

David C. Muddiman, Ph.D
Professor of Chemistry



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Date and Place of Birth:
December 29, 1967
Long Beach, CA, USA

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EDUCATION AND PROFESSIONAL BACKGROUND

EDUCATION

- 1990 B.S., Chemistry; Gannon University, Erie, PA
<http://www.gannon.edu>
- 1990-1995 Ph.D., Analytical Chemistry, University of Pittsburgh, Pittsburgh, PA. Mentor: David M. Hercules <http://www.pitt.edu>
- 1995-1997 Department of Energy Postdoctoral Fellow, Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, WA Mentor: Richard D. Smith
<http://www.emsl.pnl.gov:2080/>

PROFESSIONAL BACKGROUND

- 2006-present Bioinformatics Graduate Program, North Carolina State University, Raleigh, NC
- 2006-present Biotechnology Graduate Faculty Member, North Carolina State University, Raleigh, NC
- 2005-present Professor of Chemistry, North Carolina State University, Raleigh, NC
- 2005-present Director and Founder, W.M. Keck FT-ICR Mass Spectrometry Laboratory, North Carolina State University, Raleigh, NC
- 2005-present Genomics Graduate Faculty Member, North Carolina State University, Raleigh, NC
- 2005-present Full Member, Center for Comparative Medicine and Translational Research, College of Veterinary Medicine, North Carolina State University, Raleigh, NC
- 2005-2008 Director, Mass Spectrometry Facility, Department of Chemistry, North Carolina State University, Raleigh, NC
- 2005-2007 Advisory Professor of Asthma/Allergy Center of Pediatrics, Sanggye Paik Hospital, Inje University, Seoul, South Korea
- 2002-2005 Professor of Biochemistry and Molecular Biology, Mayo Clinic College of Medicine, Rochester, MN
- 2002-2005 Director and Founder, W.M. Keck FT-ICR Mass Spectrometry Laboratory Research, Mayo Proteomics Research Center, Mayo Clinic College of Medicine, Rochester, MN
- 2003-2005 Full Member, Mayo Clinic Cancer Center, Mayo Clinic College of Medicine, Rochester, MN
- 2002-2005 Joint Professor of Molecular Pharmacology and Developmental Therapeutics, Mayo Clinic and Foundation, Rochester, MN
- 2000-2002 Associate Professor of Chemistry, Virginia Commonwealth University, Richmond, VA, <http://www.has.vcu.edu/che/>
- 1998-2002 Member, Massey Cancer Center, Medical College of Virginia, Richmond, VA, <http://www.vcu.edu/mcc/>
- 1998-2002 Adjunct Faculty, Department of Biochemistry and Molecular Biophysics, Medical College of Virginia, Richmond, VA
<http://views.vcu.edu/biochem/>
- 1999-2002 Director and Founder, Mass Spectrometry Center for the Study of Biocomplexity, Virginia Commonwealth University, Richmond, VA
<http://www.people.vcu.edu/~dcmuddim/mscsb/>

- 1997-2000 Affiliate Staff Scientist, Pacific Northwest National Laboratory, Richland, WA
<http://www.pnl.gov/>
- 1997-2000 Assistant Professor of Chemistry, Virginia Commonwealth University, Richmond, VA <http://www.has.vcu.edu/che/>
- 1996-1999 Adjunct Faculty, Department of Chemistry, Washington State University, Tri-Cities Campus, Richland, WA
<http://www2.tricity.wsu.edu/>

HONORS

- 1991 Safford Award for Excellence in Teaching, University of Pittsburgh, Pittsburgh, PA
- 1993-1994 British Petroleum Graduate Student Fellowship, University of Pittsburgh, Pittsburgh, PA
- 1999 American Society for Mass Spectrometry Research Award, Presented at National Meeting in Dallas, TX
- 2004 Arthur F. Findeis Award, American Chemical Society Presented at the National Meeting in Philadelphia, PA
- 2006 Invited Member, National Cancer Policy Forum on Developing Biomarker-Based Tools for Cancer Screening, Diagnosis, and Treatment: The State of the Science, Evaluation, Implementation, and Economics, Institute of Medicine, National Academies of Science
- 2009-2012 Elected, Board of Directors, United States Human Proteome Organization
- 2009 NCSU Alumni Association Outstanding Research Award

SOCIETY MEMBERSHIPS

American Chemical Society, Division of Analytical Chemistry
American Heart Association
American Society for Mass Spectrometry
Association of Biomolecular Resource Facilities
Society of Analytical Chemists of Pittsburgh
United States Human Proteome Organization
International Human Proteome Organization

CONSULTING EXPERIENCE

- 1999-2006 IonSpec Corporation, Irvine, CA
- 2000 University of Southern Denmark, Odense, Denmark
- 2000-2001 Anheuser-Busch, St. Louis, Missouri
- 2001 University of Arizona, Tucson, Arizona
- 2001 Eli Lilly, Indianapolis, Indiana
- 2002 Gannon University/Hamot Medical Center
- 2002 GlaxoSmithKline
- 2005 University of Wisconsin

2006-2009 Georgia Institute of Technology

UNIVERSITY, NATIONAL, AND INTERNATIONAL SERVICE

MAJOR ADMINISTRATIVE RESPONSIBILITIES

2005-present Director, W.M. Keck FT-ICR Mass Spectrometry Laboratory, North Carolina State University, Raleigh, NC

2002-2005 Director, Mayo Proteomics Research Center, Mayo Clinic College of Medicine, Rochester, MN.

1999-2002 Founder and Director, Mass Spectrometry Center for the Study of Bio-complexity, Departments of Chemistry and Life Sciences, Virginia Commonwealth University, Richmond, VA

2000-2002 Chair, Graduate Recruitment and Admissions, Department of Chemistry, Virginia Commonwealth University, Richmond, VA

UNIVERSITY AND FACULTY COMMITTEES

North Carolina State University, Raleigh, NC

2008-2010 Chair, University Standing Committee on Bookstores

2008-2009 Appointed, Hazardous Materials Committee

2008-2010 Appointed, Faculty Senate Liaison, University Research Advisory Council, Vice-Chancellor of Research

2008-2010 Member, Governance Committee

2008-2010 Re-Elected, Second Term of the Faculty Senate

2008-2009 Member, Governor Robert W. Scott Distinguished Professorship Selection Committee, Department of Chemistry

2008 Member, Chair Selection Committee, Department of Chemistry

2008 Chair, Mass Spectrometry Supervisor Recruitment Committee

2008 Chair, Mass Spectrometry Facility Director Recruitment Committee

2007 Member, Major Research Instrumentation Review Committee

2007-2008 Chair, Analytical Faculty Recruitment Committee

2007-2008	Chair, Mass Spectrometry Facility Director Recruitment Committee
2006-2008	Member, Personnel Policy Subcommittee of Faculty Senate
2006-2008	Elected, First-Term of Faculty Senate
2006-2007	Reviewer for Pew Scholars, Beckman, Searle and Dreyfus Internal Candidate Selection Committee
2006-	Co-Chair, New Chemistry Building Committee
2006-2007	Member, Allied Health Sciences Task Force and Chair of Research Team
2005-2008	Board Member, Metabolomics Proteomics Laboratory, College of Agriculture and Life Sciences
2005-2008	Member, Faculty Development and Promotion Committee
2005-2008	Collaborative Multidisciplinary Programs Committee
2005	Industrial and Government Relation Committee, Department of Chemistry
2005-2008	Member, Graduate Curriculum Committee, Department of Chemistry

Mayo Clinic College of Medicine, Rochester, MN

2005-2006	Member, Research Communications Subcommittee
2004-2005	Member, Genomics/Proteomics Accounting Oversight Workgroup
2004-2005	Member, Genomics Advisory Group
2004-2005	Member, Genomics Coordinating Committee
2003-2005	Advisory Committee and Consultant, Genomic, Proteomic and Metabolic Laboratory, Older American's Independence Center, General Clinical Research Center

Virginia Commonwealth University, Richmond, VA

2002	Third Year Review Committee, Dr. Charlene Crawley, Assistant Professor of Chemistry
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- 2001 Member, Search Committee for Two Tenure-Track Faculty Positions, School of Pharmacy
- 2001 Chair, Search Committee for Research Assistant Professor for the Mass Spectrometry Center for the Study of Biocomplexity, Department of Chemistry
- 2000 Member, Oversight Committee for Structural Biology Core Facility, Massey Cancer Center
- 2000-2001 Member, Search Committee for Chair of the Department of Biochemistry and Molecular Biophysics
- 1999-2002 Member, Electronic Thesis and Dissertation Task Force, Office of Graduate Research
- 1999-2001 Member, Steering Committee for Functional Genomics Program
- 1999 Member, Search Committee for Experimental Physical Chemist, Department of Chemistry

GUEST EDITOR – JOURNALS

1. *Analytical and Bioanalytical Chemistry*, Advances in Optical Spectroscopy and Mass Spectrometry (A Tribute to David Hercules). Guest editors: J.A. Gardella, Jr., F.E. Lytle, and D.C. Muddiman. Volume 373, Number 7, August 2002.
2. *Mass Spectrometry Reviews*, A Two-Issue Series Dedicated the Fundamentals and Applications of Fourier Transform Ion Cyclotron Resonance Mass Spectrometry, in press.
3. *Journal of the American Society for Mass Spectrometry*, Focus Issue Dedicated to Professor Jim McCloskey, Recipient of the 2005 Distinguished Contribution to Mass Spectrometry Award, American Society for Mass Spectrometry. Co-Guest Editor with Professor Patrick Limbach.
4. *International Journal of Mass Spectrometry* (A Tribute to the Life and Science and John B. Fenn). Guest Editors: M. Samy El-Shall and David C. Muddiman. TBP in Summer 2010.

ADVISORY BOARDS

- 2002-present *Mass Spectrometry Reviews*, Wiley
- 2002-present National Science Foundation FT-ICR Mass Spectrometry Facility, National High Magnetic Field Laboratory, *Florida State University*, Tallahassee, Florida.
- 2004-2006 Genome Canada Project, Consortium of Nine Universities in Ontario, Canada
- 2005-present Editorial Advisory Board, *Journal of Proteome Research*,

- American Chemical Society
- 2005-2010 Editorial Board Member, *Journal of the American Society for Mass Spectrometry*, Elsevier
- 2005-2010 Chair, External Advisory Committee for the Yale/NIDA Neuroproteomics Center
- 2006-present Editorial Advisory Board, *Rapid Communications in Mass Spectrometry*, Wiley
- 2006-2008 Educational Advisory Board, *GenNext Technologies*, Montara, CA
- 2006-present External Advisor for Establishing Clinical Proteomics Center, *University of Miami School of Medicine*, Miami, FL
- 2008-present Editorial Board Member, *Advances in Physical Chemistry*, Hindawi Publishing Corporation
- 2008-present Editorial Board Member, *Journal of Chromatography B*, Elsevier
- 2008-2013 NCRR/NIH Integrated Technology Resource for Biomedical Glycomics, Complex Carbohydrate Research Center, *University of Georgia*, Athens, GA

Ad Hoc Reviewer for:

Accounts of Chemical Research
Angewandte Chemie
Analytical and Bioanalytical Chemistry
Analytical Biochemistry
Analytical Chemistry
Analytica Chimica Acta
Analyst
Asian Journal of Andrology
Biochemistry
Bioinformatics
Bioorganic and Medicinal Chemistry Letters
Biotechniques
Chemical Communications
Chemistry – A European Journal
Clinical Biochemistry
Clinical Chemistry
Clinical Pharmacology and Therapeutics
Electrophoresis
Expert Opinion on Medical Diagnostics
Genome Biology

Industrial & Engineering Chemistry Research
International Journal of Mass Spectrometry
Journal of the American Chemical Society
Journal of the American Society for Mass Spectrometry
Journal of the Association of Official Analytical Chemists International
Journal of Chromatography A and B
Journal of Human Immunology
Journal of Lipid Research
Journal of Mass Spectrometry
Journal of Molecular Diagnostics
Journal of Organic Chemistry
Journal of Proteome Research
Journal of Proteomics
Journal of Pharmaceutical and Biomedical Analysis
Journal of Separation Science
Mass Spectrometry Reviews
Molecular and Cellular Proteomics
Molecular Biosystems
Organic Letters
Nucleic Acids Research
Physical Chemistry Chemical Physics
Proceedings of the National Academy of Sciences
Protein Science
Proteomics
Rapid Communications in Mass Spectrometry
RNA
Sensors
Science
Spectroscopy
Trends
Trends in Analytical Chemistry
Yonsei Medical Journal

EXTERNAL COMMITTEES/SYMPOSIA RESPONSIBILITIES/WORKSHOPS

Chair, Protein Biomarker Discovery, ADAPT Congress, Washington, DC **2009**

Program Committee, 56th American Society for Mass Spectrometry Conference, Denver, CO
2008

Program Committee, 55th American Society for Mass Spectrometry Conference, Indianapolis,
IN, **2007**

Presider, Analytical Chemistry Session, North Carolina American Chemical Society Session,
Duke University, Durham, NC, **2007**

Program Committee, 54th American Society for Mass Spectrometry Conference, Seattle, WA,
2006.

Co-Chair, American Association for Cancer Research, NCI and EORTC International Conference on "Molecular Targets and Cancer Therapeutics: Discovery, Biology and Clinical Applications for session entitled: "The Proteome and Drug Development", November **2005**, Philadelphia, PA

Chair and organizer of oral session, 53rd ASMS Conference on Mass Spectrometry and Allied Topics, "Bioinformatics", June **2005**, San Antonio, Texas

Organizer and Instructor for Workshop, Pittcon 2005, "NanoLC MS/MS for Proteomics Research", February **2005**, Orlando, FL.

Faculty Mentor, Department of Medicine's Coalition for Diversity Task Force Workshop "Thriving in Your Environment. Skills to Enhance Your Career", October **2004**, Rochester, MN

Organizer and Instructor for Workshop, Pittcon 2004, "NanoLC MS/MS for Proteomics Research", March **2004**, Chicago, IL.

Chair and organizer of oral session, Pittcon 2004, "Comprehensive Proteomic Measurements by Fourier Transform Ion Cyclotron Resonance Mass Spectrometry", **March 2004**, Chicago, IL.

Chair and organizer oral session, 51st ASMS Conference on Mass Spectrometry and Allied Topics, "DNA and DNA Complexes", **June 2003**, Montreal, Quebec, Canada.

Discussion Leader, Gordon Research Conference on Analytical Chemistry, "Measuring the Chemistry of Life", **June 2003**, Connecticut College, New London, Connecticut

LabAutomation2003 – Emerging and Enabling Technologies, Palm Springs, CA. **2003**. Genomics and Mass Spectrometry. Organizer and Session Chair

Scientific Committee, Lab Automation, Association for Laboratory Automation, **2002-Present**.

Federation of Analytical Chemistry and Spectroscopy Societies, **2002**, Providence, RI "High Performance Mass Spectrometry: From Fundamentals to Biological Applications" Organizer and Session Chair

Chair and organizer of oral session, 50th Annual Conference of the American Society for Mass Spectrometry, **2002**, Orlando, FL. "DNA Analysis by Mass Spectrometry"

LabAutomation2002 – Emerging and Enabling Technologies, Palm Springs, CA. **2002**. Genomics and Mass Spectrometry. Organizer and Session Chair

Participant, National Human Genome Research Institute Grantees' Workshop: Strategies for Increasing the Number of Underrepresented Minorities Participating in Genomics Research. **November 2001**.

Education Committee, American Society for Mass Spectrometry, **2000-2004**.

220th American Chemical Society Meeting, Washington, D.C., **2000**. Frontiers in Chemical Instrumentation. Organizer and Session Chair

Chair and organizer of oral session, 48th Annual Conference of the American Society for Mass Spectrometry, **1999**, Long Beach, CA. DNA Sequencing, Polymorphism and Damage Analysis "Ending" with RNA.

