

Curriculum Vitae for
Edward J. Brush, Ph.D.
Professor of Chemistry
Bridgewater State University

Contact Information

Department of Chemical Sciences
Bridgewater State University
Bridgewater, MA 02325
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Education

1974-1978 King's College, Wilkes-Barre, PA
B.Sc. with Honors in Chemistry, May 1978
Award: NSF-Student Originated Studies grant, Summer 1977

1978-1984 Pennsylvania State University, State College, PA
Ph.D. in Chemistry (with Dr. Gordon A. Hamilton), August 1984

Professional Experience

Bridgewater State University, Department of Chemical Sciences

Professor	September 2010
Chair (Chemical Sciences)	September 2006 – June 2009
Associate Professor (tenured)	September 2001 – August 2010
Assistant Professor	September 1998 - August 2001

UMASS Lowell, Center for Green Chemistry

Sabbatical - Adjunct Faculty Member	September 2005 – August 2006
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Clark University, Carlson School of Chemistry

Visiting Assistant Professor	August 1996 - July 1998
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Kutztown University, Department of Physical Sciences

Assistant Professor	September 1995 - May 1996
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Tufts University, Department of Chemistry

Assistant Professor	September 1988 - August 1995
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University of Maryland, Department of Chemistry and Biochemistry

Postdoctoral Research Associate	September 1984 - August 1988
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Mentor: Dr. John W. Kozarich
American Cancer Society Postdoctoral Fellowship

Honors and Awards – Bridgewater State University

Honors Program Outstanding Faculty Award (2005)
The Dr. V. James DiNardo Award for Excellence in Teaching (2004)
Nominated for CASE U.S. Professor of the Year Award (2004)

Professional Activities

Membership in Professional Societies

American Chemical Society (Divisions of Chemical Education, Organic Chemistry, Biochemistry, and Environmental Chemistry), Council on Undergraduate Research, American Association for the Advancement of Science

Professional Review Work

Journal of Chemical Education, Bioorganic & Medicinal Chemistry Letters
American Chemical Society Petroleum Research Fund (PRF) Grants Program
Green Chemistry Institute – PRF Grants Program
Research Corporation Grants Program
External Program Reviewer, Department of Chemistry SUNY Oneonta
External NSF Grant Reviewer, SUNY Oneonta Chemistry and Stonehill College Chemistry
ACS Books Symposium Series on Green Chemistry Education

Conference Organizer and Session Chair

Program Chair, New England Association of Chemistry Teachers, 68th Summer Conference on Green Chemistry, Bridgewater State University, August 7-10, 2006.
Session Organizer and Chair, “Green Chemistry as an Integral Component of Academic Sustainability Centers,” American Chemical Society National Meeting (CHED), Boston, August 2007.
Session Organizer and Co-Chair, “Green and sustainable chemistry education: Preparing students for challenging and emerging careers,” American Chemical Society National Meeting (CHED) Salt Lake City, March 2009.
Co-Organizer and co-Program Chair, New England Undergraduate Environmental Research Symposium, Bridgewater State University, 2002-present.

Recent External Grant Applications

NSF – CCLI Program, “Enhancement of an Interdisciplinary Environmental Science Curriculum by Integration of a Gas Chromatograph/Mass Spectrometer and Ion Chromatograph in the Undergraduate Laboratories”, 5/1/2000 – 5/31/2004, \$126,998 (includes 1:1 BSU match). Principal investigator with co-PI’s Dr. Kevin Curry and Dr. Tammy De Ramos-King. **(FUNDED)**

National Conferences on Undergraduate Research and Alice and Leslie E. Lancy Foundation (NCUR/Lancy), “Rapid Growth and Development In Southeastern Massachusetts: The Impact on Natural Resources In The Town of Bridgewater and Neighboring Communities”, co-writer and investigator May 2001-April 2002, \$50,000 (plus \$5,000 BSU match); Project Director, May 2002-September 2003, \$22,500 (plus \$6,500 BSU match); (competitive renewal). **(FUNDED)**

Research Corporation Cottrell College Science Award, “Synthesis and Evaluation Of Glutathione-Oxindole Conjugates As Specific Inhibitors Of Glutathione-Requiring, Anti-Cancer Target Enzymes”, June 1, 2001-December 31, 2004, \$28,420 (plus \$6,500 BSU match); PI. **(FUNDED)**

National Science Foundation – Major Research Instrumentation, “Acquisition of a 300 MHz NMR to Enhance Faculty and Undergraduate Research and Chemical Education at Bridgewater State University”, 9/1/2004 – 8/31/2007, \$306,630. Principal investigator with co-PI’s Dr. Frank Gorga and Dr. Steven Haefner. **(FUNDED)**

Green Chemistry Institute – Petroleum Research Fund Sabbatical Fellow Program, September 1, 2005 – August 31, 2006, \$42,636. **(FUNDED)**

“Integrating sustainability and green chemistry into the departmental culture at Bridgewater State University,” Workshop on *Building the Capacity of Green Chemistry Educators*, June 2007, Washington, DC, \$1,500. **(FUNDED)**.

“Biodiesel Education in America,” a regional consortium between UCONN, University of Rhode Island, and BSU. Submitted 8/08 to the US Department of Agriculture - Cooperative State Research, Education, and Extension Service (USDA-CSREES), \$911,119. **(Not Funded)**

“Green Chemistry Curriculum Development through Engaged Learning for High School Teachers and Students,” Submitted June 2009 to the Camille & Henry Dreyfus Foundation, Special Grant Program in the Chemical Sciences, Co-PI with Dr. Cielito (Tammy) King, \$47,500. **(Not Funded)**

Funded Internal Bridgewater State University Grant Applications

Academic Technology Initiatives Program, “Purchase of Molecular Modeling Software”, \$4,000 (co-written with Dr. Frank Gorga); 1999.

CART Travel Grant for attending American Society of Biochemistry and Molecular Biology meeting, \$195, June 2000.

Faculty/Librarian Research Grant (FLRG), “The Synthesis Of Dialkylester Glutathione Conjugates As Potential Cell Membrane Permeable “Arrows” Against Anti-Cancer Target Enzymes”, \$4,000 (co-PI with Dr. Jeff Bowen), 5/2000 - 12/2000.

