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EDUCATION

A.B. (Chemistry), Princeton University, 1960
Ph.D. (Chemical Engineering), University of Pennsylvania, 1964

WORK EXPERIENCE

Research Engineer, E. I. du Pont de Nemours & Company, Jackson Laboratory, Deepwater, NJ,
1964–1968
Assistant Professor of Chemical Engineering, University of Nebraska-Lincoln, 1968–1974
Associate Professor of Chemical Engineering, Iowa State University, 1974–1979
Professor of Chemical Engineering, Iowa State University, 1979–2005
Professor of Chemical and Biological Engineering, Iowa State University, 2005–present
Anson Marston Distinguished Professor in Engineering, Iowa State University, 1992–present

VISITING POSITIONS

NASA-ASEE Faculty Fellow, NASA-Ames Research Center, Moffett Field, CA, June 1972–
August 1972
Professeur invité, Institut de génie chimique, Ecole polytechnique fédérale de Lausanne,
Lausanne, Switzerland, July 1983–July 1984, August 1992–April 1993
Profesor Visitante, Departamento de Ingeniería Química, Instituto Tecnológico y de Estudios
Superiores de Monterrey, Monterrey, México, June 1988–July 1988
Visiting Scholar, Institut für landwirtschaftliche Technologie und Zuckerindustrie, Technische
Universität Braunschweig, Braunschweig, Germany, May 1989–July 1989, June 1993–July
1993
Visiting Scholar, Department of Chemical Engineering, University of Queensland, St. Lucia,
Queensland, Australia, June 1990–July 1990, June 1995–August 1995
Visiting Scholar, Institut für Bioverfahrenstechnik, Universität Stuttgart, Stuttgart, Germany,
May 1993–June 1993

HONORS AND AWARDS

H. A. Webber Award, Department of Chemical Engineering, Iowa State University, 1980
 Outstanding Teacher Award, College of Engineering, Iowa State University, 1982
 Outstanding Academic Advising Award, Student Alumni Association, Iowa State University, 1983
 Wilton Park International Service Award, Iowa State University, 1986
 Fellow, American Institute of Chemical Engineers, 1991
 Faculty Award, Phi Beta Delta Honor Society for International Scholars, Alpha Delta Chapter, 1994–95
 National Faculty Award, Phi Beta Delta Honor Society for International Scholars, 1995
 David R. Boylan Eminent Faculty Award in Research, College of Engineering, Iowa State University, 1996
 Archer Daniels Midland/Protein & Co-Products Division Award, American Oil Chemists' Society, 1997 (joint with coauthors S. L. Johansen, A. Sivasothy, M. K. Dowd, and E. G. Hammond)
 Phi Kappa Phi Centennial Medalist, 1997
 Faculty Citation, Iowa State University Alumni Association, 1997
 Irish Education 100 Award, 2011

TEACHING AND RESEARCH AREAS

Biochemical engineering, enzyme technology, computational biology, carbohydrate chromatography, utilization of agricultural residues

TECHNICAL PUBLICATIONS

- Humphrey, A. E. and P. J. Reilly. Kinetics of the Gluconic Acid Fermentation. *Biotechnol. Bioeng.*, **7**, 229 (1965).
- Chao, C.-C. and P. J. Reilly. Symbiotic Growth of *Acetobacter suboxydans* and *Saccharomyces carlsbergensis* in a Chemostat. *Biotechnol. Bioeng.*, **14**, 75 (1972).
- Kothari, I. R., G. C. Martin, P. J. Reilly, P. J. Martin, and J. M. Eakman. Estimation of Population Models for *Schizosaccharomyces pombe* from Chemostat Data. *Biotechnol. Bioeng.*, **14**, 915 (1972).
- Reilly, P. J., D. C. Timm, and J. M. Eakman. Nebraska's Integrated Process Development/Design Laboratory. *Chem. Engr. Ed.*, **8**, 116 (1974).
- Reilly, P. J. Stability of Commensalistic Systems. *Biotechnol. Bioeng.*, **16**, 1373 (1974).
- Shapira, J., C. L. Hanson, J. M. Lyding, and P. J. Reilly. Properties of Ribulose Diphosphate Carboxylase Immobilized on Porous Glass. *Biotechnol. Bioeng.*, **16**, 1507 (1974).
- Lee, D. D., Y. Y. Lee, P. J. Reilly, E. V. Collins, Jr., and G. T. Tsao. Pilot Plant Production of Glucose with Glucoamylase Immobilized to Porous Silica. *Biotechnol. Bioeng.*, **18**, 253 (1976).
- Fratzke, A. R. and P. J. Reilly. Utilization of Agricultural Wastes—The Enzymatic Hydrolysis of Matrix Polysaccharides. *Enzyme Technol. Digest*, **5**, 3 (1976).
- Chang, H. N. and P. J. Reilly. Optimal Catalyst Profiles for a Two-step Reaction Sequence in a Packed Bed. *Chem. Eng. Sci.*, **31**, 413 (1976).
- Chang, H. N. and P. J. Reilly. Immobilization and Characterization of Hog Kidney Mutarotase. *Biotechnol. Bioeng.*, **19**, 923 (1977).