Young Mass Spectrometrists Interest Group Organizer, American Society for Mass Spectrometry, **1999-2001**.

NATIONAL AND INTERNATIONAL GRANT REVIEWING

- 1997-present National Science Foundation, *ad hoc* mail reviewer
- 1997-present American Chemical Society, Petroleum Research Fund, *ad hoc* mail reviewer
- 1999 *Ad Hoc Member*, National Institutes of Health Special Emphasis Panel, National Institute of Neurological Disorders and Stroke, "New Technologies for Monitoring Gene Expression in the Nervous System"
- 2000 Member, National Institutes of Health, National Institute for Drug Abuse, SBIR Contract Review, "Kits for DNA Micro-Array Technology"
- 2000 *Ad Hoc Member*, National Institutes of Health, National Cancer Institute, "Directors Challenge: Towards a Molecular Classification of Tumors"
- 2000 Member, National Science Foundation, Chemistry Research and Instrumentation and Major Research Instrumentation Panel Review
- 2000 Member, National Institutes of Health, Special Study Section for Instrument Proposals (S10 Applications)
- 2001 *Ad Hoc Member*, National Institutes of Health, National Cancer Institute, "Innovative Technologies for the Molecular Analysis of Cancer" March 2001
- 2001 *Ad Hoc Member*, National Institutes of Health, National Institute for Drug Abuse, SBIR Contract Review, "Kits for DNA Micro-Array Technology"
- 2001 Temporary Member, National Institutes of Health, National Human Genome Research Institute, Genome Study Section, June 2001.
- 2001 Member, National Institutes of Health Bioengineering Research Partnership Review Panel
- 2001 *Ad Hoc Member*, National Institutes of Health, National Human Genome Research Institute, Genome Study Section, November 2001.
- 2001 *Ad Hoc Member*, National Institutes of Health, National Cancer Institute, "Innovative Technologies for the Molecular Analysis of Cancer" November 2001
- 2002 Member, "High-End Instrumentation Review Panel", National Institutes of Health, March 2002
- 2002 Member, National Science Foundation, Chemistry, Major Research Instrumentation Panel Review
- 2002 NIH Special Emphasis Panel (Mass Spectrometry Shared Instrumentation Applications), National Institutes of Health, September 2002.

- 2003 *Ad Hoc Member*, National Institutes of Health, National Cancer Institute, "Innovative Technologies for the Molecular Analysis of Cancer" March 2003.
- 2003 NIH Special Study Section, Genetics and Engineering, National Institutes of Health, March 2003.
- 2003 NIH Special Study Section, Centers of Biomedical Research Excellence (COBRE), National Institutes of Health, May 2003.
- 2004 Member, "High-End Instrumentation Review Panel", National Institutes of Health, February 2004
- 2004-present W.M. Keck Foundation, *ad hoc* mail reviewer
- 2004 *Ad Hoc Reviewer*, The American Institute of Biological Sciences Initial Review Group for the US Army's Congressionally Directed, Peer Reviewed Medical Research Program, May 2004
- 2004 *Ad Hoc Reviewer*, United Kingdom Research Councils, Interdisciplinary Research Collaboration in Proteomic Technologies, June 2004
- 2004 Member, Special Emphasis Panel: Biodefense and SARS Product Development, National Institute of Allergy and Infectious Diseases, National Institutes of Health, May 2004
- 2004 *Ad Hoc Reviewer*, Indiana 21st Century Research & Technology Fund, June 2004
- 2004 Member, National Institutes of Health, Special Study Section for Instrument Proposals (S10 Applications)
- 2005-2009 *Charter Permanent Member*, National Institutes of Health, Enabling Bioanalytical and Biophysical Techniques Study Section
- 2005 *Ad Hoc Reviewer*, National Institutes of Health, National Cancer Institute Special Emphasis Panel, Innovative Molecular Analysis Technologies
- 2005 Reviewer, Genome Canada Multi-Site \$35M Project
- 2006 *Ad Hoc Reviewer*, National Institutes of Health, National Institute on Drug Abuse. Cutting-Edge Basic Research Awards
- 2006 *Ad Hoc Reviewer*, National Institutes of Health, National Cancer Institute, Innovations in Cancer Sample Preparation
- 2006 A-T Children's Project
- 2006 U.S. Department of Energy ORNL Genomics: Genomes to Life Program Project Review, \$30M Project, Site Visit, June 2006
- 2006 National Science Foundation CAREER Awards
- 2006 Louisiana Board of Regents
- 2007 Georgian National Science Foundation (www.gnsf.ge)
- 2007 Genome CANADA Panel Review, Toronto, CA
- 2008 *Ad Hoc Reviewer*, National Institutes of Health, CMBK Member Conflicts Panel
- 2008 *Ad Hoc Reviewer*, National Institutes of Health, NIBIB Panel
- 2008 Panel Member, Innovative Molecular Analysis Technologies, National Cancer Institute, Bethesda, MD
- 2008 Panel Member, NIBIB Panel for T and K Awards, National Institutes of Health
- 2011 Challenge Grants, National Institutes of Health

External Promotion and Promotion with Tenure Reviewer

17 packages as of 10/2009

National and International Award Committees

American Chemical Society
The EWR Steacie Memorial Fund
American Society for Mass Spectrometry

TEACHING PHILOSOPHY, COURSES TAUGHT, AND STUDENTS MENTORED

Teaching Philosophy

*"A collection of facts is no more a science than a heap of stones is a house."
-J.H. Poincare*

Whether in chemistry or any other discipline, the key to true learning lies in making connections between the material being taught with what's already known and, ultimately, with what remains to be learned. The above statement and its implications form the cornerstone of my teaching philosophy. In this regard, the key to good teaching is the ability to make these connections.

The first step in my approach toward teaching using this "integrated" approach is my firm commitment to a **dynamic learning environment**. I feel this is particularly important in chemistry where the difficulty students may have with the material often "gets in the way of" building bridges between chemistry and the world around them. A dynamic learning environment is fostered by an atmosphere of curiosity, one where the focus is on **learning** rather than on **teaching**. I develop this atmosphere by not only encouraging students to ask questions, but by asking questions myself. We then discuss these questions as a class: What makes them interesting? How might we answer them?

Second, I believe an essential component of good teaching is the ability to **understand the students**. The bridge between teacher and student must be built before any other connections can be made. I have always been able to develop a good rapport with my students. This enables me to view chemistry from their perspective, then teach them chemical concepts using words and ideas that are understandable, meaningful, and interesting to them.

Finally, the ultimate tool is **teaching by example**. When students see examples of how the material being taught relates to other chemical, physical, biological and mathematical principles, they learn to make these connections on their own. There are many ways that I make these examples. A vital component of my teaching style is the connection of the material being taught with the real world around them which helps them conceptualize topics that might otherwise be difficult.

While my teaching philosophy emphasizes an integrated/interactive approach, I believe that my success as a teacher thus far can be attributed to the fact that I continually make changes in my approach to teaching students based on ideas from faculty and students. This approach allows me to maintain a high standard of teaching while at the same time ensuring that students are being taught in the most effective manner.

A teaching philosophy which incorporates these ideas allows students to build an integrated foundation of knowledge, rather than a collection of facts. Perhaps most importantly, this foundation provides them with the base for a lifetime of learning.

Courses Taught**Undergraduate**

Fall 1997	Quantitative Analysis and Laboratory, 4 credit hours
Spring 1998	Quantitative Analysis and Laboratory, 4 credit hours
Spring 1999	Quantitative Analysis and Laboratory, 4 credit hours
Fall 1999	Quantitative Analysis and Laboratory, 4 credit hours
Fall 2000	Instrumental Analysis, 3 credit hours
Spring 2001	Quantitative Analysis and Laboratory, 4 credit hours
Fall 2001	Instrumental Analysis, 3 credit hours
Fall 2001	Instrumental Analysis Laboratory, 1 credit hour (developed proteomics laboratory experiment)

Graduate

Fall 1998	Mass Spectrometry in the Life Sciences, 3 credit hours
Spring 2002	Mass Spectrometry: Instrumentation, 1.5 credit hours
Spring 2002	Mass Spectrometry: Genomics, Proteomics, and Bioinformatics, 1.5 credit hours
Fall 2003	CME Course, Genomics in Clinical Practice, Genetic Testing: Past, Present & Future, Title: Beyond Genomics: The Promise of Proteomics, 1 credit hour
Spring 2004	Proteomics, Tumor Biology Program, Mayo Clinic College of Medicine.
Fall 2005	Biological Mass Spectrometry, 3 credit hours
Spring 2005	Proteomics, 3 credit hours
Fall 2006	Biological Mass Spectrometry, 3 credit hours
Spring 2007	Proteomics, 3 credit hours
Fall 2007	Biological Mass Spectrometry, 3 credit hours
Spring 2008	Proteomics, 3 credit hours
Fall 2008	Biological Mass Spectrometry, 3 credit hours
Spring 2009	Proteomics, 2 Credit Hours, Laboratory Intensive (Taught in Biotechnology Program at NCSU)
Fall 2009	Biological Mass Spectrometry, 3 credit hours
Spring 2010	Proteomics, 2 Credit Hours, Laboratory Intensive (Taught in Biotechnology Program at NCSU)

Students Mentored**HIGH SCHOOL**

Mentor, Gifted and Talented Education Program, Rochester Public Schools, Rochester, MN 2003-2004, Student: Stephanie Lovik.

UNDERGRADUATES

The following list of students actively participated in research projects in the group for which they received credit, Independent Study and/or were paid from external research grants.

Department of Chemistry – Virginia Commonwealth University

Heather O'Donahue h

Bobby Choochan (1998-99)

Tony Nelson (1998-99)
Rita Patel (1998-99)
Sarah Everidge (98-99)
Laura T. George (Recipient of the 2001-2002 David F. Ingrahm Scholarship)

Department of Chemistry – North Carolina State University

Kristina Toups (2005-2007). Recipient of the 2007 PLU Undergraduate Research Excellence Award. Graduate Student Chemistry, UNC Chapel Hill, 2007-present

Diana Saggese (2005-2008). Recipient of a 2006-2007 North Carolina State University Undergraduate Research Award, Graduate Student Chemistry, York University, 2008-present

Ashley Chadwick (2006-2007). Information Technology, College of Engineering, North Carolina State University, 2007-2009. Analytical Chemist I, Eisai Inc., RTP, NC 2009-present.

Coral Capo (Summer 2006) NSF-AGEP Student from University of Puerto Rico

Corey Meadows (Summer 2007) NSF-REU Student, Graduate Student in Chemistry, University of California-Berkeley, 2008-present.

Yashira Negrón (Summer 2009) NSF-AGEP Student from University of Puerto Rico

Anna Courie (2009-2010)

M.S. STUDENTS

Department of Chemistry – Virginia Commonwealth University

Eric F. Gordon, VCU Department of Chemistry, 2000. Currently a research scientist at Abbott Laboratories, Chicago, Illinois.

Jason W. Flora, VCU Department of Chemistry, 2000. Applied for Ph.D. program at VCU and continued his research.

Jennifer Frahm, VCU Department of Chemistry, 2004, B.S. Chemistry, Maryland, 2001.

Angelito Nepomuceno. VCU Department of Chemistry, 2004, B.S. Chemistry, Stetson University, 2000. Research Scientist, FTMS Systems, Varian, Inc.

Department of Chemistry – North Carolina State University

None to date.

Ph.D. STUDENTS

Department of Chemistry – Virginia Commonwealth University

James C. Hannis, Ph.D., 2001. Recipient of the American Chemical Society Division of Analytical Chemistry Graduate Student Fellowship (Summer 1999), sponsored by the Society of Analytical Chemistry of Pittsburgh, a Mary E. Kapp Graduate Student Fellowship (Spring 2000) and a University Fellowship (2000-2001). Currently at Ibis Pharmaceuticals, Carlsbad, CA.

Jason W. Flora, Ph.D., 2002, VCU Department of Chemistry. B.S. Chemistry, Hampden-Sydney, 1996. Currently Head of Proteomics at Altria Group, Inc., Richmond, Virginia.

Allison P. Null, Ph.D. 2003, VCU Department of Chemistry. B.S. Biology, University of Virginia, 1995. Recipient of a travel grant, sponsored by the National Institutes of Health, to attend Summer Institute in Statistical Genetics. Recipient of the American Chemical Society Division of Analytical Chemistry Graduate Student Fellowship (Summer 2002) sponsored by the Society of Analytical Chemists of Pittsburgh). Currently, Postdoctoral Fellow, National Institutes Environmental Health and Safety, RTP, NC.

Department of Chemistry – North Carolina State University

Jennifer Frahm, B.S. Chemistry, Maryland, 2001; M.S. Chemistry, Virginia Commonwealth University. Ph.D., North Carolina State University, 2007. Currently: NIH, NIMH Institutional NRSA Postdoctoral Training Fellowship, University of North Carolina-Chapel Hill, 2007-2009.

Michael Bereman, Ph.D. 2009, North Carolina State University, B.S. Chemistry, North Carolina State University, 2004. Recipient of the 2007-2008 Glaxo Smith-Kline Fellowship. NIH Postdoctoral Fellow, Department of Genome Sciences, University of Washington, 2009-present)

Keith Williams, Ph.D. 2009, North Carolina State University, B.S. Chemistry, Hampden-Sydney, 2005. Recipient of the American Chemical Society Division of Analytical Chemistry Graduate 9-Month Fellowship (2008-2009) sponsored by Merck and Co.). Research Scientist, Exxon, Dallas, Texas, 2009-present.

Robert Dixon, Ph.D. 2009, North Carolina State University, B.S. Chemical Engineering, North Carolina State University, 2005. DOE Post-Doctoral Fellow, Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, WA, 2009-present.

Jason Sampson, Ph.D. 2009, North Carolina State University, B.S. Chemistry, University of North Carolina-Greensboro, 2005. Postdoctoral Fellow, NIEHS, RTP, NC, 2009-present.

Tim Collier, Current Ph.D. student, B.S. Chemistry, North Carolina State University, 2006. Recipient of a NIH Predoctoral Fellowship in Biotechnology (2007-2009).

Genna Andrews, Current Ph.D. student, B.S. Chemistry, John Carroll University, 2007. Recipient of a NIH Predoctoral Fellowship in Biotechnology (2009-2010).

Chris Shuford, Current Ph.D. student, B.S. Chemistry, Longwood University, 2007. Recipient of a NIH Predoctoral Fellowship in Biotechnology (2008-2010).

POSTDOCTORAL FELLOWS/VISITING SCIENTISTS

Adam Hawkrigde, Ph.D. Research Associate (2003-2005) Biomedical Mass Spectrometry, Mayo Clinic College of Medicine, Postdoctoral Fellowship (2000-2003) Analytical Chemistry, University of Arizona, Tucson, AZ. Ph.D. (2000) Analytical Chemistry, SUNY at Buffalo, Buffalo, NY. B.S., (1996) Chemistry, Virginia Tech, Blacksburg, VA.

Yuko Ogata, Ph.D. (2004-2005), Ph.D. Analytical Chemistry, University of Washington, Seattle, 2004. B.S., Environmental Toxicology, December 1995, University of California, Davis, CA, Recipient Berklhammer book award, University of Washington, 2002. Currently Research Scientist, Seattle Biomedical Research Institute.

Taufika Williams, Ph.D. (2006-2008), Kenan Institute North Carolina Biotechnology Center Postdoctoral Fellow, 2006-2008. Ph.D., Analytical Chemistry, University of Kentucky, 2005. M.S., Analytical Chemistry, Purdue University 2002, BA, Chemistry and Mathematics, Transylvania University, 1998. Currently, Director, Mass Spectrometry Facility, North Carolina State University.