CART Travel Grant for attending American Chemical Society National Meeting, March 31 - April 5, 2001, San Diego, CA, \$500.

CART Travel Grant for attending Council on Undergraduate Research Annual Meeting, \$500, June 2002.

CART External Funding Incentive Grant which provided travel funds for three chemistry faculty to attend a grant funding institute sponsored by the Council on Undergraduate Research (CUR), February 23-25, 2003, at George Mason University, \$2,820. The outcome of this CART grant resulted in the award of a \$304,000 NSF-MRI grant to BSU for the purchase of an NMR spectrometer for the chemistry department.

CART Travel Grant for attending the 7th Annual Green Chemistry and Engineering Conference at the National Academy of Sciences, Washington, DC, June 20-26, 2003, \$500.

CART Travel Grant for attending the National Conference on Undergraduate Research, held at the University of Wisconsin-LaCrosse, June 23-27, 2004, \$500.

Faculty/Librarian Research Grant (FLRG), “Green Chemistry Synthesis of Indole-Based Organic Conducting Polymers”, \$6,400, 5/2005 - 12/2005.

CART Travel Grant for attending the 2nd International Conference on Green and Sustainable Chemistry and the 9th Annual Green Chemistry and Engineering Conference, Washington, DC, June 20-24, 2005, \$750.

CART Travel Grant for attending the American Chemical Society National Meeting, Atlanta, GA, March 25-30, 2006, \$750.

Presidential Faculty/Librarian Grant (2006), “Use of Web- and Pod-Casts in Organic Chemistry Classes,” \$3,000.

CART Travel Grant for attending the 11th Annual Green Chemistry & Engineering Conference, Washington, DC, June 2007, \$1200.

CART Travel Grant for attending the American Chemical Society National Meeting, New Orleans, LA, April 2008, \$1200.

CART Travel Grant for attending the American Chemical Society 239th National Meeting, San Francisco, CA, March 2010, \$1240.

Refereed Publications

Edward J. Brush and Gordon A. Hamilton, "Thiol-Glyoxalate Adducts as Substrates for Rat Kidney L- α -Hydroxyacid Oxidase", *Biochem. Biophys. Res. Commun.* (1981) 103, 1194.

Gordon A. Hamilton and Edward J. Brush, "Are Adducts of Thiols with Glyoxylate the Physiological Substrates for Mammalian L- α -Hydroxyacid Oxidase?", *Dev. Biochem. (Flavins and Flavoproteins)* (1982) 21, 244.

Sandra Gunshore, Edward J. Brush, and Gordon A. Hamilton, "Equilibrium Constants for the Formation of Glyoxylate Thiohemiacetals and Kinetic Constants for their Oxidation by O₂ Catalyzed by L- α -Hydroxyacid Oxidase", *Bioorganic Chemistry* (1985) 13, 1.

Edward J. Brush, Koren A. Lipsett, and John W. Kozarich, "Inactivation of *Escherichia coli* Pyruvate Formate-Lyase by Hypophosphite: Evidence for a Rate-Limiting Phosphorus-Hydrogen Bond Cleavage", *Biochemistry* (1988) 27, 2217.

Lucy U. DeMario, Edward J. Brush, and John W. Kozarich, "Mechanism-Based Inactivation of Pyruvate Formate-Lyase by Acetylphosphinate: Evidence for Carbon-Phosphorus Bond Cleavage", *J. Amer. Chem. Soc.* (1991) 113, 4341.

James A. Landro, Edward J. Brush, and John W. Kozarich, "Isomerization of (R)- and (S)-Glutathiolactaldehydes by Glyoxalase I: The Case for Dichotomous Stereochemical Behavior in a Single Active Site", *Biochemistry* (1992) 31, 6069.

Edward J. Brush and John W. Kozarich, in *The Enzymes - Mechanisms of Catalysis*, 3rd edition, (Sigman, ed.), Vol. 20, Chap. 8, "Enzymic Free Radical Mechanisms", Academic Press (1992).

Catherine F. Yang and Edward J. Brush, "A Spectrophotometric Assay for α -Ketoaldehydes Using Horse Liver Alcohol Dehydrogenase", *Analytical Biochemistry* (1993) 214, 124.

Zahoui Liu, Yi Wang, Samuel P. Kounaves, and Edward J. Brush, "The Determination of Organo Nitriles Using Enzyme-Based Selectivity Mechanisms. I - An Ammonia GSE Based Sensor for Benzotrile", *Analytical Chemistry* (1993) 65, 3134.

Ioanna P. Petrounia, Joel Goldberg, and Edward J. Brush, "Transient Inactivation of Almond Mandelonitrile Lyase by 3-Methyleneoxindole: A Photooxidation Product of the Natural Plant Hormone Indole-3-Acetic Acid", *Biochemistry* (1994) 33, 2891.

T.Z. Liu, Yi Wang, Samuel P. Kounaves, and Edward J. Brush, "Determination of Organonitriles Using Enzyme-Based Selectivity Mechanisms: 2. A Nitrilase-Modified Glassy Carbon Microelectrode Sensor for Benzotrile", *Analytical Chemistry* (1995) 67, 1679.

Nancy E. Pettigrew, Edward J. Brush, and Roberta F. Colman, "3-Methyleneoxindole: An Affinity Label of Glutathione S-Transferase pi Which Targets Tryptophan 38," (2001) *Biochemistry*, 40, 7549-7558.

Edward Brush, Michelle Cox, Andrew Harris, and Lee Torda, "Undergraduate Research as Faculty Development," (2010) *CUR Quarterly*, 31 (1), 11-16.

Non-Refereed Publications

Edward Brush, "Less Hazardous Chemical Synthesis" (2005) *NEACT Journal*, 23(2), 7-9.

Edward Brush, Essay on "Biocatalysis: Nature's Tools for Chemical Synthesis" (with web exercises), in *Chemistry for Changing Times*, (11th Edition), Hill and Kolb, Prentice Hall (2006).

Edward Brush, Essay on "Green Chemistry and Human Health" (with instructors notes and web exercises), in *Chemistry for Changing Times*, (12th Edition), Hill and Kolb, Prentice Hall (2009).

"Color me SAFE. Color me GREEN. Bridgewater educates tomorrow's green chemists to help preserve our ailing planet for future generations." Article written by Tiffany Bagby in the Summer 2009 issue of *BRIDGEWATER* (BSU alumni magazine).