- Fratzke, A. R. and P. J. Reilly. Uses and Metabolic Effects of Xylitol. Part 1. *Process Biochem.*, **12**(7), 27 (1977).
- Fratzke, A. R. and P. J. Reilly. Uses and Metabolic Effects of Xylitol. Part 2. *Process Biochem.*, **12**(10), 26 (1977).
- Chang, H. N. and P. J. Reilly. Experimental Operation of Multienzyme Systems in Optimal and Suboptimal Configurations. *Biotechnol. Bioeng.*, **20**, 243 (1978).
- Hon, C. C. and P. J. Reilly. Properties of β -Amylase Immobilized to Alkylamine Porous Silica. *Biotechnol. Bioeng.*, **21**, 505 (1979).
- Reilly, P. J. Optimization of Mono and Dual Enzyme Reactor Systems. *Ann. N. Y. Acad. Sci.*, **326**, 97 (1979).
- Reilly, P. J., in *Applied Biochemistry and Bioengineering*, Vol. 2, L. B. Wingard, Jr., E. Katchalski-Katzir, and L. Goldstein, eds. Academic Press, New York, 1979, pp. 185–207. Starch Hydrolysis with Soluble and Immobilized Glucoamylase.
- Lee, D. D., G. K. Lee, P. J. Reilly, and Y. Y. Lee. Effect of Pore Diffusion Limitation on Dextrin Hydrolysis by Immobilized Glucoamylase. *Biotechnol. Bioeng.*, **22**, 1 (1980).
- Kaboli, H. and P. J. Reilly. Immobilization and Characterization of *Leuconostoc mesenteroides* Dextranase. *Biotechnol. Bioeng.*, **22**, 1055 (1980).
- Oguntimein, G. B. and P. J. Reilly. Purification and Immobilization of *Aspergillus niger* β -Xylosidase. *Biotechnol. Bioeng.*, **22**, 1127 (1980).
- Oguntimein, G. B. and P. J. Reilly. Properties of Soluble and Immobilized *Aspergillus niger* β -Xylosidase. *Biotechnol. Bioeng.*, **22**, 1143 (1980).
- Bohnenkamp, C. G. and P. J. Reilly. Use of Immobilized Glucoamylase- β -Amylase and Glucoamylase-Fungal Amylase Mixtures to Produce High Maltose Syrups. *Biotechnol. Bioeng.*, **22**, 1753 (1980).
- Reilly, P. J., in *Immobilized Enzymes for Food Processing*, W. H. Pitcher, Jr., ed. CRC Press, Boca Raton, Fla., 1980, pp. 113–151. Potential and Use of Immobilized Carbohydrases.
- Lee, G. K., R. A. Lesch, and P. J. Reilly. Estimation of Intrinsic Kinetic Constants for Pore Diffusion-Limited Immobilized Enzyme Reactions. *Biotechnol. Bioeng.*, **23**, 487 (1981).
- Lee, G. K. and P. J. Reilly. The Effect of Slow Intraparticle Diffusion on Observed Immobilized Enzyme Stability. *Chem. Eng. Sci.*, **36**, 1967 (1981).
- Chang, H. N., Y. S. Ghim, Y. R. Cho, D. A. Landis, and P. J. Reilly. Immobilization of *Leuconostoc mesenteroides* Dextranase to Porous Phenoxycetyl Cellulose Beads. *Biotechnol. Bioeng.*, **23**, 2647 (1981).
- Reilly, P. J. and G. K. Lee. Effect of Slow Intraparticle Diffusion on pH-Stability Profiles of Immobilized Enzymes. *Chem. Eng. Commun.*, **12**, 195 (1981).
- Frederick, M. M., J. R. Frederick, A. R. Fratzke, and P. J. Reilly. Purification and Characterization of a Xylobiose- and Xylose-Producing Endo-Xylanase from *Aspergillus niger*. *Carbohydr. Res.*, **97**, 87 (1981).
- Reilly, P. J., in *Trends in the Biology of Fermentation for Fuels and Chemicals*, A. Hollaender, ed. Plenum Press, New York, 1981, pp. 111–129. Xylanases: Structure and Function.
- Ling, L.-H., E. M. Osman, J. B. Fernandes, and P. J. Reilly. Physical Properties of Starch from Cavendish Banana Fruit. *Starch/Stärke*, **34**, 184 (1982).
- Nikolov, Z. L. and P. J. Reilly. Isothermal Capillary Column Gas Chromatography of Trimethylsilyl Disaccharides. *J. Chromatogr.*, **254**, 157 (1983).
- Neryng, A. and P. J. Reilly. Laboratory Wet Milling of Ensiled Corn Kernels. *Cereal Chem.*, **61**, 8 (1984).