RESEARCH PROFESSORS

Adam Hawkrigde, Ph.D. (2005-present), Research Associate (2003-2005) Proteomics, Mayo Clinic College of Medicine, Rochester, MN. Postdoctoral Fellowship (2000-2003) Analytical Chemistry, University of Arizona, Tucson, AZ. Ph.D. (2000) Analytical Chemistry, SUNY at Buffalo, Buffalo, NY. B.S., (1996) Chemistry, Virginia Tech, Blacksburg, VA.

Taufika Williams, Ph.D. (2008), Research Assistant Professor. Kenan Institute North Carolina Biotechnology Center Postdoctoral Fellow, 2006-2008. Ph.D., Analytical Chemistry, University of Kentucky, 2005. M.S., Analytical Chemistry, Purdue University 2002, BA, Chemistry and Mathematics, Transylvania University, 1998. Currently, Director, Mass Spectrometry Facility, North Carolina State University.

GRADUATE STUDENT COMMITTEES (year degree awarded)***Virginia Commonwealth University***

Shuguang Hou, Ph.D., Pharmaceutics, VCU, **2001**
Andrew Hall, M.S., Chemistry, VCU, **2000**
Melissa Rhoten, Ph.D. Chemistry, VCU, **1999**
Steven Blankenship, M.S., Physics, VCU, **1999**

Mayo Clinic College of Medicine

Baolin Wu, Ph.D., Biostatistics, Yale University, **2004**

North Carolina State University

Sam Jenkins, Ph.D. Candidate, Analytical Chemistry

Qiang Liu, Ph.D., Analytical Chemistry, **2009**

Ryan Georgianna, Ph.D., Functional Genomics, **2009**

Wesleigh Edwards, Ph.D. Candidate, Bio-organic Chemistry

Amel Ahmed Ganawi, M.S., Analytical Chemistry, **2007**

Fred Jaeger, M.S., Analytical Chemistry, **2008**

ClarLynda Williams-DeVane, Ph.D., Bioinformatics, **2008** (Committee Chair)

Steven Bischoff, Ph.D. Candidate, Veterinary Medicine, **current**

Eric Tucker, Ph.D. Candidate, Organic Chemistry, **current**

Edward D'Antonio, Ph.D. Candidate, Analytical Chemistry, **current**

Amarnatha Sarma Potturi, M.S. Candidate, Mechanical and Aerospace Engineering, **current**

Erkkol Ilari Filpponen, Ph.D. 2009, Wood and Paper Science, North Carolina State University.

LEADERSHIP PHILISOPHY, CAREER SYNOPSIS, AND FUNDING RECORD**Leadership Philosophy**

My leadership experience is compromised of learning from mentors, working with institutional leadership, reading, and experience. Leadership in science is different than other sectors of society because it is very difficult to predict outcomes of experiments or how long they will require. In this sense, leading a scientific center or department is challenging because of this ever-changing landscape as new results, and therefore new directions emerge. Moreover, not only are new results being generated within a center or department, they have to be put in the context of results being presented and published on a large global research enterprise.

The converse of this is that one cannot lead a scientific research center or department without having accountability. The cornerstone of my leadership philosophy is a strong balance between creativity, aggressive scientific inquiry, and accountability. This is based on constant edification of progress in the field on a global scale, strategic short-term and long-term planning, objective and quantitative evaluation of pre-determined milestones, forming a diverse and strong research team, constant integration of scientific goals across multiple disciplines, and appointing key team leaders to ensure effective communication. Scientific inquiry that results in significant impact requires a strong commitment to people and trusting the carefully crafted strategic plan as opposed to changing directions too often; the latter causes inherent instability in a research center or department and this model is actually a true sign that the plan is solely “follow-up results reported from other groups” rather than “lead the scientific community by introducing innovative ways of thinking about the problem”. The reality is both are necessary with a healthy balance between the two. Finally, one has to ensure that state-of-the-art technologies are available for the research without being a “beta test site”. In other words, state-of-the-art instrumentation but only after the technology has proven itself to a reasonable degree.

Effective leadership is about understanding and educating people from different disciplines. I have always taken pride in my ability to work well with others from a diverse range of backgrounds in an open, intelligent, and honest fashion. I respect other people’s opinion and take them into account in a thoughtful manner while still being willing to make hard decisions when necessary. Building a strong center or department requires building trust and gaining respect of the team members (e.g., faculty) as well as the upper administration. If that can be established, fruitful science can be accomplished. In fact, significant impact is when truly inter-disciplinary research is not only encouraged but is central to the strategic plan. This is not a new concept. In 1793, A.L. Lavoisier said:

“Most of the work still to be done in science and the useful arts is precisely that which needs the knowledge and cooperation of many scientists . . . that is why it is necessary for scientists and technologists to meet . . . even in those branches of knowledge which seem to have least relation and connection with one another.”

My leadership philosophy is based on this premise and recognizing that making significant scientific discoveries requires bringing together scientists with expertise in multiple fields and forming and refining a strategic plan that promotes synergy rather than competition.

Career Synopsis

I commenced my graduate studies in the Surface Science Center (SSC) at the University of Pittsburgh in 1990 working under the auspices of Professor David M. Hercules. I was intrigued by the vast array of chemical instrumentation within the SSC but wanted to apply them to study biological problems. Professor Hercules supported my curiosity and allowed me to develop collaborations with the University of Pittsburgh Medical Center (UPMC). This launched my foray into biological analytical chemistry particularly directed at the quantification and immunosuppressants and their metabolism. It provided me with great opportunities and while it was difficult research most of the time, because I was impassioned by this line of research, my drive was intense. In 1991, I read a *Science* paper by Professor John Fenn (2002 Nobel Laureate in Chemistry) on electrospray ionization (ESI). I was fascinated by this new ionization source but I could not pursue it at the time since the SSC did not have suitable instrumentation.

In 1994 I knew I had to pursue postdoctoral studies in a world-renowned laboratory in contemporary biological mass spectrometry in which ESI was being developed. I was fortunate to be able to pursue my research interests in this area and in 1995, I joined the group of Dr. Richard D. Smith as a Department of Energy Postdoctoral Fellow in the Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory in Richland, WA. My project was to develop ESI for the analysis and characterization of large DNA molecules. It became quite clear that I did not speak the language of ESI, nucleic acids, or Fourier transform mass spectrometry. I had a lot to learn and was very privileged to work with such a talented group of scientists that truly helped me shape my future. Nearly 20 publications later, I was ready to seek my first academic position and in 1996, I started the application process, one of which was submitted to the Department of Chemistry, Virginia Commonwealth University in Richmond, VA where Professor John Fenn had recently relocated!

In 1997 I moved to Richmond, VA and with an empty lab and new graduate students, I realized that I was still struggling with the language of nucleic acids, PCR, and Fourier transform mass spectrometry. There was no better teacher than me having to work side by side with graduate students. It was an exhilarating and highly educational experience and one that solidified by knowledge to a point at which I was finally on solid ground. In a span of 3 years time, my colleagues noted my drive in the laboratory, in the classroom and in service to the Department and I was honored with achieving early tenure. They also provided me with newly renovated laboratory space and funding for more advanced instrumentation. The leadership at VCU at that time was tremendous – I learned a lot from my Chair (Fred Hawkridge), my Dean (Steve Gottfredson) and even the President (Eugene Trani)! Two years later I received a phone call from the Mayo Clinic asking me if I would be interested in establishing a brand new effort in Proteomics. I kindly thanked them for calling and told them I was not interested. Two weeks later, they called back and asked if they could visit me in Virginia to talk about this opportunity in more detail. I agreed to that meeting – a meeting which marked the beginning of an entire new direction in my career. I then visited the Mayo Clinic for 3-days and I was so impressed with what they were offering – tremendous support to

build a 5000+ sq ft. laboratory – the Mayo Proteomics Research Center – with complete latitude to develop it with my vision; hence the name “Research Center”.

I moved to Rochester, MN in 2002 and started the process of putting this new laboratory in motion. I knew very little about proteins and after being there a year, a common joke I would say in my lectures “I can’t believe I am the Director of Proteomics for just last week I was told that proteins don’t have 5’ and 3’ ends!”. Of course it was not true but I did have a lot to learn about protein chemistry, disease, biomarkers, medicine, biostatistics, all while continuing to push technology forward and keep abreast of the mass spectrometry literature. It was a great challenge but there was so much to learn and I enjoyed each and every day as I continued to learn and grow as a scientist. I learned to speak so many “languages” at the Mayo Clinic and truly learned the art and science of collaboration. Unfortunately, after a few years, internal Mayo budgets had to be reduced for a number of reasons and Proteomics is expensive. Moreover, as clinicians “learned” more about Proteomics, they wanted me to engage in research to find biomarkers for disease. In 2005, we had a superb staff of 25 FTE and we were studying 18 different diseases all while providing about \$500,000 in service charge-outs each year. We did not have enough scientists or space to deliver and given financial constraints, the “Research Center” was being asked to turn into a “Service Center”. In other words, to remove the “Research” from the Center by not developing technology but rather just applying whatever was commercially available. While that certainly has merit without question, it seemed short-sighted to me. Furthermore, I had grants with my clinical collaborators in Ovarian Cancer and Heart Failure which did contain a high degree of innovation. I also had a grant from the W.M. Keck Foundation to develop and apply high-end instrumentation to unravel disease at the molecular level. I came to the realization that these three large projects were all I could really make significant contributions to. At about that time, I saw an advertisement from North Carolina State University that seemed to be written for me – so I applied.

In 2005 I moved to Raleigh, NC where I was appointed Professor of Chemistry. Importantly, Mayo Clinic was very generous and allowed me to take the W.M. Keck Laboratory to NCSU as well as fully supported my interest in pursuing ovarian cancer and congestive heart failure as my main scientific line of inquiries. My invaluable experience at the Mayo Clinic taught me that it is best to develop technology towards a specific human disease and to use that focus to make a difference in both basic and clinical science. Since my arrival at NCSU, we have continued the development of technology and have made significant advances in this regard. Moreover, we have carried out large-scale studies on samples from early-stage ovarian cancer patients. This is testament to the realization that in order to make progress on complex human diseases, one must focus on a single class of disease and develop technology, molecular and cell biology, bioinformatics, and bio-specimen repositories. This model of scientific inquiry has proven to be the most fruitful in terms of real contributions to the understanding of disease and something I have also found to be personally rewarding.

Funding Record

a. Current Peer-Reviewed Support

Source of Support:	National Institutes of Health
Grant Number:	R21CA134250

Principal Investigator: David C. Muddiman (co-PIs, Dow and Edwards)
 Title: Improved Cancer Biomarker Detection Using Novel Air Amplifier Designs in ESI-MS

Period of Support: 09/04/08-08/31/10
 Total Costs: \$346,802

Source of Support: National Science Foundation
 Grant Number: MCB-0918611
 Principal Investigator: Ralph Dean (co-PI, David C. Muddiman)
 Title: Global Proteome and Signal Pathway Phosphoproteome Dynamics During Appressorium Formation in the Rice Blast Fungus *Magnaporthe Oryzae*

Period of Support: 06/15/09-06/14/12
 Total Costs: \$529,420

Source of Support: National Institutes of Health
 Grant Number: RO1HL036634
 Principal Investigator: John C. Burnett, Jr. (co-PI, David C. Muddiman)
 Title: Cardiac Peptides in Cardiorenal Protection

Period of Support: 04/01/06-03/31/11
 Total Costs: \$305,867 (subcontract from Mayo Clinic College of Medicine)

Source of Support: National Cancer Institute
 Grant Number: K-25 Award
 Principal Investigator: Adam M. Hawkridge (Mentor: David C. Muddiman)
 Title: Comparative Proteomics Applied to the Avian Model of Ovarian Cancer

Period of Support: 07/01/07-06/30/12
 Total Costs: \$638,320

b. Pending Peer-Reviewed Support

Source of Support: National Science Foundation
 Principal Investigator: Mary Schweitzer (CoPI: David C. Muddiman)
 Title: Center for Analytical and Molecular Paleontology

Period of Support: 06/01/10-05/31/15
 Total Costs: \$24,423,423

Source of Support: National Institutes of Health
 Principal Investigator: David Muddiman (CoPIs: Ghashghaei and Murray)
 Title: Development and Application of New Ionization Methods for Biological Mass Spectrometry

Period of Support: 07/01/10-06/30/14
 Total Costs: \$687,263

c. Current and Pending Philanthropic Support

Current

None

Previous Support

Foundation: The William R. Kenan, Jr. Fund for Engineering, Technology & Science
 Steward: David C. Muddiman
 Title: Novel Technologies for Biomolecular Characterization
 Period of Support: 09-01-05 – 06-31-08
 Amount: \$135,000

Industrial Support: IonSpec Corporation
 Steward: David C. Muddiman
 Title: IonSpec Graduate Student Fellowship in Chemistry
 Period of Support: 12-01-05 – 11-31-06
 Amount: \$20,000

Benefactor: Eugene and Eva Lane
 Stewards: David C. Muddiman and David A. Ahlquist
 Title: Proteomic Discovery and Validation of Novel Stool Markers for Colorectal Cancer Screening
 Period of Support: 07-01-04 – 06-31-06
 Amount: \$400,000
 Note: Relinquished Interests in this Support in 2005 due to move to NCSU

Benefactor: Mr. James M. Kemper, Jr.
 David Woods Kemper Memorial Foundation
 Steward: David C. Muddiman
 Title: Launching of Our Bioinformatics Initiative
 Period of Support: 01-01-03 – 12-31-03
 Amount: \$50,000
 Note: Relinquished Interests in this Support in 2005 due to move to NCSU

Benefactor: Mr. James M. Kemper, Jr.
 David Woods Kemper Memorial Foundation
 Steward: David C. Muddiman
 Title: Bioinformatics for Biomarker and Therapeutic Target Discovery
 Period of Support: 12-01-04 – 11-31-08
 Amount: \$300,000
 Note: Relinquished Interests in this Support in 2005 due to move to NCSU

Benefactor: Ruan Family and the Ruan Charity Foundation
 Stewards: David C. Muddiman and Ronald C. Petersen
 Title: Proteomic Measurements to Advance our Understanding of the Neurosciences and Neurological Disorders
 Period of Support: 10-01-03 – 9-31-05
 Amount: \$250,000

Note: Relinquished Interests in this Support in 2005 due to move to NCSU

d. Grant History

Source of Support:	North Carolina State University
Grant Number:	Start-Up Funding
Principal Investigator:	David C. Muddiman
Title:	Biological Mass Spectrometry Measurement Laboratory
Period of Support:	07/01/05-06/31/08
Total Costs:	\$1,350,000 plus \$200,000 in renovation costs
Source of Support:	National Cancer Institute
Grant Number:	R33 CA105295-1
Principal Investigator:	David C. Muddiman
Title:	Ovarian Cancer Screening Using Comprehensive Proteomics
Period of Support:	05/17/04-05/16/09
Total Costs:	\$1,485,782
Source of Support:	W.M. Keck Foundation
Principal Investigator:	David C. Muddiman
Title:	Development of a Fourier Transform Ion Cyclotron Resonance Mass Spectrometer for the High Sensitivity and Accurate Molecular Characterization of Proteins and DNA Relevant to Human Health and Disease
Period of Support:	01/01/03 – 01/31/08
Total Costs:	\$1,350,000
Source of Support:	Phillip Morris USA
Grant Number:	None
Principal Investigator:	David C. Muddiman
Title:	Development and Implementation of Quantitative LC-MS/MS Strategies for Measuring Endogenous Levels of Human C-reactive Protein in Human Plasma
Period of Support:	05/15/07-09/30/08
Total Costs:	\$167,000
Source of Support:	North Carolina Biotechnology Center and the Kenan Institute
Principal Investigator:	David C. Muddiman
Title:	Development, Implementation and Validation of Novel Bioanalytical Technologies: Impacting Human Health through an Industrial and Academic Partnership
Period of Support:	02/01/06-01/31/08
Total Costs:	\$160,000
Source of Support:	North Carolina Biotechnology Center
Principal Investigator:	David C. Muddiman