Conference Presentations

Edward J. Brush, "A Chemistry-Based OutReach Program", Bridgewater Institute on Engaging the External Environment, November 1998.

Catherine F. Yang and Edward J. Brush, "Inactivation of Almond Mandelonitrile Lyase by Phenylglyoxal", Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways, Meriden, New Hampshire, July 1990.

Catherine F. Yang and Edward J. Brush, "Inactivation of Mandelonitrile Lyase by Active Site-Directed Reagents", Gordon Conference on Enzymes, Coenzymes and Metabolic Pathways, Meriden, New Hampshire, July 1991.

Catherine F. Yang and Edward J. Brush, "Mechanistic Studies on Mandelonitrile Lyase by Covalent and Non-Covalent Modification", American Chemical Society National Meeting, New York City, August, 1991.

Catherine F. Yang and Edward J. Brush, "Reversible and Irreversible Inhibition of Mandelonitrile Lyase By Auxinic Plant Growth Regulators", American Chemical Society Northeast Regional Meeting, Syracuse, New York, June 1992.

Ioanna P. Petrounia, Catherine F. Yang, Jennifer Wong and Edward J. Brush, "Reversible and Irreversible Inhibition of Mandelonitrile Lyase by Auxinic Plant Growth Regulators", Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways, Meriden, New Hampshire, July 1992.

Ioanna P. Petrounia, Catherine F. Yang and Edward J. Brush "Light Induced Inactivation of Mandelonitrile Lyase by the Plant Hormone Indole-3-Acetic Acid", Enzyme Mechanisms Conference, Key West, Florida, January 1993.

Ioanna P. Petrounia, Joel Goldberg and Edward J. Brush, "Light-Induced Irreversible Inhibition Of Mandelonitrile Lyase By Indole-3-Acetic Acid", American Chemical Society Northeast Regional Meeting, Northeastern University, June 1993.

Yi Wang and Edward J. Brush, "Initial Characterization Of The Chemical Reaction Mechanism Of The Nitrilase-Catalyzed Reaction", American Chemical Society Northeast Regional Meeting, Northeastern University, June 1993.

Ioanna P. Petrounia, Joel Goldberg and Edward J. Brush, "Pseudo-Irreversible Inactivation of Mandelonitrile Lyase by 3-Methyleneoxindole - A Metabolite of the Phytohormone Indole-3-Acetic Acid", Gordon Conference on Enzymes, Coenzymes and Metabolic Pathways, Meriden, NH, July 1993.

Ioanna P. Petrounia and Edward J. Brush, "Transient Inactivation of Mandelonitrile Lyase by 3-Methyleneoxindole - Mechanistic Insights From Studies on Model Compounds", Gordon Conference on Enzymes, Coenzymes and Metabolic Pathways, Meriden, NH, July 1994.

Edward J. Brush and Joel Goldberg, "A New Assay For Almond Mandelonitrile Lyase Utilizing Horse Liver Alcohol Dehydrogenase And Its Potential For The Resolution of Racemic Mandelonitrile", Gordon Research Conference on Biocatalysis, Meriden, NH, July 1996.

Edward J. Brush and Lisa Maciorakowski, "Synthesis And Characterization Of The Glutathione Conjugate With 3-Methyleneoxindole As A Potential Inhibitor Of Glyoxalase I", 17th International Congress on Biochemistry and Molecular Biology, August 1997.

Edward J. Brush and Lisa Maciorakowski, "Biocatalytic Activation of a Potential Pro-Drug by Glyoxalase I", Gordon Research Conference on Biocatalysis, New Hampshire, July 1998.

Edward J. Brush and Lisa Maciorakowski, "Synthesis of the Glutathione Conjugate With 3-Methyleneoxindole - A Competitive Inhibitor and Substrate of Human Erythrocyte Glyoxalase I", American Chemical Society National Meeting, Boston, MA, August 1998.

Edward J. Brush, "A Chemistry-Based Outreach Program To Inspire And Excite Elementary And Secondary School Students About Science", Science, Technology, Engineering and Mathematics Teacher Education (STEMTEC) Summer Institute, UMASS Amherst, July 1999.

Jamie Anderson, Steve Bates, Mike Henderson, Bill Silva, Chakara White, and Edward J. Brush, "A Chemistry-Based Outreach Program To Inspire And Excite Elementary And Secondary School Students About Science", Massachusetts Association of Science Teachers (MAST), November 1999.

Edward J. Brush, "A Chemistry-Based Outreach Program for Elementary, Middle, and Secondary School Students and Pre-Service Science Teachers", Bridgewater Institute on Community Service and Service Learning, February 2000.

Edward J. Brush, "A Unique Service-Learning Experience for Pre-Service Science Teachers: A Chemistry-Based Outreach Program", CART Celebration IV, May 2000.

Edward J. Brush, "The Synthesis of a Unique Chemical Arrow to Target Glutathione-Dependent Anti-Cancer Enzymes", CART Celebration IV, May 2000.

Ed Brush, Andrew Harris, Peter Saccocia, Ann Brunjes, and Kevin Curry, "Fostering Student Research and Developing the Honors Program", Panel Presentation at CART Celebration IV, May 2000.

Edward J. Brush and Lisa A. Maciorakowski, "Synthesis Of The Glutathione Conjugate With 3-Methyleneoxindole - A Competitive Inhibitor And Substrate Of Human Erythrocyte Glyoxalase I", American Society of Biochemistry and Molecular Biology, June 2000.

Edward J. Brush, "Initiating Student-Active Learning in the Chemical Principles Course at Bridgewater State University", STEMTEC Pathways to Change conference, Hampshire College, June 2000.

Edward J. Brush and Lisa A. Maciorakowski, "Synthesis Of The Glutathione Conjugate With 3-Methyleneoxindole - A Competitive Inhibitor And Substrate Of Glyoxalase I", American Chemical Society 29th Northeast Regional Meeting, University of Connecticut, June 2000.

Edward J. Brush, Steve Godin, and Jeff Bowen, "Synthesis Of Dialkylester GSH Conjugates With 3-Methyleneoxindole: Potential Cell Membrane Permeable Prodrug Inhibitors Of GSH-Dependent Anti-Cancer Target Enzymes", ACS National Meeting, San Diego, April 2001.

