop, US Patent #5,4928,627; Issued July 27, 1999.
6. “Methods of Formulation and Uses for Fluorescent Chelates as Visual Tissue Specific Imaging Agents.” G.E. Kiefer and D.J. Bornhop, US Patent Submitted August 2000.
7. “Interferometric Detection System and Method.” D.J. Bornhop, D. Markov and K. Swinney, US Patent # 6,381,025; Issued April 30, 2002.
8. “New Compounds for Fluorescence Diagnosis.” M. Buser, A. Becker, K. Licha and D.J. Bornhop, PCT International Patent 01250164.9, US patent application 09/571,407.
9. “Universal Detector for Biological and Chemical Separations for Assays using Plastic Microfluidic Devices.” D.J. Bornhop, K. Swinney and D. Markov, US and PCT Patents filed January 2001.

10. "Tissue Specific Fluorescent Chelates Possessing Long Wavelength UV Excitation." D.J. Bornhop, J.M.M. Griffin, T.S. Goebel and H. Charles Manning, US and PCT Patents (61248) filed October 2002.
11. "Multiuse Multimodal Imaging Chelates." D.J. Bornhop, T.S. Goebel, R. Thompson, and H. Charles Manning, US and PCT Patents filed September 2002.

Selected Non-refereed Articles

1. M.P. Houlne, D.S. Hubbard and D.J. Bornhop, "Characterization of Micro-Endoscopic Imaging Systems for Tissue Spectroscopy", Proc. Soc. Photo-Opt. Instrum. Eng., 2678: 464-474, (1996).
2. D.J. Bornhop, M.P. Houlne, C.K. Kenmore and J. Hankins, "Instrumentation for Biotechnology Feature Article: Capillary Interferometry." Laser Focus, 32:10, 83-90, (1996).
3. M.P. Houlne, D.S. Hubbard, G. Makhatadze, D.J. Bornhop, "Refractive Index-Based Calorimetric Studies of RNase T1 Unfolding in Small Volumes using Interferometric Backscatter", Proc. Soc. Photo-Opt. Instrum. Eng., 2982: 159-167, (1996).
4. D.S. Hubbard, M.P. Houlne, G.E. Kiefer and D.J. Bornhop, "Spectroscopic Evaluation of Polyazamacrocyclic Tb (III) Chelates for Application in Diagnostic Imaging", Proc. Soc. Photo-Opt. Instrum. Eng. 2980: 570-576, (1996).
5. M.M. Dickens, M.P. Houlne, S. Mitra and D.J. Bornhop, "A Soft Computing Method for the Removal of Pixelation in Micro-Endoscopic Images", Proc. Soc. Photo-Opt. Instrum. Eng. 3165: 186-194, (1997).
6. M. M. Dickens, D. J. Bornhop, and S. Mitra, "Removal of Optical Fiber Interference in Color Micro-Endoscopic Images", Proceedings for CBMS'98, the IEEE Symposium on Computer-Based Medical Systems, 46-52, (1998).
7. M.P. Houlne, T.S. Goebel and D.J. Bornhop, "Structure Dependent Spectroscopic Properties of Europium and Terbuim Chelate Complexes Used in Biomedical Imaging", Proc. Soc. Photo-Opt. Instrum. Eng., 3600: 64-75, (1999).
8. M.P. Houlne, T.S. Goebel and D.J. Bornhop, "Transport Investigations of Terbium Chelate Complexes in a Type I Collagen Tissue Model Using Quantitative Micro-endoscopic Imaging", Proc. Soc. Photo-Opt. Instrum. Eng., 3604:274-285, (1999).
9. J.M.M. Griffin, M. Motamedi, B. Bell and D.J. Bornhop, "A Lanthanide Chelate Contrast Agent for the Detection of Early Malignant Lesions in the Syrian Hamster Cheek Pouch", Proc. Soc. Photo-Opt. Instrum. Eng., 3604:274-285, (2001).

INVITED PRESENTATIONS

1987

Third International Laser Science Conference, Atlantic City, NJ

1988

9th ACS Rocky Mountain Regional Meeting, Las Vegas, NV.
Twelfth International Symposium on Column Liquid Chromatography, HPLC '88, Washington, DC

1989

National Meeting of the American Chemical Society, Miami, FL.
Conference and Workshop on SFC, Snowbird, UT

1991

Expert Speakers Series, Naval Weapons Center, China Lake, CA.