Title: Acquisition of an Accurate Mass Electrospray Ionization Time-of-Flight Mass Spectrometer with the Versatility and Throughput to Support Diverse Research Programs and Education

Period of Support 02/01/07-01/31/08

Total Costs: \$187,500

Source of Support: National Institutes of Health (NIAID)

Grant Number: R21 AI58208-1

Principal Investigator: Douglas Plager (Co-PI: David C. Muddiman)

Title: Global Gene Expression in Chronic Rhinosinusitis

Period of Support 12/01/03-11/30/05

Total Direct Costs: \$300,000

Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: Lustgarten Foundation

Principal Investigator: Janet Olson (Co-PI: David C. Muddiman)

Title: Identification of Early Stage Pancreatic Cancer Biomarkers using LC-dual ESI-FT-ICR Mass Spectrometry

Period of Support: 08/01/04 – 07/31/06

Total Direct Costs: \$250,000

Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: National Institutes of Health (NCRR)

Grant Number: Pancreatic SPORE

Principal Investigator: Gloria Petersen

Title: Proteomics Core

Period of Support: 08/01/04-06/30/08

Total Direct Costs: \$500,000

Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: National Institutes of Health

Grant Number: DK 70179

Principal Investigator: Sree Nair (Co-PI: David C. Muddiman)

Title: Plasma Protein Synthesis and Abundance in T1 Diabetics

Period of Support: 10/01/04-09/30/08

Total Direct Costs: \$700,000

Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: National Institutes of Health

Grant Number: 1 R01DK065236-01

Principal Investigator: Donald J. Tindall (Co-PI: David C. Muddiman)

Title: Androgenic Inactivation of FKHR in Prostate Cancer

Period of Support: 07-01-03 – 06-30-07

Total Direct Costs: \$140,000

Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: NIH

Grant Number: 1 K25 CA102148-1

Principal Investigator: David Barnidge (Mentor: David C. Muddiman)
 Title: B-CLL Proteins Quantified by Mass Spectrometry
 Period of Support: 07/01/03-06/30/08
 Total Costs: \$646,545
 Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: National Institutes of Health
 Grant Number: AG04875
 Principal Investigator: Thomas Spelsberg (Co-PI: David C. Muddiman)
 Title: Action of estrogen receptor coregulators in osteoblasts
 Period of Support: 07/01/04-06/30/08
 Total Direct Costs: \$125,000
 Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: National Institutes of Health (NCRR)
 Grant Number: 2 P30 CA15083-30
 Principal Investigator: Franklyn G. Prendergast
 Title: Mayo Comprehensive Cancer Center Grant
 Period of Support: 07/01/04-06/30/08
 Total Direct Costs: \$600,000
 Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: National Institutes of Health
 Principal Investigator: Cynthia McMurray (Co-PI: David C. Muddiman)
 Title: Full-Length Pure HD Protein: Defining Toxic Properties
 Period of Support: 12/01/03-11/30/08
 Total Direct Costs: \$100,000
 Note: Relinquished Interests in this Grant in 2005 due to move to NCSU

Source of Support: Department of Laboratory Medicine and Pathology (Internal)
 Principle Investigator: David C. Muddiman
 Title: Translation of Protein Tests into Clinical Diagnostics
 Period of Support: 01/01/03-present
 Total Direct Costs: \$125,000 annually
 Note: Relinquished Interests in this Support in 2005 due to move to NCSU

Source of Support: Hematology Malignancies Foundation
 Principal Investigator: David Muddiman, Co-PI, Steven Zeldenrust
 Title: Top-Down Comprehensive Proteomic Characterization of Familial Amyloidosis
 Period of Support: 07/01/03-06/30/05
 Total Direct Costs: \$135,558

Source of Support: National Human Genome Research Institute
 Grant Number: R01 HG02159-01
 Principal Investigator: David C. Muddiman
 Title: Rapid and Accurate Genotyping of Short Tandem Repeat Loci by Electrospray Ionization Mass Spectrometry

Period of Support: 06-01-00 – 05-31-04
Total Direct Costs: \$1,003,019 (which includes a \$118,000 minority supplement, plus \$66,950 capital equipment supplement)

Source of Support: National Science Foundation
Proposal Number: 0091718
Principal Investigator: Fred M. Hawkrige (co-PI: David C. Muddiman)
Title: Acquisition of an Electrospray Ionization Quadrupole Time-of-Flight Mass Spectrometer for Research and Education

Period of Support: 02-01-01 – 01-31-02
Total Direct Costs: \$186,815

Source of Support: Massey Cancer Center Pilot Project
Principal Investigator: Swati Deb (co-PI D.C. Muddiman)
Title: Normal and oncogenic interactions of the oncoprotein MDM2
Period of Support: 01-01-02 – 12-31-03
Total Direct Costs: \$30,000

Source of Support: Merck Genome Research Institute
Grant Number: 31
Principal Investigator: David C. Muddiman
Title: Development of a Rapid and Accurate Method for Genetic Mutation Screening Based on Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
Period of Support: 11-01-97 – 06-30-00
Total Direct Costs: \$240,000

Source of Support: American Society for Mass Spectrometry Research Award
Principal Investigator: David C. Muddiman
Title: Understanding and Tailoring the Gas-Phase Fragmentation Reactions of DNA Sequences with a Repeating Motif
Period of Support: 06-16-99 – 06-15-00
Total Direct Costs: \$10,000

Source of Support: Jeffress Memorial Trust
Grant Number: J-433
Principal Investigator: David C. Muddiman
Title: Development of Analytical Electrospray Ionization Fourier Transform Mass Spectrometry for the Quantification and Structural Elucidation of Biological Materials
Period of Support: 01-01-98 – 06-30-00
Total Direct Costs: \$35,000

Source of Support: Virginia Commonwealth University Faculty Grant-in-Aid
Principal Investigator: David C. Muddiman
Title: Development of Novel Microscale Separation-Purification Methods for the Analysis of DNA by Electrospray Ionization Mass Spectrometry”

Period of Support: 01-01-98 – 12-31-99
Total Direct Costs: \$5,000

Source of Support: The American Cancer Society
Grant Number: IN-105 (ACS Award to VCU)
Principal Investigator: David C. Muddiman
Title: Development of Mass Spectrometry as a Structural Biology Tool to Investigate Anti-Cancer Drug DNA Interactions

Period of Support: 06-01-98 – 5-31-99
Total Direct Costs: \$7,000

Source of Support: Virginia Commonwealth University Mary E. Kapp Fund (Start-up Package)
Principal Investigator: David C. Muddiman
Title: Development of Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry for the Quantification and Structural Elucidation of Biological Molecules

Period of Support: 08-15-97 – 8-14-99
Total Direct Costs: \$416,000

COLLABORATORS (past and present)

H. Robert Bergen, Ph.D., Mayo Clinic College of Medicine
John C. Burnett, M.D., Mayo Clinic College of Medicine
Peter Carr, University of Minnesota
Graham Cooks, Purdue University
William A. Cliby, M.D., Mayo Clinic College of Medicine
Andrei Federov, Georgia Institute of Technology
Facundo Fernandez, Georgia Institute of Technology
Larry Gold, SomaLogic, Boulder, CO
Milton Lee, Brigham Young University
Carlito Lebrilla, UC Davis
Michael MacCoss, University of Washington
Alan Marshall, Florida State University
Scott McLuckey, Purdue University
Lincoln Potter, University of Minnesota
Peter Sorenson, University of Minnesota
Peter J. Stang, University of Utah
John Yates, Scripps Research Institute

PLENARY/KEYNOTE LECTURES

1. The Utility of FT-ICR Mass Spectrometry in the Clinical Domain: From Discovery to Targeted Proteomics
David C. Muddiman
Plenary Lecture, Trapped Ion Meeting, Department of Chemistry, Oxford University, London, England, 2005
2. Clinical Proteomics for Disease Diagnostics and Treatment
David C. Muddiman
Plenary Special Lecture, Korean Academy of Asthma, Allergy, and Clinical Immunology, Seoul, Korea, 2006
3. Discovery and Targeted Plasma Proteomics: Application to Ovarian Cancer and Cardiovascular Disease
David C. Muddiman
Keynote Lecture, Bascom Palmer Eye Institute, Evelyn F. and William L. McKnight Vision Research Center, University of Miami Miller School of Medicine, Miami, FL, 2006
4. Splitless nanoLC ESI-FTICR Mass Spectrometry in the Clinical Proteomics Arena – You Can Never Have Too Much Peak Capacity
David C. Muddiman
Keynote Lecture, 20th International Symposium on Microscale Bioseparations, Vancouver, Canada, 2007
5. Recent Advances in FT-ICR Mass Spectrometry Instrumentation
David C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007
6. Implementing nanoLC-MS/MS for Global and Targeted Clinical Biomarker Characterization
David C. Muddiman
Howard James Keynote Lecture, Triangle Chromatography Discussion Group, Raleigh, NC 2009

INVITED PRESENTATIONS

(reverse-chronological order)

165. US HUPO 2010
164. Proteomics and Glycomics Approaches to Elucidate Biomarkers for the Early Detection of Ovarian Cancer
David C. Muddiman
PittCon 2010, Orlando, Florida

163. Development and Application of Chemical and Instrumental Approaches Directed at Biomarker Discovery
David C. Muddiman
Department of Chemistry, Louisiana State University, Baton Rouge, LA 2009
162. Development and Application of Chemical and Instrumental Approaches Directed at Biomarker Discovery
David C. Muddiman
Department of Chemistry, George Washington University, Washington, DC 2009
161. Developing Novel Hybrid Ionization Sources Around the MALDESI Technology Platform
Adam M. Hawkridge and David C. Muddiman
Federation of Analytical Chemistry and Spectroscopy Societies, Louisville, KY 2009.
160. Mass Spectrometry-Based Biomarker Discovery: Towards a Global Proteome Index-of-Individuality
David C. Muddiman and Adam M. Hawkridge
Pharmaceutical and Biomedical Analysis, Orlando, FL 2009
159. The Development of an Aerodynamic Focusing Device, the Air Amplifier, for Improved Biomarker Analyses by Mass Spectrometry
David C. Muddiman, R. Brent Dixon, Amarnatha S. Potturi, Dan Cassidy, Jack R. Edwards, Alex Sohn, Guillaume Robichaud, Thomas A. Dow
NCI IMAT Grantee Meeting, Bethesda, MD 2009
158. Rationale Ovarian Cancer Biomarker Discovery: The Importance of Longitudinal Experimental Designs
David C. Muddiman
ADAPT Congress, Washington, DC 2009
157. Cancer Biomarker Discovery and Quantification using Mass Spectrometry
David C. Muddiman
Precision Engineering Center, Monteith Engineering Research Center, North Carolina State University, Raleigh, NC 2009
156. Development and Application of Chemical and Instrumental Approaches Directed at Biomarker Discovery
David C. Muddiman
Department of Chemical and Biomolecular Engineering, North Carolina State University, Raleigh, NC 2009
155. Ambient Ionization Methods Coupled to FTMS for Direct Analysis and Imaging Applications
David C. Muddiman
Center for Analytical and Instrumentation Development, Purdue University, West Lafayette, IN 2009
154. Development of Atmospheric Pressure Ionization Sources Coupled to FT-ICR Mass

Spectrometry for the Characterization of Biological Molecules
David C. Muddiman, Jason S. Sampson, K.K. Murray, R.B. Dixon
7th North American FT MS Conference, Key West, FL, 2009

153. Development and Application of FT-ICR Mass Spectrometry for Proteomics and Glycomics Research
BASF, The Chemical Company, Research Triangle Park, NC 2009
152. Aligning Chemistry and High End Mass Spectrometry with Important Clinical Problems: Building a Strong Foundation Based on Interdisciplinary Collaborations
David C. Muddiman
Department of Chemistry, UNC Chapel Hill, Chapel Hill, NC 2009
151. Integration of Engineering, Chemistry, and Medicine: Progress Towards the Molecular Characterization of Cancer
David C. Muddiman
Department of Chemistry, NC A & T University, Greensboro, NC 2009
150. Innovative Ionization Sources for Imaging Mass Spectrometry
David C. Muddiman
Department of Chemistry, Georgia Institute of Technology, Atlanta, GA 2008
149. A Combinatorial Approach: The Use of MALDI-MS and Nano LC-MS for Glycan Biomarker Discovery
David C. Muddiman
Diosynth Biotechnology, Cary, NC 2008
148. New Ionization Sources for Biological Mass Spectrometry
David C. Muddiman
Asilomar Conference on Mass Spectrometry, New Methods, Instrumentation, and Applications of Ion Traps, Pacific Grove, CA 2008
147. Time-of-Flight Mass Analyzers: Single-Ion Counting versus ADC Detection
David C. Muddiman
US LC/MS Innovations Seminar Tour, Agilent Technologies, Durham, NC 2008
146. Innovative Technology Development Directed at the Elucidation of Biomarkers for the Detection of Early-State Ovarian Cancer
Taufika I. Williams, Michael S. Bereman, D. Keith Williams, Kimberly K. Kalli, William A. Cliby and David C. Muddiman
National Cancer Institute, Innovative Molecular Analysis Technologies, Cambridge, MA 2008
145. A Combinatorial Approach: The Use of MALDI-MS and Nano LC-MS for Glycan Biomarker Discovery
Taufika Islam Williams, Michael S. Bereman, Kimberly A. Kalli, William A. Cliby and David C. Muddiman
Sixth Annual Protein Biomarkers Conference, Philadelphia, PA 2008

144. Driving Research with a Multidisciplinary Approach
David C. Muddiman
Bioinformatics and Bioengineering Summer Institute, Virginia Commonwealth University, Richmond, VA 2008
143. Glycan Profiling in Plasma: Fundamentals and Applications to Ovarian Cancer
Taufika Islam Williams and David C. Muddiman
The Pittsburgh Conference, New Orleans, LA, 2008
142. Mass Spectrometry Detection Techniques Available for Qualitative and Quantitative Assays - Small vs. Large Molecules
David C. Muddiman
American Association of Pharmaceutical Scientists, San Diego, CA, 2007
141. Fundamentals and Applications of DESI and MALDESI Coupled to FT-ICR-MS
David C. Muddiman
Workshop on The Art of Open Air Ionization on Surfaces, Philadelphia, PA, November 8-9, 2007
140. Plasma Biomarker Discovery and Analysis using FT-ICR Mass Spectrometry
David C. Muddiman, Adam Hawkrige, Taufika I. Williams, William Cliby, and John Burnett
Federation of Analytical Chemistry and Spectroscopy Societies Memphis, TN 2007
139. Development of Hybrid Atmospheric Ionization Sources for Direct Analysis of Macromolecules by FT-ICR-MS
David C. Muddiman, Adam Hawkrige, Jason S. Sampson, Michael S. Bereman and R. Brent Dixon
Federation of Analytical Chemistry and Spectroscopy Societies Memphis, TN 2007
138. New Mass Spectrometric Proteomic Technologies
David C. Muddiman
Metabolomics and Proteomics Seminar Series, Department of Biochemistry, University of Minnesota, St. Paul, MN, 2007
137. Advancing Quantitative Proteomics Technologies
David C. Muddiman
Minnesota Mass Spectrometry Discussion Group, Minneapolis, MN 2007
136. Chemical and Mass Spectrometry Advances for Improved Clinical Proteomic Measurements
David C. Muddiman
Department of Chemistry, University of Michigan, Ann Arbor, MI, 2007
135. nanoRP-HPLC and SCX-nanoRP-HPLC coupled to FT-ICR Mass Spectrometry to Effectively Address Complex Biological Mixtures