Edward J. Brush, Jeff Bowen, and Steve Godin, "Synthesis Of The Diethylester Glutathione Conjugate With 3-Methyleneoxindole: A Potential Prodrug Inhibitor Of Glutathione-Dependent Enzymes", CART Celebration V, May 2001.

Edward J. Brush, Steve Godin, and Jeff Bowen, "Synthesis Of The Diethylester Glutathione Conjugate With 3-Methyleneoxindole: A Potential Prodrug Inhibitor Of Glutathione-Dependent Enzymes", Gordon Research Conference on Bioorganic Chemistry, June 2001.

Edward J. Brush, "Getting Started With Student-Active Learning in the Introductory Chemistry Curriculum," American Chemical Society Northeastern Regional Meeting, University of New Hampshire, June 24-27, 2001.

Edward J. Brush, Steve Godin, and Jeff Bowen, "Synthesis Of The Diethylester Glutathione Conjugate With 3-Methyleneoxindole: A Potential Prodrug Inhibitor Of Glutathione-Dependent Enzymes," American Chemical Society Northeastern Regional Meeting, University of New Hampshire, June 24-27, 2001.

Andrew Harris and Edward J. Brush, "Developing a Successful Campus-Wide Undergraduate Research Program at Bridgewater State University", National Conference on Undergraduate Research (NCUR), University of Wisconsin, Whitewater, April 24-27, 2002.

Edward Brush, Brendan Burke, Sandra Clark, Kevin Curry, Celito De Ramos-King and Kimberly Smith, "NCUR/Lancy 2001 Report: Impact of Regional Development on Natural Resources in Bridgewater, MA", Panel Presentation at the CART Celebration VI, May 2002.

Edward J. Brush, "Undergraduate Research at Bridgewater State University: Bioorganic and Green Chemistry", 9th National Conference of the Council on Undergraduate Research, Connecticut College, June 19-22, 2002.

Andrew Harris and Edward J. Brush, "Developing a Successful Campus-Wide Undergraduate Research Program at Bridgewater State University", 9th National Conference of the Council on Undergraduate Research, Connecticut College, June 19-22, 2002.

Edward J. Brush, "Undergraduate Research and its Impact on the Educational Culture in the Biological and Physical Sciences at Bridgewater State University", 9th National Conference of the Council on Undergraduate Research, Connecticut College, June 19-22, 2002.

Edward J. Brush, "The impact of gas chromatography-mass spectrometry on the chemistry curriculum at Bridgewater State University", American Chemical Society National Meeting, Hynes Convention Center, Boston, MA, August 18-22, 2002.

Edward J. Brush, "Introducing Green Chemistry into the organic chemistry teaching and research curriculum at Bridgewater State University", American Chemical Society National Meeting, Hynes Convention Center, Boston, MA, August 18-22, 2002.

Edward J. Brush, Asako Enomoto, and Takafumi Iba, "Synthesis of ethyl-3-bromooxindoleacetate as a potential mechanism-based inhibitor of cysteine proteases", American Chemical Society National Meeting, Hynes Convention Center, Boston, MA, August 18-22, 2002.

Edward J. Brush, Frank Gorga, Arthur Lizie, and Lee Torda, "Undergraduate research as program and goal: What works and what doesn't", Panel Presentation at the 17th National Conference on Undergraduate Research (NCUR), University of Utah, March 13-15, 2003.

Edward J. Brush and Kevin Curry, "Impact of the NCUR/Lancy initiative at Bridgewater State University", 17th National Conference on Undergraduate Research (NCUR), University of Utah, March 13-15, 2003.

Edward Brush, Andrew Harris, Ann Brunjes, Kevin Curry, and Sandra Nearing, "Research Methods Courses in the Undergraduate Curriculum," Panel Presentation at the CART Celebration, May 2003.

Edward J. Brush, "Introducing Green Chemistry into organic chemistry teaching and research curriculum at Bridgewater State University", 7th Annual Green Chemistry and Engineering Conference, The National Academies, Washington, D.C., June 23-26, 2003.

Edward J. Brush, "Informal education at Bridgewater State University through community outreach, chemical demonstrations and green chemistry research," American Chemical Society National Meeting, Anaheim, CA, March 28-April 1, 2004.

Pamela Hayes-Bohanan, Edward J. Brush, and James Hayes-Bohanan, "Greening the Campus," Panel Presentation at the Bridgewater State University CART Celebration, May 2004.

Edward J. Brush, "Introducing Green Chemistry into Undergraduate Teaching and Research at Bridgewater State University," Council on Undergraduate Research - 10th National Conference, June 23-27, 2004, University of Wisconsin, La Crosse.

Edward J. Brush, "Discovering Green Chemistry with Undergraduate Students Through Less Hazardous Chemical Synthesis," Invited speaker at the Gordon Research Conference on Green Chemistry, July 4 – 9, 2004, Roger Williams University, RI.

Pam Civie, Amy Cannon and Ed Brush, "Green Chemistry and Educational Issues," Panel Discussion at the 4th UMASS Green Chemistry Conference, January 13-14, 2005, UMASS Dartmouth.

Edward J. Brush, "Progressive introduction of green chemistry into undergraduate organic chemistry research, lab and lecture curriculum at Bridgewater State University," 229th American Chemical Society National Meeting, San Diego, CA, March 13-17, 2005.

Edward J. Brush, "Green chemistry curriculum applications in teaching and research at Bridgewater State University," 2nd International Conference on Green and Sustainable Chemistry and the 9th Annual Green Chemistry and Engineering Conference, Washington, DC, June 20-24, 2005.

Edward J. Brush and Jesse Miller, "Green chemistry synthesis of oxindole derivatives: 3-Bromooxindole acetic acid and 3-methyleneoxindole," American Chemical Society National Meeting, Atlanta, GA, March 25-30, 2006.

Edward J. Brush, Cielito DeRamos King, Kevin Curry, and Donald Padgett, "Hosting a multidisciplinary undergraduate environmental symposium at Bridgewater State University: Administration, impact, and funding," American Chemical Society National Meeting, Atlanta, GA, March 25-30, 2006.

Edward J. Brush, "Green Chemistry Institute Sabbatical/Fellow Program: Valuable research experiences and collaborations with the GCI," Biennial Conference on Chemical Education, Purdue Univ., July, 2006.