1992

Simon Fraser University, Burnaby, BC Canada.

1993

Texas Tech University, Lubbock TX.

1994

Department of Chemistry, Trinity University and Texas Lutheran College, San Antonio and Seguin,
TX

1995

Department of Chemistry, Brigham Young University, Provo, UT
Department of Chemistry, Utah State University, Logan UT
Department of Chemistry, Weber State University, Orem, UT
The 8th IEEE Symposium on Computer-Based Medical Systems; CBMS'95, Lubbock, TX
The Designs Chemical Group, The Dow Chemical Company, Freeport TX
Department of Chemistry, Trinity University and Texas Lutheran College, San Antonio and Seguin,
TX
Department of Chemistry, UT San Antonio, San Antonio TX

1996

Department of Chemistry, University of Texas-Dallas TX
Southwest Research Institute, San Antonio TX
Hewlett-Packard Research Laboratories, Palo Alto CA
Twenty-First Rare Earth Research Conference, Duluth MN
Award Symposium for recipient of the National ACS Award in Analytical Instrumentation, Professor
Norman J. Dovichi. Annual Meeting of the American Chemical Society, Orlando, FL
Fort Lewis College, Durango CO
National Meeting of Optical Society of America, Rochester NY
Second International Symposium on Micro Total Analysis Systems, Basel Switzerland
Institute for Applied Physics, University Bern, Bern Switzerland
Swiss Federal Institute of Technology of Lausanne, Lausanne Switzerland

1997

SPIE International Symposium on Biomedical Optics, BIOS 97, San Jose CA
Society of Western Analytical Professors (SWAP), SWAP-97, University of Arizona, Tucson AZ
Biosciences and Biotechnology Group, Los Alamos National Laboratory, Los Alamos, NM
Plenary Lecture, 2nd Conference on Fluorescence Microscopy and Fluorescent Probes, Prague, CZ
The Engineering Foundation: Conference on Advances in Optical Technology for Medicine &
Surgery, Snowbird UT
SPIE National Meeting, San Diego, CA
The Gordon Conference, New England College, NH
BIOS-97, San Remo, Italy

International Ion Chromatography Symposium; IICS-97, Santa Clara, CA
Department of Physiology, Texas Tech University Health Science Center, Lubbock, TX

1998

SPIE BiOS'98 International, San Jose, CA
Azko-Nobel Visiting Professor Lectureship Program, Dobbs Ferry, NY
Brigham Young University, Provo, UT
Department of Chemistry, University of Arizona, Tucson AZ
CBMS-98, The IEEE Symposium on Computer-Based Medical Systems, Lubbock, TX
Department of Chemistry, Arizona State University, Phoenix, AZ
Department of Bioengineering, Texas A&M University, College Station, TX
The Institute for Biological Computing, The Washington University Medical School, St. Louis, MO
Department of Chemistry, Northern Arizona University, Flagstaff AZ
Department of Chemistry, Ohio University, Athens, OH
BiOS-Europe98, Stockholm, Sweden
Institut für Diagnostikforschung an der FU, Berlin, Germany
The Biomedical Engineering Society (BMES) National meeting co-sponsored by the Cleveland Clinic Foundation, Cleveland, OH
Ethicon Endo-Surgery, A Johnson & Johnson Company, Cincinnati, OH

1999

PerSeptive Biosystems, a Division of P. E. Biosystems, Framingham, MA
BiOS-99, San Jose, CA
Pittsburgh Conference, Orlando, FL
Department of Chemistry, University of North Texas, Denton TX
Measurement for the Next Millennium, an international symposium sponsored by Elsevier Sciences to celebrate the 3rd millennium and volume 400 of *Analytica Chimica Acta*. Egmond aan Zee, The Netherlands
Jointly Sponsored by Center for Biomedical Engineering and Department of Internal Medicine, University of Texas Medical Branch, Galveston, TX
Department of Chemistry, Colorado State University, Fort Collins, CO
Jet Propulsion Lab, California Institute of Technology, Pasadena CA
Department of Chemistry, University of Wyoming, Laramie, WY
CLEO LEAP, Medical Applications of Lasers Section, Baltimore, MD
Keynote Lecture, BIOP Symposium on Biomedical Optics, Organized by RISØ National Laboratory and the Technical University of Denmark, Lyngby, Denmark
Imaging 2020, Jackson Hole, WY
FACSS-99, Vancouver, Canada
Small Animal Imaging Workshop, Organized by Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine, St. Louis, MO