David C. Muddiman

Triangle Chromatography Discussion Group Symposium, Raleigh, NC, 2007

134. Statistical Issues in Mass Spectrometry Based Proteomics
David C. Muddiman
Department of Statistics, North Carolina State University, Raleigh, NC, 2007
133. Innovations and Applications of the LTQ-FT in the Biological Arena
David C. Muddiman
ThermoElectron Users Meeting, Cincinnati, OH 2007
132. Innovations and Applications of the LTQ-FT in the Biological Arena
David C. Muddiman
ThermoElectron Users Meeting, Chicago, IL 2007
131. Novel Chemical and Instrumental Approaches to Effectively Address Clinical Proteomic Problems
David C. Muddiman
Department of Chemistry, Vanderbilt University, Nashville, TN 2007
130. Innovations in Ion Sources for Biological FT-ICR Mass Spectrometry
David C. Muddiman
6th North American FT-ICR MS Conference, Lake Tahoe, CA, 2007
129. Innovations and Applications of the LTQ-FT in the Biological Arena
David C. Muddiman
ThermoElectron Users Meeting, Lake Tahoe, CA 2007
128. Effectively Addressing Clinical Proteomic Problems using Novel Chemical and Instrumental Approaches
David C. Muddiman
Department of Pharmaceutics, Virginia Commonwealth University, Richmond, VA 2007
127. Traps, TOF's and Triples Applied to Global and Targeted Clinical Proteomics
David C. Muddiman
Divisions of Molecular Pharmaceutics and Medicinal Chemistry, University of North Carolina-Chapel Hill, Chapel Hill, NC 2006
126. Selective Chemistry and Advancing Mass Spectrometry Instrumentation to Effectively Approach Challenging Clinical Questions
David C. Muddiman and Adam M. Hawkrige
Department of Chemistry, Georgia Institute of Technology, Atlanta, GA 2006
125. Novel Chemical and Instrumental Approaches Coupled to ESI-FT-ICR Mass Spectrometry to Effectively Address Proteomics Questions
David C. Muddiman
Department of Genome Sciences, University of Washington, Seattle, WA 2006

124. Development of nLC-dualESI-FT-ICR MS and its Applications in Cancer and Cardiovascular Plasma Proteomics
David C. Muddiman and Adam M. Hawkrige
*Federation of Analytical Chemistry and Spectroscopy Societies
Lake Buena Vista, FL 2006*
123. A Primer and Update on the Current State of Large Molecule Quantification
David C. Muddiman
*Applied Pharmaceutical Analysis, The Boston Society for Advanced Therapeutics,
Boston, MA 2006*
122. FT-ICR Mass Spectrometry: Putting a High Resolving Power Spin on Protein Identification and Quantification
David C. Muddiman, Adam H. Hawkrige, Kenneth L. Johnson, and H. Robert Bergen III
231st National American Chemical Society Meeting, Symposium Honoring Richard Caprioli, Recipient of the 2006 Field and Franklin Award, Atlanta, GA, 2006
121. Putting a High Resolving Power Spin on Proteomics in the Clinical Domain
David C. Muddiman
ThermoElectron Proteomics Series, Atlanta, GA 2005
120. Fourier Transform Ion Cyclotron Resonance Mass Spectrometry: Putting a High Resolving Power Spin on Macromolecular Ions
David C. Muddiman
Department of Chemistry, East Carolina University, Greenville, NC 2005
119. Putting a High Resolving Power Spin on Proteomics in the Clinical Domain
David C. Muddiman
ThermoElectron Proteomics Series, Rochester, NY 2005
118. Protein Biomarker Discovery: A Tale of Technologies on a Journey Worth Making
David C. Muddiman
Department of Chemistry and Biochemistry, University of Maryland, College Park, MD 2005
117. Protein Biomarker Discovery in Plasma Based on FT-ICR Mass Spectrometry
David C. Muddiman
Department of Chemistry, University of Georgia, Athens, GA 2005
116. Ovarian Cancer Biomarker Discovery: A Tale of Technologies
David C. Muddiman
AACR/NCI/EORTC International Conference "Molecular Targets and Cancer Therapeutics: Discovery, Biology and Clinical Applications, Philadelphia, PA, 2005
115. Aligning High-End Mass Spectrometry with the Clinical Laboratory: Baby Steps

on a Journey Worth Making

David C. Muddiman

Mass Spectrometry in the Clinical Lab: Matching Technology to Application, American Association for Clinical Chemistry, Orlando, FL 2005

114. Identification and Relative and Absolute Quantification of Proteins using FT-ICR Mass Spectrometry
David C. Muddiman
Korean Research Institute of Standards and Technology, Taejon, Korea, 2005
113. Traps, Triples and TOF's in the Clinical Domain: Proteomics in the Medical Field
David C. Muddiman
Seoul University National Hospital, Seoul, Korea, 2005
112. Traps, Triples and TOF's in the Clinical Domain: Proteomics in the Medical Field
David C. Muddiman
Inje University Sanggye Paik Hospital, Seoul, Korea, 2005
111. Implementation of nanoLC-FT-ICR Mass Spectrometry for Studying Circulating Forms of Brain Natriuretic Peptide in Congestive Heart Failure Patients
Adam M. Hawkrige, Denise M. Heublein, H. Robert Bergen III, John C. Burnett, Jr.,
David C. Muddiman
North American ICR Meeting, Key West, Florida, 2005
110. The Utility of FT-ICR Mass Spectrometry in the Clinical Domain: From Discovery to Targeted Proteomics
David C. Muddiman
Trapped Ion Meeting, Oxford University, London, England, 2005
109. Accurate Characterization of Nucleic Acids by FT-ICR Mass Spectrometry, LGC, Southwestern, England, 2005
108. Unraveling the Low Molecular Weight Serum and Plasma Proteome using LC- FT-ICR MS: The Search for Biomarkers Predictive for Early Stage Ovarian and Pancreatic Cancer
David C. Muddiman, Adam H. Hawkrige, Kenneth L. Johnson, Ann L. Oberg, Christopher J. Mason, H. Robert Bergen III, William A. Cliby, Janet E. Olson
The Association of Biomolecular Resource Facilities, Savannah, GA, 2005
107. Development of a Robust Biomarker Discovery Platform Based on LC-FT-ICR Mass Spectrometry
David C. Muddiman
Department of Chemistry, University of Massachusetts-Amherst, 2005
106. Protein Marker Discovery in Plasma and Serum: At the Bleeding Edge of Measurement Science
David C. Muddiman
Department of Chemistry, Oregon State University, Corvallis, Oregon, 2005

105. Clinical Proteomics: Making an Impact through the Chemistry Porthole and Building Diverse Research Teams
David C. Muddiman
Department of Chemistry, Carleton College, Northfield, Minnesota, 2005
104. The Challenges and Opportunities of Bringing Proteomics into the Clinical Laboratory
David C. Muddiman
Endocrine Research Group, St. Mary's Hospital, Rochester, MN, 2004
103. Proteomic Measurements based on FT-ICR Mass Spectrometry: Challenges and Opportunities
David C. Muddiman
Proteome Society Meeting, London, Ontario, 2004
102. Clinical Proteomics: At the Bleeding Edge of Measurement Science
David C. Muddiman
University of Western Ontario, London, Ontario, 2004
101. Mass Spectrometry Based Proteomics: From Discovery to Translation
David C. Muddiman
Lillehei Heart Institute, University of Minnesota, Minneapolis, MN, 2004
100. Targeted and Biomarker Discovery Proteomics using 1D and 2D LC FT-ICR Mass Spectrometry
David C. Muddiman
3M Corporation, Saint Paul, MN, 2004
99. The Role and Impact of 1 and 2D-LC FT-ICR Mass Spectrometry in the Clinical Arena: From Fundamentals to Applications
David C. Muddiman
Philip Morris, Richmond Virginia, 2004
98. Biomarker Discovery in Plasma and Serum: Establishment of a Powerful Platform based on High-Field Magnets
David C. Muddiman
Manfred W. Comfort Symposium, Radisson Hotel, Rochester, MN, 2004
97. Translation of Proteomic Discoveries from the Basic Science to the Clinical Laboratory: The Challenges and Opportunities
David C. Muddiman
Keynote Speaker, American Motility Society Annual Meeting, 2004
96. Biomarker Discovery using a nanoLC-dualESI FT-ICR Mass Spectrometry Platform
D.C. Muddiman
Protein Biomarkers 2004, Philadelphia, PA, 2004

95. An Integrated Biomarker Discovery Platform Based on nanoLC-dual-ESI-FT-ICR Mass Spectrometry
A.M. Hawkridge, C.J. Mason, K.L. Johnson, H.R. Bergen, and D.C. Muddiman
31st Annual Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Portland, OR, 2004
94. Shining a High Resolving Power Spin on Biological Macromolecules
D.C. Muddiman
Arthur F. Findeis Award Lecture, American Chemical Society, Philadelphia, PA 2004.
93. Detection of TTR Variants and Evaluation of siRNA in Mice as a Potential Therapy for Familial Amyloidosis
D.C. Muddiman
Amyloid Research Group, Mayo Clinic College of Medicine, Rochester, MN 2004
92. The Role of Modern Mass Spectrometry in 21st Century: Fundamental Developments and Emerging Applications
D.C. Muddiman
Young Mass Spectrometrists, American Society for Mass Spectrometry, Nashville, TN 2004
91. The Classical ER Transcriptional Pathway
T .C. Spelsberg, D.G. Monroe, F.J. Secreto, D.C. Muddiman, B.L. Riggs, S. Khosla
American Society for Bone and Mineral Research, Bethesda, Maryland, 2004
90. Biomarker Discovery using High Performance Mass Spectrometry
David C. Muddiman
Cambridge Healthtech Institute's Protein Biomarkers: HighEnd Mass Spectrometry, Philadelphia, PA, 2004.
89. The Challenges and Opportunities of Doing Proteomics in a Single Cell
David C. Muddiman
Cambridge Healthtech Institute's Eighth Annual Proteomics Meeting. Proteomics: Addressing Challenges in Proteomic Analysis, San Francisco, CA, 2004.
88. Comprehensive Proteomics: The Integration of High Performance Mass Spectrometry, Genomics and Bioinformatics to Improve Our Understanding of Disease
David C. Muddiman
J. Craig Venter Science Foundation Joint Technology Center, Rockville, MD, 2004.
87. Global and Targeted Proteomics using High Performance Mass Spectrometry
David C. Muddiman
Symposium on Genomic and Proteomic Approaches Toward the Understanding of Drug Addiction, Basic Research Center on Molecular and Cell Biology of Drug Abuse (MCBDA) at the University of Minnesota, Minneapolis, MN, 2004.

86. Proteomics at the Clinical Interface
David C. Muddiman
95th Annual Meeting of the Society of Neurological Surgeons, New Orleans, LA, 2004
85. High Field LC-ESI FT-ICR Mass Spectrometry: From Gas-Phase Ion Chemistry to Clinical Applications
David C. Muddiman
Southern Illinois University, Carbondale, IL, 2004
84. Biomarker Discovery: High Performance Mass Spectrometry
David C. Muddiman and Janet E. Olson
Pancreatic Cancer Annual SPORE Retreat, Mayo Clinic College of Medicine, Rochester, MN 2004.
83. Protein Characterization in Biological Fluids using High Performance Mass Spectrometry
David C. Muddiman
St. Olaf College, Northfield, MN, 2004
82. Nucleic Acid Analysis Using High Field FT-ICR Mass Spectrometry
David C. Muddiman
Keystone Symposium on Mass Spectrometry in Systems Biology, Santa Fe, NM, 2004
81. Clinical Proteomics by Multidimensional Chromatography Coupled with ESI FT-ICR Mass Spectrometry
David C. Muddiman
The Pittsburgh Conference (Pittcon 2004), Chicago, IL, 2004
80. Development of High Performance Mass Spectrometry to Address Complex Biological Problems
David C. Muddiman
University of St. Thomas, Minneapolis, MN, 2004.
79. LC-ESI-FT-ICR Mass Spectrometry: The Ultimate in Peak Capacity and Adaptability for Measuring Biological Molecules
David C. Muddiman
Department of Chemistry, University of Minnesota, Minneapolis, MN, 2004
78. Unraveling Biological Complexity with High Performance Mass Spectrometry
David C. Muddiman
Division of Gastroenterology and Hepatology, Mayo Clinic College of Medicine, 2004
77. MS-Based Proteomics: Instrumentation and Clinical Applications
David C. Muddiman
Resident Lecture Series, Mayo Clinic College of Medicine, 2003
76. Ovarian Cancer Biomarker Discovery using 1D and 2D LC-High Performance Mass Spectrometry
David C. Muddiman
Ovarian Cancer Research and Clinical Team, Mayo Clinic College of Medicine, 2003

75. Targeted and Discovery Proteomics using High Performance Mass Spectrometry
David C. Muddiman
Clinical Biochemistry and Immunology, Mayo Clinic College of Medicine, 2003
74. Clinical Proteomic Applications of LC-ESI-FT-ICR Mass Spectrometry
David C. Muddiman
Associated Regional and University Pathologists, Salt Lake City, Utah, 2003
73. Fundamentals and Biological Applications of ESI-FT-ICR Mass Spectrometry
David C. Muddiman
Brigham Young University, Provo, Utah, 2003
72. Multidimensional Chromatography ESI-FT-ICR Mass Spectrometry: The Ultimate Peak Capacity for Proteome Measurements
David C. Muddiman
The 35th Central Regional Meeting of the American Chemical Society, Pittsburgh, PA, 2003
71. Beyond Genomics: The Promise of Proteomics
David C. Muddiman
Genomics in Clinical Practice, Genetic Testing: Past, Present and Future, Mayo School of Continuing Medical Education, Rochester, MN, 2003
70. Comprehensive and Rational Ovarian Cancer Biomarker Discovery using High Performance Mass Spectrometry-Based Proteomics
David C. Muddiman
Women's Cancer 2003: Merging Science and Care, Mayo Clinic Cancer Center, Rochester, MN, 2003.
69. Targeted and Global Proteomics by 1D and 2D LC-FT-ICR Mass Spectrometry
David C. Muddiman
American Society for Bone and Mineral Research Annual Meeting, Minneapolis, MN, 2003
68. Clinical Proteomics using One and Two-Dimensional LC Coupled with High Field FT-ICR Mass Spectrometry
David C. Muddiman
Seminar at Medical College of Wisconsin, Milwaukee, WI, 2003
67. Proteomics FT-ICR Style: A Tribute to John Fenn's Invention
David C. Muddiman
Mary E. Kapp Lecturer, Virginia Commonwealth University, Richmond, VA, 2003
66. Electrospray Ionization Mass Spectrometry of Proteins
David C. Muddiman
Research Workshop, Wisconsin Symposium III, DNA Conference, Visiting Faculty Member, University of Wisconsin-Madison Medical School, Madison, WI, 2003