Edward Brush, Edward Deveney, Arthur Lizie, and Ronald Pitt, "Overcoming challenges and barriers to sustaining a research culture through a community of scholarship," Council on Undergraduate Research National Meeting, DePauw University, Greencastle, Indiana, June 23-27, 2006.

Edward J. Brush, "Incorporating green chemistry research projects and outreach activities into the undergraduate chemistry curriculum," Council on Undergraduate Research National Meeting, DePauw University, Greencastle, Indiana, June 23-27, 2006.

Edward J. Brush, "Green Chemistry Institute Sabbatical/Fellow Program: Valuable research experiences and collaborations with the GCI," 10th Annual Green Chemistry & Engineering Conference, Capital Hilton, Washington, DC, June 27 – July 3, 2006.

Edward J. Brush, "Incorporating green and sustainable chemistry into the undergraduate curriculum: Pedagogy, research, and outreach activities," Association for the Advancement of Sustainability in Higher Education (AASHE) 2006 Conference, Arizona State University, Tempe, AZ, October 4-6, 2006.

Edward J. Brush, "Integrating sustainability into the STEM disciplines at Bridgewater State University," American Chemical Society National Meeting, Boston, MA, August 2007.

Edward J. Brush, "Integrating green and sustainable chemistry at Bridgewater State University: From classroom to lab to office operations," Am. Chemical Society National Meeting, New Orleans, April 2008.

"Building Green Teaching Green," Panel Presentation at the Bridgewater State University CART Celebration, May 2009, Martina Arndt, Ed Brush, Tammy King, Rob Hellstrom, Mike Krol.

Edward J. Brush, "Green chemistry and institutional sustainability: Impact on curriculum, research, outreach, and laboratory design," Am. Chemical Society National Meeting, San Francisco, March 2010.

Invited Lectures and Seminars

College of The Holy Cross, Dept. of Chemistry, "The Enzyme Chemistry of Organo Nitriles", March 1990.

Hamilton College, Dept. of Chemistry, "Mechanistic Problems in Bioorganic Chemistry", November 1990.

Merrimack College, Department of Chemistry, "Mechanisms of Cyanogenesis", February 1991.

University of Maryland, Department of Chemistry and Biochemistry, "Enzymes of Cyanogenesis - The Oxynitrilase Reaction", November 1991.

University of Lowell, Department of Chemistry, "Enzymes of Cyanogenesis - The Oxynitrilase Reaction", November 1991.

Colby College, Department of Chemistry, "Enzymology of Nitriles, Cyanide and Cyanohydrins", November 1991.

UMASS-Dartmouth, Department of Chemistry, "Enzymology of Nitriles, Cyanide and Cyanohydrins", February 1992.

State University of New York at Stony Brook, Department of Chemistry, "Enzymology of Nitriles, Cyanide and Cyanohydrins", February 1992.

Saint Michael's College, Department of Chemistry, "Enzymology of Nitriles, Cyanide and Cyanohydrins", October 1992.

Clark Univ., Department of Chemistry, "Enzymology of Nitriles, Cyanide and Cyanohydrins", Nov. 1992.

Saint Anselms College, Department of Chemistry, "Transient Inactivation of Mandelonitrile lyase by 3-Methyleneoxindole", February 1996.

Barnard College, Department of Chemistry, "Transient Inactivation of Mandelonitrile lyase by 3-Methyleneoxindole", February 1996.

Kutztown University, Department of Physical Sciences, "Transient Inactivation of Mandelonitrile lyase by 3-Methyleneoxindole", March 1996.

Saint Josephs University (PA), Department of Chemistry, "Transient Inactivation of Mandelonitrile lyase by 3-Methyleneoxindole", March 1996.

UMASS Amherst "STEM TALK" seminar, "Getting Started with Student-Active Learning in the Introductory Chemistry Curriculum", October 17, 2000.

UMASS-Dartmouth, Department of Chemistry, "Synthesis and Evaluation of Novel Inhibitors for Glutathione-Dependent Enzymes", April 10, 2002.

University of New Hampshire, Department of Chemistry, "NSF-Sponsored Curriculum Reform and Bioorganic Research at Bridgewater State University", October 30, 2003.

Bridgewater State University, Science Faculty Seminar Series, "It IS easy being green! Student-driven green chemistry research and classroom pedagogy at BSU," March 31, 2005.

UMASS-Lowell, Center for Green Chemistry, "Investigating green chemistry approaches toward the synthesis of indole derivatives and conducting organic polymers," September 12, 2005.

American Chemical Society – Green Chemistry Institute (Washington, DC), "Investigating green chemistry approaches toward the synthesis of indole derivatives and conducting organic polymers," May 11, 2006.

East Bridgewater Lions Club, "Global Warming," with Dr. Jeff Williams, February 2007.

3rd Annual Conference on Health and Biotechnological Topics, "Green Chemistry and Biotechnology," Bridgewater State University (CASE), February 7, 2008.

Green Awareness Day at Bridgewater-Raynham High School, "Green Chemistry," April 17, 2009.

Undergraduate Research Students – Bridgewater State University (year graduated and career paths)

Zineb Brine (2000, Tufts University Dental School)

Mike Bradley (1999, working in industry)

Louis Crowley (2001, Ph.D. in Biochemistry, University of South Florida, Antigenics, Inc.)

Steve Godin (2001, Ph.D. in Toxicology, University of North Carolina, Stiefel Laboratories, Inc.)

Takafumi Iba (2001, Ph.D. in Chemistry at Purdue University)

Katie McCusker (2001, Ph.D. program in Biochemistry/Molecular Biology, UMASS Amherst)

Hillary Thomas (2001, Univ. of Health Sciences College of Osteopathic Medicine, Kansas City)

Melissa Thompson (2001, career unknown)

Carmen Amaral (2002, career unknown)

Justin Whitfield (2002, Ph.D. in Green Chem. (UMASS Lowell), Warner-Babcock Inst. Green chemistry)

Timothy Gay (2003, Ph.D. program in Chemistry at Boston University)

Asako Enomoto (2003, career unknown)

Nabiha Abid (2003, M.Sc. program in Biology, UMASS Boston)

Taylor Balin (2003, M.Sc. program in Green Chemistry, UMASS Lowell)

Tricia Shaw-Nelson (2004, Genzyme)

Evan Broderick (2005, currently serving in the armed forces)

Jesse Miller (2005, Ph.D. program in Chemistry, Carnegie Mellon University)

Karen DeBalsi (2006, Ph.D. program in Biomedicine, Duke University)

Alison Erbeck (2006, Scolr Pharma, Inc.)