2000

Biomedical Engineering, UCLA School of Engineering and Applied Science, Los Angeles, CA
Southwest Sciences Inc., Micro-Optics and Remote Sensing Group, Sante Fe, NM
BiOS-2000, San Jose, CA
Department of Chemistry, Colloquium Series, University of Missouri, Columbia, MO
Department of Chemistry, Purdue University, West Lafayette, IN
TEXMEMS, Texas Christian University, Dallas, TX
HPLC-2000, Seattle, WA

SmallTalk2000, San Diego, CA
Rocky Mountain Conference, Broomfield, CO
Department of Chemistry, University of Alberta, Edmonton AB Canada
Johnson & Johnson, Council of Research Directors, Cincinnati, OH
Department of Bioengineering and Department of Electrical Engineering, University of Southern California, Los Angeles, CA
Department of Bioengineering and the Beckman Laser Institute, University of California, Irvine CA
NanoTech2000, Montreux Palace, Montreux - Switzerland
Institute of Microtechnology, University of Neuchâtel, Neuchâtel - Switzerland
Pacifichem 2000, National ACS Meeting, Honolulu, Hawaii

2001

Department of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA, January 2001
Laboratory Automation 2001, Palm Springs, CA, January 2001
BiOS-2001, San Jose, CA, January 2001
Department of Chemistry, University of Delaware, Newark, DE, February 2001
Department of Chemistry, University of West Indies, Mona, Jamaica, March 2001
TEXMEMS, University of Texas, Dallas, TX, June 2001
NASA Glenn Research Center, Cleveland, OH, June 2001
Advances in Optics for Biotechnology, Medicine and Surgery, United Engineering Foundation, Banff, Canada, July 2001
RISØ National Laboratory and the Technical University of Denmark, Lyngby, Denmark, August 2001
SmallTalk2001, San Diego, CA, August 2001
Imaging in 2020 - II, Jackson Hole, WY, September 2001
57th Regional ACS Meeting, San Antonio, TX, October 2001
BIOP, RISØ National Laboratory, Roskilde, Denmark, October 2001
Oak Ridge National Laboratory, Oak Ridge, TN, November 2001
Applied Biosystems, Natick, MA, November 2001
Department of Biology, Texas Tech University, Lubbock, TX, December 2001

2002

BiOS-2002, San Jose CA, January 2002
Third Forum on Biomedical Imaging in Oncology, Sponsored by NCI, FDA and CMC, Washington DC, January/February 2002
University of Washington, Seattle, WA, February 2002
DOE Genomes to Life Imaging Workshop, Charlotte, NC, April 2002
Effective Drug Discovery, Cambridge Healthtech Institute's 9th Annual Meeting, Philadelphia, PA, May 2002
ART, Advanced Research Technologies Inc., Montreal Canada, June 2002
HPLC 2002, Montreal, Canada, June 2002
BECON Sensor Symposium, NIH, Washington, DC, June 2002
SmallTalk 2002, San Diego, CA, July 2002
Third NIH Inter-Institute Workshop on Diagnostic Optical Imaging and Spectroscopy, Washington, DC, September 2002
Department of Biomedical Engineering, Rice University, Houston, TX, November 2002

Pacific Northwest Laboratories, Environmental Molecular Science Laboratory, Richland, WA,
December 2002

2003

Washington State University, Department of Chemistry, Pullman, WA, February 2003

Baylor University, Department of Chemistry, Waco, TX, March 2003

Pittsburgh Conference on Spectroscopy, Orlando, FL, March 2003

Vanderbilt University, Department of Chemistry, Nashville, TN, April 2003

Scheduled Invitations

University of New Orleans, New Orleans, LA

Department of Radiology and Biomedical Engineering, Washington University School of Medicine,
St. Louis, MO

SmallTalk2003, San Jose, CA

European Conference on Biomedical Optics, Munich, Germany

Columbia University, Department of Biomedical Engineering and Department of Radiology, New
York, NY

NanoTech2003, Montreux, Switzerland

Midwest Regional ACS Meeting, Columbia, MO

Stanford University, Molecular Imaging Lecture Series, Palo Alto, CA

Anaheim ACS Meeting (2004), Anaheim, CA {Co-Organizer with Dr. Samuel Achilefu of a New
Symposium "Chemistry and Biological Applications of Imaging Agents and Molecular Beacons}