65. Electrospray Ionization Mass Spectrometry of Nucleic Acids: From DNA: Drug Binding to Genotyping
David C. Muddiman
Wisconsin Symposium III, DNA Conference, Visiting Faculty Member, University of Wisconsin-Madison Medical School, Madison, WI, **2003**
64. Comprehensive Proteomics in a Single Cell: Technology and Applications
David C. Muddiman
Minnesota Chromatography Forum, Minneapolis, MN, **2003**
63. Genomics and Comprehensive Proteomics in a Single Cell: Technology and Applications
David C. Muddiman
Eastern Tennessee Mass Spectrometry Discussion Group, Knoxville, TN, **2003**
62. Characterization of Transthyretin by LC-ESI-FT-ICR Mass Spectrometry
David C. Muddiman
University of Tennessee at Knoxville, Knoxville, TN, **2003**
61. Comprehensive Proteomics in a Single Cell”
David C. Muddiman
Mayo Clinic Genetics Society, Mayo Clinic, **2003**
60. Genomic and Proteomic Measurements in a Single Cell
David C. Muddiman
4th North American ICR Conference, San Francisco, CA. **2003**
59. Comprehensive Proteomics Using 2DLC-ESI-FT-ICR
David C. Muddiman
Seminar at Mayo Clinic Jacksonville, Jacksonville, FL, **2003**
58. Comprehensive Proteomics in a Single Cell Using HPLC-FT-ICR-MS
David C. Muddiman
Seminar at 3M Corporation, St. Paul, MN, **2003**
57. DNA Diagnostics by Mass Spectrometry
David C. Muddiman
Molecular Genetics Development Meeting, Mayo Clinic, Rochester, MN **2003**
56. Accurate, Sensitive and Quantitative Nucleic Acid Analyses by ESI-FT-ICR Mass Spectrometry
David C. Muddiman
The Cleveland Clinic Educational Foundation, Department of Cell Biology, Visiting Lecture Pro Tempore, Cleveland, OH. **2003**
55. ESI-FTICR Mass Spectrometry for Genomic and Proteomic Research: From Fundamentals to Clinically Important Applications

David C. Muddiman

Seminar at the University of California-Riverside, Riverside, CA. 2003

54. Genetic Analysis by ESI-FTICR Mass Spectrometry
David C. Muddiman
Lab Automation 2003, Palm Spring, CA. 2003
53. Genomic and Proteomic Characterization by ESI-FT-ICR Mass Spectrometry using IRMPD
David C. Muddiman
Seminar at the University of Minnesota, Minneapolis, MN. 2002
52. ESI-FTICR Mass Spectrometry: From Genotyping to Phosphopeptide Mapping All in a Single Cell
David C. Muddiman
Seminar at the University of Wisconsin at Madison, Madison, WI, 2002
51. Determining Allele Frequency for Single-Nucleotide Polymorphisms by Electrospray Ionization FTICR Mass Spectrometry
David C. Muddiman
Desorption 2002, Estes Park, CO, 2002
50. From SIMS, ESCA and TOF-SIMS to Biological Chemistry: My Herculoid Experience
David C. Muddiman
Hercules' Symposium Honoring his 70th Birthday, Nashville, TN, 2002
49. Characterization of Biological Molecules by Electrospray Ionization FT-ICR Mass Spectrometry
David C. Muddiman
Mayo-Karolinska Metabolic & Nutrition Conference, Stockholm, Sweden, 2002
48. Accurate, Sensitive and Comprehensive Characterization of Biological Molecules by ESI-FT-ICR Mass Spectrometry
David C. Muddiman
Delaware Valley Mass Spectrometry Discussion Group, Merck, West Point, PA 2002
47. Mass Spectrometry and Proteomics: Inseparable Partners
David C. Muddiman
Gannon University and Hamot Medical Center, Erie, PA, 2002
46. High Performance Mass Spectrometry for the Study of Biological Complexity
David C. Muddiman
National Research Council of Canada, Halifax, Nova Scotia 2002 – A Canadian Invention for Canadian Research? (aka "The Great Halifax FTICR Caper")
45. Extensive Evaluation of Novel Sample Preparation Techniques For Using High Sensitivity Mass Measurements of Nucleic Acids Using ESI-FT-ICR Mass Spectrometry

Laura T. George (2001-2002 Ingraham Scholar) and David C. Muddiman
Richmond Chromatography Discussion Group, Richmond, VA 2002

44. Genomics and Proteomics to Gas-Phase Ion Chemistry: Potential Roles of FTICR Mass Spectrometry in the Post-Genome Era
David C. Muddiman
Mayo Clinic and Foundation, Rochester, MN 2002
43. Accurate Mass Tag - Isotope Coded Affinity Tag LC-ESI-FTICR-MS for Protein Identification and Quantification
David C. Muddiman
American Association of Pharmaceutical Scientists, Toronto, CA 2002
42. High Sensitivity and Mass Accuracy of Large Nucleic Acids
David C. Muddiman
Federation of Analytical Chemistry and Spectroscopy Societies, Providence, RI, 2002
41. Genomics to Proteomics: Bridging the Transcriptome with Electrospray Ionization FTICR Mass Spectrometry
David C. Muddiman
Department of Chemistry, University of Pittsburgh, Pittsburgh, PA 2002
40. Novel, Sensitive and Rapid Approaches for Phosphopeptide Mapping
David C. Muddiman
Department of Physiology, Medical College of Virginia, Richmond, VA, 2002
39. Mass Spectrometric Approaches to Investigate Biological Systems
David C. Muddiman
Molecular Biology of Cell Growth Meeting, Massey Cancer Center, Medical College of Virginia, Richmond, VA 2002
38. Electrospray Ionization FTICR Mass Spectrometry: A Powerful Platform for a Diverse Range of Post-Genome Applications
David C. Muddiman
Department of Pharmacology and Toxicology, University of Alabama, Birmingham, AL 2002
37. 'High Throughput' Genotyping of Length Polymorphisms by Mass Spectrometry: Forensic and Clinical Applications
David C. Muddiman
Lab Automation 2002, Palm Springs, CA, 2002
36. ESI-FTICR Mass Spectrometry for Genomics and Proteomics Research: From Accurate Mass Determinations for Allele Subtyping to IRMPD for Phosphopeptide Mapping
David C. Muddiman
Pfizer Global, Ann Arbor, MI, 2001

35. Nucleic Acid Analysis by High Performance Mass Spectrometry
David C. Muddiman
Washington-Baltimore Mass Spectrometry Discussion Group, Gaithersburg, MD 2001
34. Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry of Macromolecules: Putting a Positive Spin on Negative Ions
David C. Muddiman
South Eastern Regional Meeting of the American Chemical Society, Savannah, GA, 2001
33. Mass Spectrometric Approaches to Stratify Cancer Using Molecular Signatures
David C. Muddiman
Vanderbilt University, Nashville, TN, 2001
32. Mass Spectrometry for the Study of Biocomplexity
David C. Muddiman
Virginia Commonwealth University Life Sciences Scholars' Program, Richmond, VA, 2001
31. Characterization of Macromolecules by Negative Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
David C. Muddiman
Eli Lilly, Indianapolis, IN, 2001
30. Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry for the Analysis of Large Biomolecules: Instrumentation and Applications
David C. Muddiman
Richmond Chromatography Discussion Group, Whitehall-Robbins, 2001
29. Genotyping Short Tandem Repeat Polymorphisms by ESI FT-ICR Mass Spectrometry
David C. Muddiman
Joint Seminar: Departments of Pharmaceutics and Medicinal Chemistry, Medical College of Virginia, 2001
28. Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry with a DNA Twist
David C. Muddiman
3rd North American FT-ICR MS Conference, Austin, TX, 2001
27. Genotyping Short Tandem Repeat Loci Using Accurate Mass Measurements and MS/MS by Electrospray Ionization FT-ICR Mass Spectrometry
David C. Muddiman
Clemson University, Clemson, South Carolina, 2001
26. Genotyping Repetitive DNA Sequences with Non-consensus Alleles and Hypervariability by Electrospray Ionization FT-ICR Mass Spectrometry
David C. Muddiman
Case Western Reserve University, Cleveland, Ohio, 2001

25. Genomics to Proteomics: Bridging the Transcriptome with Electrospray Ionization FTICR Mass Spectrometry
David C. Muddiman
Pharmaceutical Congress of the Americas, American Association of Pharmaceutical Scientists, Orlando, FL, 2001.
24. Electrospray Ionization FT-ICR Mass Spectrometry of Large Biomolecules: Implications of Multiple-Charging for Exact and High Mass Measurements
David C. Muddiman
Workshop on Biological Fourier Transform Ion Cyclotron Resonance Mass Spectrometry, Providence, RI, November 6-7, 2000
23. A Novel Algorithm for LC-MS: Enhancements in Both the Signal-to-Noise Ratio and the Resolution of the Analyte Peaks in the Chromatogram
David C. Muddiman
Chromfare, Richmond, VA, 2000
22. Genotyping of Simple and Complex Short Tandem Repeats by Electrospray Ionization Tandem Mass Spectrometry
David C. Muddiman
Department of Biology, Virginia Commonwealth University, Richmond, VA, 2000.
21. Genomics to Gas-Phase Ion Chemistry: The Role of Mass Spectrometry in the Post-Genome Era
D.C. Muddiman
Department of Chemistry and the National High Magnetic Field Laboratory, Florida State University, Tallahassee, Florida, 1999.
20. Biological Mass Spectrometry: From Small Drugs to DNA
David C. Muddiman
Department of Chemistry, College of William and Mary, Williamsburg, VA, 1999.
19. Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry: From Subattomoles to Gene Mapping
David C. Muddiman
Department of Chemistry, Kent State University, Kent, OH, 1999.
18. Electrospray Ionization Mass Spectrometry: A Powerful and Universal Platform for the Analysis of Genetic Variation
David C. Muddiman
Department of Chemistry, Louisiana State University, Baton Rouge, LA, 1999.
17. Investigations of Drug-DNA Interactions and Antisense Therapeutics by Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
David C. Muddiman
Massey Cancer Center, Medical College of Virginia, Richmond, VA, 1999.

16. Electrospray Ionization FT-ICR Mass Spectrometry: A Powerful Platform for Genome and Proteome Characterization
David C. Muddiman
Atlanta Area Mass Spectrometry Discussion Group, Complex Carbohydrate Research Center, University of Georgia, Athens, GA, 1999.
15. Quantification of Relative Protein Ion Currents by Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
David C. Muddiman
Gordon Research Conference on Analytical Chemistry: Microbioanalytical Measurements for the Next Millennium, Henniker, New Hampshire, 1999.
14. Rapid and Accurate Characterization of STRs, VNTRs, and Drug-DNA Interactions Through the Development of ESI-FTICR Mass Spectrometry
David C. Muddiman
Functional Genomics: Technology Development and Research Applications, The Banbury Center, Cold Harbor Spring Laboratory, New York, 1999.
13. Biological Mass Spectrometry: Fundamentals and Applications in Biotechnology
David C. Muddiman
Hampton University, Hampton, VA, 1999.
12. Fourier Transform Ion Cyclotron Resonance Mass Spectrometry with a DNA Twist
David C. Muddiman
Eastern Analytical Symposium, Gold Medal Award Honoring Professor Alan Marshall, 1998
11. Unraveling DNA using Electrospray Ionization Mass Spectrometry: A Powerful Platform for Genetic Mutation Screening
David C. Muddiman
Genome Sequencing and Analysis Conference, The Institute for Genomic Research, Miami Beach, Florida, 1998.
10. Electrospray Ionization Fourier Transform Mass Spectrometry for Genomic Research
David C. Muddiman
Merck and Co., West Point, PA 1998
9. High Performance Large Molecule Mass Spectrometry: Instrumentation and Genomics Applications
David C. Muddiman
Massey Cancer Center, Medical College of Virginia, 1998
8. Combining New Analytical Developments with Genomics: A Multi-Disciplinary Approach with a World of Opportunity
David C. Muddiman
Department of Human Genetics, Medical College of Virginia, 1997

7. Electrospray Ionization Mass Spectrometry of Oligonucleotides
David C. Muddiman
Department of Chemistry and Biochemistry, Montana State University, 1996
6. Biological Applications of Mass Spectrometry: **I)** Investigation of Drugs, Metabolism and Pharmacokinetics **II)** Sequencing the Human Genome
David C. Muddiman
Odense University, Department of Molecular Biology, Odense, Denmark, 1995.
5. Investigation of Oligonucleotides by Electrospray Ionization Mass Spectrometry
David C. Muddiman
University of Münster, Institute for Medicinal Physics and Biophysics, Münster, Germany, 1995.
4. Application of Data Analysis Techniques to Time-of-Flight Mass Spectral Data to obtain Quantitative Information
David C. Muddiman, A.I. Gusev, A. Proctor, D.M. Hercules
Desorption '94, Bend, Oregon. 1994.
3. New Approaches Towards Measurement of Drugs and Metabolites in Microquantities by Time-of-Flight Mass Spectrometry
David C. Muddiman, A.I. Gusev, V. Warty, D.M. Hercules
Department of Clinical Chemistry, Children's Hospital, Pittsburgh, PA 1993.
2. Time-of-Flight Secondary Ion Mass Spectrometry: Instrumentation and Applications
David C. Muddiman, A.G. Sharkey, D.M. Hercules
Department of Geology, University of Pittsburgh, Pittsburgh, Pennsylvania, 1993.
1. Development of New Applications for Time-of-Flight Secondary-Ion Mass Spectrometry
David C. Muddiman, D.M. Hercules
Aluminum Corporation of America (ALCOA), Pittsburgh, Pennsylvania, 1992.

NATIONAL AND INTERNATIONAL MEETING PRESENTATIONS**(reverse-chronological order)**

184. Establishing an “Index of Individuality” for the Chicken Plasma Proteome using Label-Free Proteomics
A.M. Hawkrige, R. Wysocky, J. Petite, K. Anderson, and D.C. Muddiman
Triangle Area Mass Spectrometry Discussion Group, Sigma Xi, RTP, NC 2009
183. Profiling the N-linked Glycome from Human and Chicken Plasma to Identify Epithelial Ovarian Cancer Biomarkers
D.C. Muddiman, R.B. Dixon, M.S. Bereman, A.M. Hawkrige, J. Petite, and W.A. Cliby
Triangle Area Mass Spectrometry Discussion Group, Sigma Xi, RTP, NC 2009
- 182.
181. Utilizing Hydrophobic Chemical Tagging to Improve Detection Limits for Quantification of B-type Natriuretic Peptide by Protein Cleavage Isotope Dilution Mass Spectrometry
C.M. Shuford, D.L. Comins, J.L. Whitten, J.C. Burnett, Jr., and D.C. Muddiman
Triangle Area Mass Spectrometry Discussion Group, Sigma Xi, RTP, NC 2009
180. Method Development for the Characterization of Thermophilic Bacterial Proteomes by nanoLC-FT-ICR Mass Spectrometry: Probing for Novel Thermostable Biocatalysts
G.L. Andrews, D.L. Lewis, J. Notey, R.M. Kelly, D.C. Muddiman
Triangle Area Mass Spectrometry Discussion Group, Sigma Xi, RTP, NC 2009
179. Temporal Proteomic Characterization of Spontaneous Ovarian Cancer in the Chicken
A.M. Hawkrige, R. Wysocky, J. Petite, K. Anderson, P.E. Mozdziak, J.M. Horowitz, and D.C. Muddiman
AACR Frontiers in Basic Cancer Research, Boston, MA 2009
178. Profiling the N-linked Glycome from Human and Chicken Plasma to Identify Epithelial Ovarian Cancer Biomarkers
D.C. Muddiman, R.B. Dixon, M.S. Bereman, A.M. Hawkrige, J. Petite, and W.A. Cliby
HUPO VIII World Congress, Toronto, CANADA 2009
177. Establishing an “Index of Individuality” for the Chicken Plasma Proteome using Label-Free Proteomics
A.M. Hawkrige, R. Wysocky, J. Petite, K. Anderson, and D.C. Muddiman
HUPO VIII World Congress, Toronto, CANADA 2009
176. Intracellular Signaling During Early Differentiation of Human Embryonic Stem Cells
B. Rao, P. Sarkar, T.S. Collier, D.C. Muddiman
AChE Annual Meeting, Nashville, TN 2009
175. Array of Micromachined UltraSonic ElectroSpray (AMUSE) Ion Source for High Throughput, Multiplexed Bioanalytical Mass Spectrometry
T.P. Forbes, C.Y. Hampton, R.B. Dixon, D.C. Muddiman, F.M. Fernandez, F.L.