David Mofford (2006, plans on applying to medical school)

Bethany Masten (2006, Ph.D. program in Chemistry, Carnegie Mellon University)

Julie Martell (2009, Ph.D. program in Chemistry, Boston College)

Amanda Bragan (2009, High School Teacher in Dedham)
Maely Cabral (2010, plans on attending graduate school)
Robert Russi (2010, plans on attending graduate school)
Michel Darazi (2011, plans to apply to medical school)
Joshua Weaver (2011, plans to apply to medical school)

Honors Thesis Directed

Stephen J. Godin – Shea Scholar (2001), “The Synthesis and Evaluation of Possible Cell Membrane Permeable Compounds with Potential Anti-Cancer Properties,” co-directed with Dr. Jeffrey Bowen.

Bethany Masten – Shea Scholar (2006), “Surge of Green: A Sustainable Approach to Conductive Plastics.” *The Undergraduate Review: A Journal of Undergraduate Research and Creative Work*, **III**, 161-167 (2007).

BSU Undergraduate Research Students – Conference Presentations

Carmen Amaral, Jamie Anderson, Zineb Brine, Tim Caylor, Louis Crowley, Jason Fortin, Mike Henderson, Denise Logan, Maureen McGrain, Bill Silva, Hillary Thomas, Melissa Thompson, Chakara White, and Edward J. Brush, “A Chemistry-Based Outreach Program To Inspire And Excite Elementary And Secondary School Students About Science”, 5th Annual Conference on Undergraduate Research, Scholarly, Creative, and Public Service Activities, Boston, MA, April 1999.

Michael D. Bradley and Edward J. Brush, “Biocatalytic Resolution of Racemic Cyanohydrins Using Immobilized Oxynitrilases”, 5th Annual Conference on Undergraduate Research, Scholarly, Creative, and Public Service Activities, Boston, MA, April 1999.

Catherine McCusker and Edward J. Brush, “Synthesis of the 3-Methyleneoxindole-Glutathione Conjugate, and its Evaluation As An Inhibitor And Possible Substrate Of The Glutathione-S-Transferases”, 5th Annual Conference on Undergraduate Research, Scholarly, Creative, and Public Service Activities, Boston, MA, April 1999.

Steve Godin, Melissa Thompson, Louis Crowley, and Edward J. Brush, “Synthesis And Characterization Of The Conjugate Formed Between Glutathione And 3-Methyleneoxindole: A Potential Inhibitor Of Glutathione-Dependent Anti-Cancer Target Enzymes”, 6th Annual Conference on Undergraduate Research, Scholarly, Creative, and Public Service Activities, Boston, MA, April 2000.

Catherine D. McCusker and Edward J. Brush, “Evaluation Of The Glutathione Conjugate With 3-Methyleneoxindole As A Specific Inhibitor Of Rat Liver Glutathione-S-Transferase: An Anti-Cancer Target Enzyme”, 6th Annual Conference on Undergraduate Research, Scholarly, Creative, and Public Service Activities, Boston, MA, April 2000.

Louis Crowley, Hillary Thomas, Taylor Balin, Lynn Brundage, and Edward J. Brush, “A Chemistry-Based Outreach Program For Elementary And Secondary School Students And Pre-Service Science Teachers”, 6th Annual Conference on Undergraduate Research, Scholarly, Creative, and Public Service Activities, Boston, MA, April 2000.

Carmen Amaral, Louis Crowley, and Edward J. Brush, “A Chemistry-Based Outreach Program For Elementary, Middle, And Secondary School Students And Pre-Service Science Teachers”, American Chemical Society Northeast Regional Meeting, University of Connecticut, June 2000.

Stephen J. Godin, Louis Crowley, Jeffrey Bowen, and Edward J. Brush, “The Synthesis of Diethylester Glutathione Conjugates as potential Cell Membrane Permeable “Arrows” Against Anti-Cancer Target Enzymes”, American Chemical Society Northeast Regional Meeting, University of Connecticut, June 2000.

Stephen J. Godin, Shea Scholar Presentation, “The Synthesis and Evaluation of the Diethylester Conjugate

of Glutathione and 3-Methyleneoxindole”, September 2000.

Stephen Godin, Edward J. Brush, and Jeffrey Bowen, “Synthesis And Evaluation Of Glutathione-3-Methyleneoxindole Diethylester: A Potential Prodrug Inhibitor Of The Anticancer Target Enzyme Glyoxalase I”. 5th Annual Undergraduate Poster Session on Capitol Hill, Washington, D.C., March, 2001.

Stephen J. Godin, Edward J. Brush, and Jeffrey Bowen, “Synthesis Of Glutathione Diester Conjugates With 3-Methyleneoxindole As Potential Prodrug Inhibitors Of Anti-Cancer Target Enzymes”. American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

Takafumi Iba and Edward J. Brush, “Synthesis Of Ethyl-3-Bromooxindoleacetate As A Potential Inhibitor Of Serine And Thiol Proteases”. Am. Chemical Society National Meeting, San Diego, CA, April, 2001.

Hillary Thomas and Edward J. Brush, “Evaluation Of The Inhibition Of Rat Liver Glutathione-S-Transferase By The Glutathione Conjugate With 3-Methyleneoxindole”. American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

Carmen Amaral and Edward J. Brush, “A Potential Method For The Kinetic Resolution Of Racemic Mandelonitrile”, American Chemical Society Northeastern Regional Meeting, University of New Hampshire, June 24-27, 2001.

Takafumi Iba, Asako Enomoto, and Edward J. Brush, “Synthesis Of Ethyl-3-Bromooxindoleacetate As A Potential Inhibitor Of Cysteine Proteases”, American Chemical Society Northeastern Regional Meeting, University of New Hampshire, June 24-27, 2001.

Hillary Thomas and Edward J. Brush, “Evaluation Of The Inhibition Of Rat Liver Glutathione-S-Transferase By The Glutathione Conjugate With 3-Methyleneoxindole”, American Chemical Society Northeastern Regional Meeting, University of New Hampshire, June 24-27, 2001.