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- Frederick, M. M., C.-H. Kiang, J. R. Frederick, and P. J. Reilly. Purification and Characterization of Endo-Xylanases from *Aspergillus niger*. I. Two Isozymes Active on Xylan Backbones near Branch Points. *Biotechnol. Bioeng.*, **27**, 525 (1985).
- Shei, J. C., A. R. Fratzke, M. M. Frederick, J. R. Frederick, and P. J. Reilly. Purification and Characterization of Endo-Xylanases from *Aspergillus niger*. II. An Enzyme of pI 4.5. *Biotechnol. Bioeng.*, **27**, 533 (1985).
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- Sierks, M. R. and P. J. Reilly. Application of Crosslinked Carboxymethylcellulose Degradation by β -Glucosidase and Vaginal Microbes to Toxic Shock Syndrome. *Appl. Environ. Microbiol.*, **50**, 634 (1985).
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- Meagher, M. M., B. Y. Tao, J. M. Chow, and P. J. Reilly. Kinetics and Subsite Mapping of a D-Xylobiose- and D-Xylose-Producing *Aspergillus niger* Endo-(1,4)- β -D-Xylanase. *Carbohydr. Res.*, **173**, 273 (1988).
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- Dowd, M. K., P. J. Reilly, and W. S. Trahanovsky. Low Molecular Weight Organic Composition of Ethanol Stillage from Corn. *Cereal. Chem.*, **70**, 204 (1993).
- Dowd, M. K., P. J. Reilly, and A. D. French. Molecular Modeling of Two Disaccharides Containing Fructopyranose Linked to Glucopyranose. *J. Carbohydr. Chem.*, **12**, 449 (1993).
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- Chen, H.-M., U. Bakir, P. J. Reilly, and C. Ford. Increased Thermostability of Asn182→Ala Mutant *Aspergillus awamori* Glucoamylase. *Biotechnol. Bioeng.*, **43**, 101 (1994).
- Rapin, J.-D., I. W. Marison, U. von Stockar, and P. J. Reilly. Glycerol Production by Yeast Fermentation of Whey Permeate. *Enzyme Microb. Technol.*, **16**, 143 (1994).
- Coutinho, P. M., and P. J. Reilly. Structure-Function Relationships in the Catalytic and Starch-