Degertekin, A.G. Fedorov
ASME International Mechanical Engineering Congress and Exposition, Lake Buena Vista, FL, 2009

174. Development of an Air Amplifier-Assisted Protein-Cleavage Isotope Dilution Mass Spectrometry Method for Prostate Specific Antigen in the Nano-Flow Regime
R.B. Dixon, D.K. Williams, A. Sohn, J.R. Edwards, T.A. Dow, D.C. Muddiman
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
173. Proteomic Profiling of *Populus trichocarpa* for the Interrogation of Molecular Mechanisms behind Wood Formation
T.I. Williams, Y-H Sun, T-F Yeh, J.S. Sampson, D.C. Muddiman, V. Chiang
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
172. Electrohydrodynamic Charge Separation for Improving Analyte Ionization in the Array of Micromachined UltraSonic Electrospray (AMUSE) Ion Source
T.P. Forbes, R.B. Dixon, D.C. Muddiman, F.L. Degertekin, A.G. Fedorov
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
171. Investigating the Secretome of Individual and Co-cultured Thermophiles for Small Putative Proteins of Enzymatic Potential
G.L. Andrews, D.L. Lewis, S.E. Blumer-Schuetz, J. Notey, R.M. Kelly, T.S. Collier, D.C. Muddiman
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
170. Evaluation of Novel Front-End Technologies to Facilitate the Study of BNP-32 by High Performance Mass Spectrometry
C.M. Shuford, G.L. Andrews, D.K. Williams, J.C. Burnett, A.M. Hawkrige, D.C. Muddiman
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
169. One-Year Longitudinal Study of the Chicken Plasma Proteome to Identify Biomarkers for Epithelial Cancer
A.M. Hawkrige, R. Wysocky, J. Petitte, K. Anderson, P. Mozdziak, J. Horowitz, D.C. Muddiman
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
168. Infrared Matrix-Assisted Laser Desorption Electrospray Ionization Coupled to FT-ICR Mass Spectrometry
K.K. Murray, J.S. Sampson, D.C. Muddiman
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
167. Elucidation of the MALDESI Mechanism Using Deuterated Solvents, Remote Analyte Sampling Transport and Ionization Relay Coupled with FT-ICR Mass Spectrometry
J.S. Sampson, R.B. Dixon, D.C. Muddiman
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.

166. Understanding Hydrophobicity and Limits of Detection for Biologically Relevant Peptides using the ALIPHAT Method and Electrospray Ionization
D.K. Williams, I.D. Bori, P. Ondachi, D.L. Comins, J. Whitten, D.C. Muddiman
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
165. Exploring the N-linked Glycome for Early Detection of Epithelial Ovarian Cancer by nanoLC FT-ICR Mass Spectrometry
M.S. Bereman, W.A. Cliby, and D.C. Muddiman
57th American Society for Mass Spectrometry Conference, Philadelphia, PA, 2009.
164. Method Development for the Improved Detection of B-type Natriuretic Peptide by High Performance Mass Spectrometry
C.S. Shuford, G.L. Andrews, J.C. Burnett, Jr., A.M. Hawkridge, D.C. Muddiman
Triangle Chromatography Discussion Group, Raleigh, NC, 2009
163. Quantitative Top-Down and Bottom-Up Proteomics of Aflatoxin Producing *Aspergillus flavus* Utilizing Gel Electrophoresis, mRP Chromatography, and Online nano-Flow LC-MS/MS
T.S. Collier, A.M. Hawkridge, D.R. Georgianna, G.A. Payne, D.C. Muddiman
Triangle Chromatography Discussion Group, Raleigh, NC, 2009
162. Investigating Potential Protein Functions of Small Unknown Reading Frames Secreted by Individual and Co-Cultured Thermophiles
G.L. Andrews, D.L. Lewis, S.E. Blumer-Schuetz, J. Notey, R.M. Kelly, T.S. Collier, D.C. Muddiman
Triangle Chromatography Discussion Group, Raleigh, NC, 2009
161. Development of an Air Amplifier Assisted Protein-Cleavage Isotope Dilution Mass Spectrometry for Prostate Specific Antigen in the Nano-Flow Regime
R.N. Dixon, D.K. Williams, J.R. Edwards, T.A. Dow, D.C. Muddiman
Triangle Chromatography Discussion Group, Raleigh, NC, 2009
160. The Development of Nano LC Mass Spectrometric Methods for Profiling Glycans in Epithelial Ovarian Cancer (EOC) and Control Plasma
M.S. Bereman, T.I. Williams, K. R. Kalli, W. A. Cliby and D.C. Muddiman
60th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL, 2009
159. Applications of Solid- and Liquid-State Infrared Matrix-Assisted Laser Desorption Electrospray Ionization (IR-MALDESI) for Analysis of Biological Macromolecules and Tissue Imaging
J.S. Sampson, K.K. Murray, R.B. Dixon, T. Ghashghaei, D.C. Muddiman
237th ACS National Meeting, Salt Lake City, UT, March 2009
158. Synthesis of Novel Iodoacetamide Derivatives for Proteomics Research
M.G. Jessico, P.W. Ondachi, D.L. Comins, D.C. Muddiman
237th ACS National Meeting, Salt Lake City, UT, March 2009

157. Glycan Analysis by Nano LC-MS: Applications for Biomarker Discovery in Epithelial Ovarian Cancer
M.S. Bereman, T.I. Williams, K. R. Kalli, W. A. Cliby and D.C. Muddiman
The Ninth Annual Atlanta-Athens Mass Spectrometry Discussion Group, Athens, GA, October 2008
156. In Search of Epithelial Ovarian Cancer Molecular Markers by MALDI-FT-ICR-MS and NanoLC LTQ-Orbitrap-MS
T. Islam Williams, M.S. Bereman, K.R. Kalli, W.A. Cliby and D.C. Muddiman
Mass Spectrometry Applications to the Clinical Laboratory, University of California – San Diego, San Diego, CA, 2008
155. Can the Diagnostic and Prognostic Value of Prostate Specific Antigen Be Improved by Harnessing the Specificity of Mass Spectrometry?
R.B. Dixon, J.R. Edwards, A. Sohn, T.A. Dow, D.C. Muddiman
100th Annual Meeting of the American Institute of Chemical Engineers Philadelphia, PA, 2008
154. Alternative Splicing Database for Bottom-Up and Top-Down Protein Identification
Kung-Yen Chang, D.R. Georgianna, S.A. Heber, G.A. Payne, D.C. Muddiman
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
153. Comparative Investigation of the Chicken and Human Plasma Proteome: Implications for Biomarker Discovery in Epithelial Ovarian Cancer
A.M. Hawkrige, B. Wysocky, J. N. Petite, P.E. Mozdziak, K.E. Anderson, W.A. Cliby, J.M. Horowitz, D.C. Muddiman
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
152. Identification and Quantification of Intact Proteins from *A. flavus* using SILAC and nano-Flow LC-LTQ-FT-ICR-MS
T.S. Collier, A.M. Hawkrige, D.R. Georgianna, Gary A. Payne, D.C. Muddiman
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
151. Development of a New Ionization Source Liquid Matrix-Assisted Laser Desorption Electrospray Ionization and Investigation of the MALDESI Ionization Mechanism
J.S. Sampson, R.B. Dixon, A.M. Hawkrige, D.C. Muddiman
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
150. Analysis of O-linked Glycans Derived from Normal and Diseased EOC Plasma by Nano LC-ESI-FTICR Mass Spectrometry
M.S. Bereman, T.I. Williams, A.M. Hawkrige, D.C. Muddiman
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
149. Mining the Plasma Glycoproteome for Epithelial Ovarian Cancer Biomarker Discovery
T.I. Williams, W.A. Cliby, K.R. Kalli, D.C. Muddiman
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.

148. Application of Iodoacetamide Derivatives Utilized to Increase Ion Abundance through the ALiPHAT Strategy
D.C. Muddiman, D.K. Williams, C.W. Meadows, D.L. Comins, A.M. Hawkrigde
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
147. Development and Utilization of Aerodynamic Devices for Ambient Ionization in Mass Spectrometry
R.B. Dixon, J.S. Sampson, A.M. Hawkrigde, D.C. Muddiman
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
146. Absolute Quantification of C-Reactive Protein in Plasma Utilizing Isotope Dilution Mass Spectrometry
D.K. Williams, R.B. Dixon, A.M. Hawkrigde, D.C. Muddiman
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
145. Exploring Mechanisms of Analyte Ionization in AMSUE (Array of Micromachined UltraSonic ElectroSpray) Ion Source Combined with an FT-ICR Mass Spectrometer
T.P. Forbes, R.B. Dixon, D.C. Muddiman, F.L. Degertekin, A.G. Fedorov
56th American Society for Mass Spectrometry Conference, Denver, CO, 2008.
144. The Development of Novel Ionization Sources Incorporated with Aerodynamic Devices for Bio-Analytical Studies on a Hybrid LTQ-FT-ICR Mass Spectrometer
R. Brent Dixon, J.S. Sampson, T.P. Forbes, A.M. Hawkrigde, A.G. Fedorov and D.C. Muddiman
Triangle Chromatography Symposium, Raleigh, NC, 2008
143. Top-Down identification and Quantification of Proteins from the Prototroph *Aspergillus flavus* using nano-Flow Reversed-Phase LC Directly Coupled to LTQ-FT-ICR Mass Spectrometry
T.S. Collier, A.M. Hawkrigde, D.R. Georgianna, G.A. Payne, and D.C. Muddiman
Triangle Chromatography Symposium, Raleigh, NC, 2008
142. Liquid Matrix-Assisted Laser Desorption ElectroSpray Ionization (liq-MALDESI) Coupled to a Hybrid FT-ICR Mass Spectrometer for Direct Analysis of Biological Molecules
J.S. Sampson, Adam M. Hawkrigde, D.C. Muddiman
Triangle Chromatography Symposium, Raleigh, NC, 2008
141. The Development of a Nano-LC-FT-ICR Mass Spectrometric Method for Profiling Glycans in Diseased and Control Epithelial Ovarian Cancer (EOC)
M.S. Bereman, T.I. Williams, D.C. Muddiman
Triangle Chromatography Symposium, Raleigh, NC, 2008
140. Proteomic Characterization of Hydroquinone-Induced Blebs in a Human RPE Cell Line
O. Alcazar, A.M. Hawkrigde, D.C. Muddiman, S.K. Bhattacharya, and M.E. Marin-Castano
The Association for Research in Vision and Ophthalmology, Ft. Lauderdale, FL, 2008

139. Preparation and Quantitative Intact Protein Analysis of the Fungus *Aspergillus Flavus* using SILAC, Accurate Intact Mass and Arginine Counting by RPLC-FT Mass Spectrometry
T.S. Collier, D.C. Muddiman, D.K. Williams, Jr., A.M. Hawkridge, D.R. Georgianna, and G.A. Payne
The Southeastern Regional Meeting of the American Chemical Society (SERMACS), Greenville, SC, 2007
138. Salt Tolerance and Molecular Weight Determination using Matrix-Assisted Laser Desorption Electrospray Ionization (MALDESI) Coupled to LTQ-FT-ICR Mass Spectrometry
J.S. Sampson, A.M. Hawkridge, and D.C. Muddiman
The Southeastern Regional Meeting of the American Chemical Society (SERMACS), Greenville, SC, 2007
137. Coupling Automatic Gain Control and Calibration Laws to Achieve Parts-Per-Billion Mass Measurement Accuracy Utilizing a FT-ICR Mass Spectrometer
D.K. Williams, Jr. and D.C. Muddiman
The Southeastern Regional Meeting of the American Chemical Society (SERMACS), Greenville, SC, 2007
136. Improved Ion Abundance in LTQ and LTQ-FT-ICR Mass Spectrometry by Implementing an Air Amplifier
R. B. Dixon, J. R. Edwards, A. G. Fedorov, A. M. Hawkridge, and D. C. Muddiman
The Southeastern Regional Meeting of the American Chemical Society (SERMACS), Greenville, SC, 2007
135. Characterization and Biological Applications of Desorption Electrospray Ionization Coupled to Hybrid FT-ICR Mass Spectrometry
M.S. Bereman, T.I. Williams, and D.C. Muddiman
The Southeastern Regional Meeting of the American Chemical Society (SERMACS), Greenville, SC, 2007
134. Integrating Voltage-Assisted Hydrodynamic Devices to Efficiently Sample Biological Specimens
R.B. Dixon, D.K. Williams, J.S. Sampson; J.R. Edwards, A.M. Hawkridge, and D.C. Muddiman,
23rd Annual Asilomar Conference on Mass Spectrometry, Pacific Grove, CA, 2007
133. Proteomic Analyses of Proteins Isolated from Mammalian Bone Using a Pressure Cycling Technology
G.B. Smejkal, A.T. Kwan, I. Romanovsky, D.C. Muddiman, M.H. Schweitzer, and T.S. Collier
International Human Proteome Organization, Seoul, Korea, 2007
132. Relative Quantification Proteomics Reveals Temperature Dependent Protein Changes in the Toxigenic Fungus *Aspergillus flavus*
D.R. Georgianna, D.C. Muddiman, A.M. Hawkridge, and G.A. Payne

1st International Conference on Toxicogenomics Integrated with Environmental Sciences, Raleigh, NC, 2007

131. O-Linked Protein Glycosylations in Plasma as Biomarkers for Epithelial Ovarian Cancer
T.I. Williams, J.S. Sampson, A.M. Hawkrigde, W.A. Cliby, D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
130. Mass Measurement Accuracy Comparison of Double Focusing Magnetic Sector and Time-of-Flight Mass Analyzers
M.M. Lyndon, R.B. Dixon, M.S. Bereman, and D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
129. Calibration Laws Based on Multiple Linear Regression Applied to MALDI-FT-ICR-Mass Spectrometry
M.A. Chadwick, T.I. Williams, D.K. Williams, Jr. and D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
128. Investigations with O-linked Protein Glycosylations by MALDI-FTICR-MS
D.A. Saggese, T.I. Williams, R.J. Wilcox, J.D. Martin, H.J. An, B. Li, C.B. Lebrilla and D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
127. MALDI-FT-ICR-MS Quantification of Peptides and Oligosaccharides using Stable-Isotope Labels
K.L. Toups, T.I. Williams, J. Zheng, J.L. Frahm and D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
126. Augmented Limits of Detection for Peptides with Hydrophobic Alkyl Tags (ALiPHAT)
J.L. Frahm, A.M. Hawkrigde, D.L. Comins, I.D. Bori, D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
125. Quantitative Mass Spectrometric Assay Development for Characterizing Endogenous B-type Natriuretic Peptide (BNP) from Congestive Heart Failure Patients
A.M. Hawkrigde, D.M. Heublein, A. Cataliotti, J.C. Burnett, Jr., D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
124. Characterization of Liquid Chromatography Strategies to Separate Intact Proteins and its Application to Top-Down Proteomics
T.S. Collier, D.K. Williams, D.C. Muddiman, A. M. Hawkrigde, D.R. Georgianna, G.A. Payne
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
123. Characterization of Ion Generation by a Venturi-assisted Array of Micromachined Ultrasonic Electrospays
F.M. Fernandez, C.Y. Hampton, T. Forbes, M. Meacham, R.B. Dixon, D.C. Muddiman, L. Degertekin, A. Fedorov
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.