Justin Whitfield, Taylor Balin and Edward J. Brush, “Modifications To Existing Organic Chemistry Laboratories In The Interest Of Green Chemistry”, Massachusetts Green Chemistry Symposium, UMASS Amherst, October 2001.

Carmen Amaral and Edward J. Brush, “Biocatalytic kinetic resolution of racemic mandelonitrile under biphasic reaction conditions”, 16th National Conference on Undergraduate Research (NCUR), University of Wisconsin, Whitewater, April 24-27, 2002.

Taylor Balin and Edward J. Brush, “Green chemistry modifications to the aldol condensation”, 16th National Conference on Undergraduate Research (NCUR), Univ. of Wisconsin, Whitewater, April, 2002.

Asako Enomoto and Edward J. Brush, “Synthesis of ethyl-3-bromooxindoleacetate as a potential mechanism-based inhibitor of cysteine proteases”, 16th National Conference on Undergraduate Research (NCUR), University of Wisconsin, Whitewater, April 24-27, 2002.

Justin Whitfield and Edward J. Brush, “Green chemistry modifications to the Grignard reaction”, 16th National Conference on Undergraduate Research (NCUR), Univ. of Wisconsin, Whitewater, April, 2002.

Jeremy Perry, Timothy Gay and Edward J. Brush, “Green Chemistry research and community outreach at Bridgewater State University”, American Chemical Society National Meeting, Hynes Convention Center, Boston, MA, August 18-22, 2002.

Timothy Gay and Edward J. Brush, “Green Chemistry laboratory modifications: Addition of bromine to alkenes”, Am. Chemical Society National Meeting, Hynes Convention Center, Boston, MA, August, 2002.

Taylor B. Balin and Edward J. Brush, "Green Chemistry modifications to the aldol condensation", American Chemical Society National Meeting, Hynes Convention Center, Boston, MA, August, 2002.

Carmen Amaral and Edward J. Brush, "Biocatalytic kinetic resolution of racemic mandelonitrile under biphasic reaction conditions", American Chemical Society National Meeting, Hynes Convention Center, Boston, MA, August 18-22, 2002.

Nabiha Abid, Asako Enomoto and Edward J. Brush, "Synthesis of ethyl-3-bromooxindoleacetate as a potential mechanism-based inhibitor of cysteine proteases", 17th National Conference on Undergraduate Research (NCUR), University of Utah, March 13-15, 2003.

Taylor Balin and Edward J. Brush, "Yeast catalyzed reduction of ethyl acetoacetate", 17th National Conference on Undergraduate Research (NCUR), University of Utah, March 13-15, 2003.

Timothy Gay and Edward J. Brush, "Stereoselective electrophilic addition by tungstate catalysts and peroxidase enzymes: The study of an environmentally safe alkene bromination", 17th National Conference on Undergraduate Research (NCUR), University of Utah, March 13-15, 2003.

Karen DeBalsi and Edward J. Brush, "Synthesis, purification, and characterization of glutathione dialkylester conjugates with 3-methyleneoxindole," American Chemical Society National Meeting, Anaheim, CA, March 28 – April 1, 2004.

Jeremy Perry, Jesse Miller and Edward J. Brush, "Green chemistry synthesis of 3-methyleneoxindole from indoleacetic acid," American Chemical Society National Meeting, Anaheim, CA, 2004.

Tricia Shaw-Nelson and Edward J. Brush, "Synthesis of S-glutathionyl-3-bromooxindole acetic acid as a potential inhibitor of Glyoxalase II," American Chemical Society National Meeting, Anaheim, CA, March 28 – April 1, 2004.

Alison N. Erbeck and Edward J. Brush, "Synthesis of S-glutathionyl-3-bromooxindole acetic acid as a potential Trojan Horse inhibitor of glyoxalase II," 229th American Chemical Society National Meeting, San Diego, CA, March 13-17, 2005.

Karen DeBalsi, Jeff Bowen and Ed Brush, "Synthesis, purification, characterization, and biological evaluation of dialkylester glutathione conjugates with 3-methyleneoxindole as potential therapeutic agents," 229th American Chemical Society National Meeting, San Diego, CA, March 13-17, 2005.

Jesse Miller and Ed Brush, "Green chemistry synthesis of 3-bromooxindole-3-acetic acid: An intermediate to a number of indole derived therapeutic enzyme inhibitors," 229th American Chemical Society National Meeting, San Diego, CA, March 13-17, 2005.

Evan Broderick and Edward J. Brush, "Application of ionic liquids as green solvents for the synthesis of 3-bromooxindole-3-acetic acid," Am. Chemical Society National Meeting, San Diego, CA, March, 2005.

Alison N. Erbeck and Edward J. Brush, "Synthesis of indole and oxindole derivatives of glutathione as potential inhibitors of glyoxalase II," American Chemical Society National Meeting, Atlanta, GA, March 25-30, 2006.

David M. Mofford and Edward J. Brush, "Design, synthesis and evaluation of indole and oxindole aspartic acid derivatives as potential caspase inhibitors," American Chemical Society National Meeting, Atlanta, GA, March 25-30, 2006.

Alison N. Erbeck and Edward J. Brush, "Synthesis of indole and oxindole derivatives of glutathione as potential inhibitors of glyoxalase II," The 8th Annual Northeast Student Chemistry Research Conference,

MIT, Cambridge, MA, April 22, 2006.

David M. Mofford and Edward J. Brush, "Design, synthesis and evaluation of indole and oxindole aspartic acid derivatives as potential caspase inhibitors," The 8th Annual Northeast Student Chemistry Research Conference, MIT, Cambridge, MA, April 22, 2006.

Bethany A. Masten and Edward J. Brush, "Surge of green: A proposed sustainable approach to conductive polymers," 10th Annual Green Chemistry & Engineering Conference, Capital Hilton, Washington, DC, June 27 – July 3, 2006.

Julianne Martell and Edward J. Brush, "Development of analytical methods to evaluate the purity of biodiesel produced from waste vegetable oils," Northeastern Regional Meeting of the American Chemical Society, Burlington, VT, June 2008.

Maely Cabral and Edward J. Brush, "Preparing Warriors to Battle Disease with a Trojan-Horse Attack on the Model Cysteine Protease Papain," Northeastern Regional Meeting of the American Chemical Society, Burlington, VT, June 2008.

Amanda Bragan and Edward J. Brush, "Investigating the cost-benefit feasibility of producing biodiesel from waste vegetable oil," Northeastern Regional Meeting of the American Chemical Society, Burlington, VT, June 2008.

Julianne Martell, Amanda Bragan and Edward J. Brush, "Developing research skills and work ethic toward our future aspirations through undergraduate research on biodiesel," American Chemical Society National Meeting, Salt Lake City, Utah, March 2009.

Amanda Bragan and Edward J. Brush, "Determining the feasibility of producing biodiesel from waste vegetable oil through cost-benefit and SWOT analyses," American Chemical Society National Meeting, Salt Lake City, Utah, March 2009.

Maely Cabral and Edward J. Brush, "Inhibitor design by Trojan horse attack on the model cysteine protease papain," American Chemical Society National Meeting, Salt Lake City, Utah, March 2009.

Julianne Martell and Edward J. Brush, "Development of ¹H-NMR and ASTM-based methods to evaluate the analytical purity of biodiesel produced from waste vegetable oils," American Chemical Society National Meeting, Salt Lake City, Utah, March 2009.

Teaching - Courses Taught at Bridgewater State University (1998-present)

CHEM 131, Survey of Chemistry (lecture and lab), one semester (evening)
CHEM 135, Honors Colloquium – Introduction to Science Research, Campus Sustainability Issues
CHEM 141-142, Chemical Principles I&II – Lecture
CHEM 343-344, Introductory Organic Chemistry I&II - Lecture and Laboratory
CHEM 344L, Honors Organic Chemistry Laboratory
CHEM 390, Research in Chemistry
CHEM 485, Honors Thesis in Chemistry
CHEM 490, Special Topics in Chemistry: Green Chemistry (with Dr. Tammy De Ramos-King)
CHEM 492, Laboratory Techniques (with Dr. Tammy De Ramos-King)

Teaching Initiatives – Chemistry-Based Outreach Program

Since 1999, over 150 Bridgewater State University science students have visited dozens of local elementary, middle, and secondary schools throughout Southeastern Massachusetts performing chemistry "Magic" with school children. The goals of the Chemistry OutReach Program are to inspire curiosity and

excitement; show kids that science is fun, safe and important; demonstrate that men and women can be scientists; and to provide a service-learning opportunity for BSU students considering science teaching as a career. BSU research students are bringing the advances of Green Chemistry to high school students through structured group activities focused on the Green Chemistry research at BSU and elsewhere. The goal of the Green Chemistry OutReach is to make students more aware of the current state of the environment, the Green Chemistry advances that have been brought forth, and what they can do as future scientists to promote and practice more chemically “sustainable” attitudes.

Teaching Initiatives – Research and Education

At primarily undergraduate institutions, research and teaching go hand in hand. Research adds to the vitality of the faculty by bringing new information, new knowledge and a new enthusiasm for their classroom subjects. The students in the classroom see the practical side of what they are learning, by applying the facts to solving real world problems. The greatest impact is on the students participating in research. Students work side-by-side with a faculty mentor solving problems, discovering new knowledge, and making a new contribution to the discipline. These students develop the self-confidence and skills needed to conduct research in graduate school, and in their professional careers.

Significant Administrative Responsibilities – Bridgewater State University

Chair, Department of Chemical Sciences, September 2006 – June 2009

Co-founder and Co-Coordinator, Center for Sustainability, September 2006 – present

Co-founder and Co-Coordinator, Adrian Tinsley Program for Undergraduate Research, 2001-2005

Service and Other Campus Activities – Bridgewater State University

- Member, Department search committee for the Physical Chemist vacancy (C. Noda), 1998-99
- Member of the Pre-Medical Advisory Committee, 1999-present
- CART Advisory Board (including Travel Grant sub-committee and FLRG Grant Review Committee), September 2000-May 2003
- Departmental Honors coordinator, 2000 - 2005
- Faculty judge at the 5th Annual Conference on Undergraduate Research, Scholarly, Creative, and Public Service Activities, April 1999
- Judge for the Annual South Shore Regional Science fair, spring 2000 – present
- New Student Orientation, Academic Advising 101-102, June 2000-2004
- Bridgewater State University Leadership Institute, 2001
- *Conversations With the College*, BSU Undergraduate Research Program with Andrew Harris, 2001
- Member, Department search committee for Inorganic Chemist vacancy (S. Haefner), 2001-02
- Conducted classroom visits for Physics faculty Arndt and Kuhl, 2001
- Committee on Tenure, Ms. Deborah Sanford, 2001
- Classroom visits for Biology faculty Bowen, Carson, Krevosky, Mancini, Padgett and Shan, 2002
- Chair, Committee on Tenure for Dr. Gregory Nelson, 2002
- Chair, Committee on Tenure for Dr. Michael Farley, 2003
- Guest speaker, Bridgewater State University Parent Association, April 2003
- Chair, Committee on Tenure for Dr. Duilio Ayalamacedo, 2004
- Invited guest, 11th Annual Chairmen’s Dinner Showcasing the Adrian Tinsley Program for Undergraduate Research, May 2004
- Chaired Department search committee for new Organic Chemistry position (S. Waratuke), 2004-05
- Contributor, “Community of Scholars” ad hoc committee, 2004-05
- Contributor, ad hoc committee, proposal for BSU Sustainability Center, 2004-05
- Contributor, ad hoc committee, proposal for a School of Science and Math, 2006-07
- Continuing Education Coordinator for Chemistry, 2006-present
- Member, Title III Grant Committee on Math Education and Readiness, 2007-08
- Member, School of Education Search Committee (science/math educator, secondary education), 2007-08 (search failed)
- Member, Faculty Development Leadership Group (FDLG), 2007-present

- Leadership mentor program, 2007-08
- Member, BSU American College and University Presidents Climate Commitment Task Force, 2007-present
- Member, Steering Committee for new Science/Math Building, 2008-present
- Member, Internship Faculty Working Group (Office of Career Services), 2009-present
- Member, OUR Director Search Committee, 2009-10
- Member, School of Science and Math Dean Search Committee, 2010
- Facilitator, Pedagogy Sustainability Theme, BSU Summer Institute for Faculty Development, August 23-27, 2010.