122. Stable Isotope Labeling for Relative Protein Quantification in the Agronomically Important Filamentous Fungus *Aspergillus flavus*
D. R. Georgianna, D.C. Muddiman, G.A. Payne
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
121. Development and Characterization of a Desorption Electrospray Ionization Source Coupled to Hybrid Fourier Transform Ion Cyclotron Resonance Mass Spectrometry for Biological Analyses
M.S. Bereman, D.C. Muddiman, A.M. Hawkrige
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
120. Investigation of Mass Measurement Accuracy of Intact Proteins and Product Ions using Hybrid Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
D.K. Williams, Jr., A.M. Hawkrige, D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
119. Characterization of Matrix-Assisted Laser Desorption Electrospray Ionization (MALDESI) Coupled to a Hybrid FT-ICR Mass Spectrometer for the Direct Analysis of Proteins
J.S. Sampson, A.M. Hawkrige, D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
118. Complementing Novel Ionization Techniques with Voltage-Assisted Hydrodynamic Devices by Optimizing Physicochemical Parameters to Efficiently Sample Biological Specimens
R. B. Dixon, X. Xiao, J.R. Edwards, A.M. Hawkrige, and D.C. Muddiman
55th American Society for Mass Spectrometry Conference, Indianapolis, IN, 2007.
117. Direct Analysis of Biological Molecules by Matrix Assisted Laser Desorption Electrospray Ionization (MALDESI) Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
J.S. Sampson, A.M. Hawkrige, D.C. Muddiman
121st North Carolina American Chemical Society Meeting, Durham, NC, 2007
116. Parts-Per-Billion Mass Measurement Accuracy Achieved by Automatic Gain Control and Calibration Laws Utilizing FT-ICR Mass Spectrometry
D.K. Williams, Jr. and D.C. Muddiman
121st North Carolina American Chemical Society Meeting, Durham, NC, 2007
115. Improved Limits of Detection by Implementation of a Voltage-Assisted Air Amplifier in ESI-FT-ICR-MS
R. B. Dixon, A.M. Hawkrige, X.D. Xiao, J.R. Edwards, and D.C. Muddiman
121st North Carolina American Chemical Society Meeting, Durham, NC, 2007
114. The Development and Fundamental Studies of a Desorption Electrospray Ionization Source coupled to FT-ICR and Linear Ion Trap Mass Spectrometers
M.S. Bereman and D.C. Muddiman
121st North Carolina American Chemical Society Meeting, Durham, NC, 2007

113. Electrophoretic Analyses of Proteins and Peptides Isolated from Cortical Bone using a Pressure Cycling Technology
G.B. Smejkal, D.C. Muddiman, M.H. Schweitzer
United States Human Proteome Organization, 3rd Annual Meeting, Seattle, WA 2007
112. AMUSE (Array of Micromachined UltraSonic ElectroSpray) Ion Source for High Throughput, Multiplexed Bioanalytical Mass Spectrometry
T.P. Forbes, C.Y. Hampton, J.M. Meacham, F.M. Fernandez, F.L. Degertekin, R.B. Dixon, D.C. Muddiman, and A.G. Fedorov
United States Human Proteome Organization, 3rd Annual Meeting, Seattle, WA 2007
111. Relative Protein Quantification through Stable Isotope Labeling by Amino Acids in *Aspergillus flavus*: Temperature Regulation of Aflatoxin Biosynthesis
D.R. Georgianna, D.C. Muddiman, and G.A. Payne
24th Fungal Genetics Conference, Asilomar Center, Pacific Grove, CA, 2007
110. Hybrid Atmospheric Pressure Ionization Sources Coupled to FT-ICR Mass Spectrometry: Implications for Biological Imaging
D.C. Muddiman, M.S. Bereman, J.S. Sampson, A.M. Hawkrige, F.M. Fernandez and L. Nyadong
ASMS Sanibel Conference on Mass Spectrometry, Imaging Mass Spectrometry, Sundial Resort, Sanibel Island, Florida, 2007
109. Utilization of Amine Specific Chemistry and Stable Isotope Labels to Understand the Influence of Post-Excitation Radius and Axial Confinement Field on Quantitative FT-ICR Mass Spectrometry Proteomic Measurements
C.M. Capo Velez, J.L. Frahm, D.C. Muddiman
Annual Biomedical Research Conference for Minority Students, Anaheim, CA, 2006
108. Achieving High Mass Measurement Accuracy of Intact Proteins and Product Ions Utilizing a Dual ElectroSpray Ionization Quadrupole Fourier Transform Ion Cyclotron Resonance Mass Spectrometer
D.K. Williams, Jr., A.M. Hawkrige and D.C. Muddiman
58th Southeastern Regional Meeting of the American Chemical Society, Augusta, GA, 2006
107. Matrix-Assisted Laser Desorption ElectroSpray Ionization (MALDESI) FT-ICR-Mass Spectrometry for Direct Analysis of Biological Molecules
J.S. Sampson, A.M. Hawkrige and D.C. Muddiman
58th Southeastern Regional Meeting of the American Chemical Society, Augusta, GA, 2006
106. Desorption ElectroSpray Ionization Coupled to Fourier Transform Ion Cyclotron Resonance Mass Spectrometry (DESI-FT-ICR-MS) for the Analysis of Proteins and Peptides
M.S. Bereman, D.C. Muddiman, F.M. Fernandez, and L. Nyadong
58th Southeastern Regional Meeting of the American Chemical Society, Augusta, GA, 2006

105. Characteristics of an Air Amplifier Coupled to ESI-FT-ICR and ESI-LTQ Mass Spectrometers Resulting in Improved Ion Abundance and Greater Sensitivity of Biological Samples
R.B. Dixon, A.M. Hawkrige, X.D. Xiao, J.R. Edwards, J. Canterbury, M. MacCoss, and D.C. Muddiman
58th Southeastern Regional Meeting of the American Chemical Society, Augusta, GA, 2006
104. Utilization of Amine Specific Chemistry and Stable Isotope Labels to Understand the Influence of Post-Excitation Radius and Axial Confinement Field on Quantitative FT-ICR Mass Spectrometry Proteomic Measurements
C.M. Capo, J.L. Frahm, D.C. Muddiman
5th Annual North Carolina State University Undergraduate Research Symposium, Raleigh, NC, 2006
103. Investigating Molecular Heterogeneity of Circulating Brain Natriuretic Peptide in Human Heart Failure Patients by Mass Spectrometry
A.M. Hawkrige, A. Cataliotti, D.M. Heublein, J.C. Burnett, Jr., D.C. Muddiman
3rd Annual Symposium of the American Heart Association Council on Basic Cardiovascular Sciences, Denver, Colorado, 2006.
102. Novel Front-End Modifications to a Quadrupole ESI-FT-ICR Mass Spectrometer Enabling Accurate Mass and MS/MS Measurements with Improved Sensitivity
K.E. Bennet, D.K. Williams, Jr., X.D. Xiao, J.R. Edwards, D. Dragomir-Daescu, M.J. Burke, P.E. Caskey, A.M. Hawkrige, R.B. Dixon, J. Canterbury, M. MacCoss and D.C. Muddiman
17th Annual International Mass Spectrometry Conference, Prague, Czech Republic, 2006
101. Utilizing Iodopeptides to Access Unoccupied Mass Space for Confident Identification and Accurate Quantification in Label-Free Proteomics
J.L. Frahm, A.M. Hawkrige, B.E. Howard, S. Heber, D.C. Muddiman
Triangle Area Mass Spectrometry Meeting, Raleigh, NC, 2006
100. Cellular Class I-Restricted Immune Responses to Naturally Processed and HLA-A*0201-Presented Vaccinia Virus Epitope and the Rationale for Design of a Smallpox Peptide Vaccine
I.G. Ovsyannikova, J.E. Ryan, K.L. Johnson, R.B. Kennedy, D.C. Muddiman, and G.A. Poland
Sixth Annual Conference on Vaccine Research, Baltimore, MD, 2006
99. Ovarian Cancer Biomarker Discovery using Abundant Plasma Protein Depletion, 2D-PAGE and Post-Translational Modification Specific Stains
D.C. Muddiman, Y. Ogata, M.C. Charlesworth, W.A. Cliby, B.J. Madden, C.J. Heppelmann, H.R. Bergen III
54th American Society for Mass Spectrometry Conference, Seattle, WA, 2006.
98. Forbidden Zones in Proteomics and its Ramifications and Possibilities for Analysis of

Complex Protein Mixtures

J.L. Frahm, B.E. Howard, S. Heber, D.C. Muddiman

54th American Society for Mass Spectrometry Conference, Seattle, WA, 2006.

97. Differential Protein Expression Between Male and Female Human Lumbar Cerebrospinal Fluid after Abundant Protein Depletion
Y. Ogata, D.C. Muddiman, L. Higgins, L. Lomas, B.M. Keegan, S.A. Vernino, and H.R. Bergen III
54th American Society for Mass Spectrometry Conference, Seattle, WA, 2006.
96. RAAMS: An Algorithm for Automatically Interpreting Mass Spectra of ¹⁸O Labeled Isotopic Clusters
C.J. Mason, J.E. Eckel-Passow, K.L. Johnson, T.M. Therneau, A.L. Oberg, D.C. Muddiman, and H.R. Bergen III
54th American Society for Mass Spectrometry Conference, Seattle, WA, 2006.
95. Pancreatic Cancer Biomarker Discovery – Comparative Analysis of the Low Molecular Weight Fraction from Case/Control Plasma Samples Analyzed by LC/MS TOF
M.W. Holmes, H.R. Bergen III, D.C. Muddiman, D.W. Mahoney, A.L. Oberg, J.E. Olson, D.A. Weil, K.L. Johnson
54th American Society for Mass Spectrometry Conference, Seattle, WA, 2006.
94. Relative Quantification of Proteins in Plasma from Pancreatic Cancer Patients using ¹⁸O/¹⁶O Labeling and 2-Dimensional Liquid Chromatography Tandem Mass Spectrometry
K.L. Johnson, C.J. Mason, J.E. Eckel-Passow, D.W. Mahoney, A.L. Oberg, T.M. Therneau, J.E. Olson, D.C. Muddiman, H.R. Bergen, III
54th American Society for Mass Spectrometry Conference, Seattle, WA, 2006.
93. Agonist Dependence of the Platelet Secretome
W.G. Owen, M.C. Charlesworth, D.C. Muddiman
The International Society on Thrombosis and Haemostasis XXth Congress, Sydney, Australia, 2005.
92. Evaluation of Two Hybrid ESI-FT-ICR Mass Spectrometers for Top-Down Proteomics
B.J. Madden, A.M. Hawkrigde, D.C. Muddiman
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
91. Development of an Immunoaffinity-Based Approach for Targeted Biomarker Discovery in Congestive Heart Failure Patients by nanoLC-FT-ICR-MS
A.M. Hawkrigde, D.M. Heublein, H.R. Bergen III, J.C. Burnett Jr., D.C. Muddiman
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
90. Soft Protein Ionization Assisted by High Velocity Gas Flow
P. Yang, Z. Ouyang, R.G. Cooks, A.M. Hawkrigde and D.C. Muddiman
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
89. Development of New Calibration Laws to Improve Mass Measurement Accuracy in Fourier Transform Ion Cyclotron Resonance Mass Spectrometry

- L. Jing, D.C. Muddiman, A.L. Oberg
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
88. Development of a Biomarker Discovery Platform Based Upon Ultrafiltration-LC-FT-ICR-MS Applied to Ovarian and Pancreatic Cancer
K.L. Johnson, C.J. Mason, M.C. Charlesworth, Y. Ogata, W.A. Cliby, J.E. Olson, D.C. Muddiman
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
87. Determination of Stable Isotope Labeling Efficiency of Overexpressed Proteins by nLC-ESI-FT-ICR-MS
L.M. Benson, C.J. Mason, D.C. Muddiman, E. Atanasova, J.H. Streiff, K.A. Jones, F.G. Prendergast
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
86. Differential Protein Expression in Geldanamycin-Resistant A549 Human Lung Carcinoma Cells Identified by Two-Dimensional Gel Electrophoresis (2DGE) and nanoLC-MS/MS
M.C. Charlesworth, B.J. Madden, D.O. Toft, C. Erlichman, D.C. Muddiman
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
85. Identification of Spectrin Variants Associated with Hereditary Erythrocyte Elliptocytosis using Proteomic Analysis
H.R. Bergen, J. Hoyer, J.F. O'Brien, D.C. Muddiman
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
84. Evaluation of Immunoaffinity Protein Depletion Methods for the Analysis of Low-Abundant Proteins and their Post-translational Modifications in Human Cerebrospinal Fluid
Y. Ogata, M.C. Charlesworth, D.C. Muddiman
53rd Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, 2005.
83. Reproducibility of LC-FT-ICR-MS for Proteomic Analysis of the Low Molecular Weight Fraction of Serum and Plasma
J.E. Olson, A.L. Oberg, K.L. Johnson, C.J. Mason, D.C. Muddiman
American Association for Cancer Research's 96th Annual Meeting, Anaheim, CA, 2005.
82. Statistical Evaluation of Internal and External Mass Calibration Laws Utilized in Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
A.L. Oberg, D.C. Muddiman, T.M. Therneau
Eastern North America Region of the International Biometric Society, Austin, TX, 2005.
81. Peak-Picking Algorithm for LC-ESI-FT-ICR Mass Spectrometry
J.E. Eckel-Passow, A.L. Oberg, T.M. Therneau, C.J. Mason and D.C. Muddiman
Eastern North America Region of the International Biometric Society, Austin, TX, 2005.
80. Coordination-Driven Self-Assemblies with a Carborane Backbone
H. Jude, H. Distenfeld, S. Fischer, T. Wedge, M.F. Hawthorne, D.C. Muddiman, P.J. Stang
229th ACS National Meeting, San Diego, CA, 2005.

79. Characterization of Lattice Transformations in Bacteriophage P22 Capsids using Hydrogen/Deuterium Exchange (HDEX) Combined with Mass Spectrometry
S.Kang, A.M. Hawkridge, D.C. Muddiman, P.E. Prevelige
Biophysical Society 48th Annual Meeting, Long Beach, CA, 2005.
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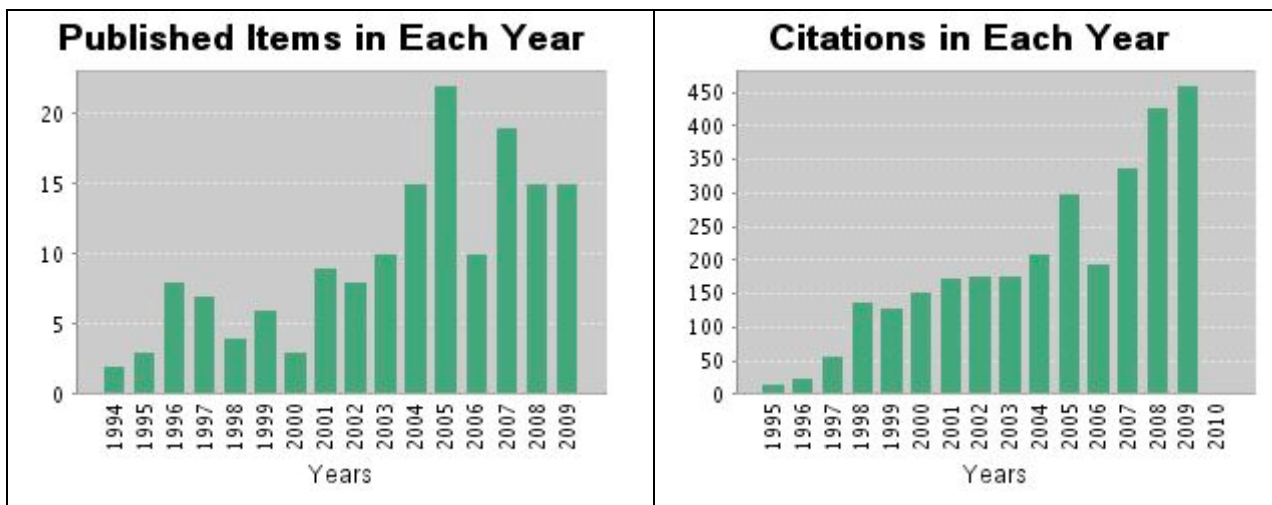
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