- Binding Domains of Glucoamylase. *Protein Eng.*, **7**, 393 (1994).
- Dowd, M. K., S. L. Johansen, L. Cantarella, and P. J. Reilly. Low Molecular Weight Organic Composition of Ethanol Stillage from Sugar Cane Molasses, Citrus Waste, and Sweet Whey. *J. Agric. Food Chem.*, **42**, 283 (1994).
- Dowd, M. K., P. J. Reilly, and A. D. French. MM3(92) Relaxed-Residue Conformational Mapping of the Three Linkage Bonds of Isomaltose and Gentiobiose with MM3(92). *Biopolymers*, **34**, 625 (1994).
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- Coutinho, P. M., and P. J. Reilly. Structural Similarities in Glucoamylases by Hydrophobic Cluster Analysis. *Protein Eng.*, **7**, 749 (1994).
- Chen, H.-M., C. Ford, and P. J. Reilly. Substitution of Asn Residues in *Aspergillus awamori* Glucoamylase by Site-Directed Mutagenesis to Eliminate N-Glycosylation and Inactivation by Deamidation. *Biochem. J.*, **301**, 275 (1994).
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- Dowd, M. K., A. D. French, and P. J. Reilly. Modeling of Aldopyranosyl Ring Puckering with MM3(92). *Carbohydr. Res.*, **264**, 1 (1994).
- Henrissat, B., P. M. Coutinho, and P. J. Reilly. Reading-Frame Shift in *Saccharomyces* Glucoamylases Restores Catalytic Base, Extends Sequence and Improves Alignment with Other Glucoamylases. *Protein Eng.*, **7**, 1281 (1994).
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- Johansen, S. L., A. Sivasothy, M. K. Dowd, P. J. Reilly, and E. G. Hammond. Low Molecular Weight Organic Composition of Acid Waters from Vegetable Oil Soapstocks. *J. Am. Oil Chem. Soc.*, **73**, 1275 (1996).
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- Fang, T.-Y., P. M. Coutinho, P. J. Reilly, and C. Ford. Mutations to Alter *Aspergillus awamori* Glucoamylase Selectivity. I. Tyr48Phe49→Trp, Tyr116→Trp, Tyr175→Phe, Arg241→Lys, Ser411→Ala and Ser411→Gly. *Protein Eng.*, **11**, 119 (1998).
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- C. Ford*, Y. Lee, M. Allen, T. Fang, P. Coutinho, and P. Reilly. Mutagenesis of *Aspergillus awamori* Glucoamylase to Improve Thermal Stability and Substrate Specificity. Institute of Food Technologists Annual Meeting, Orlando, FL, 1997.
- C. Ford*, Y. Lee, M. Allen, T. Fang, P. Coutinho, and P. Reilly. Mutagenesis of *Aspergillus awamori* Glucoamylase to Improve Thermal Stability and Substrate Specificity. Fourteenth Engineering Foundation Conference on Enzyme Engineering, Beijing, China, 1997.
- **P. J. Reilly* and C. Ford. Glucoamylase Mutagenesis to Reduce Energy Use. Consortium for Plant Biotechnology Research Annual Meeting, Washington, DC, 1997.
- **A. Laederach, M. K. Dowd*, P. M. Coutinho, and P. J. Reilly*. Automated Docking of Malto-oligosaccharides in the Active Site of Soybean β -Amylase. 19th International Carbohydrate Symposium, San Diego, CA, 1998.
- P. J. Reilly. Working in the Tropics in Food Industry Opportunities. 18th Interamerican Congress of Chemical Engineering, San Juan, PR, 1998.
- P. J. Reilly. Iowa State University's Student–Faculty–Staff Exchange Program with the University of Glasgow. SUCCEED Coalition Best Practices Workshop on Outside Experiences, Clemson, SC, 1999.
- P. J. Reilly. Glucoamylase Mutagenesis to Reduce Energy Use. Consortium for Plant Biotechnology Research Annual Meeting, Washington, DC, 1999.
- P. J. Reilly. Identification and Quantitation of Low Molecular Weight Organic Components in Agricultural and Food Processing Wastes. Biotechnology Byproducts Consortium Spring 1999 Symposium, Des Moines, IA, 1999.
- H.-L. Liu, Y. Doleyres, P. M. Coutinho, C. Ford, and P. J. Reilly*. Mutations of Glucoamylase to Improve Its Selectivity and Thermostability. 217th ACS National Meeting, Anaheim, CA, 1999.
- A. Laederach, M. K. Dowd, P. M. Coutinho, and P. J. Reilly*. Automated Docking of Malto-oligosaccharides into the Active Site of Soybean β -Amylase. 217th ACS National Meeting,

- Anaheim, CA, 1999.
- P. J. Reilly. The Impact of Protein Engineering on Enzymatic Conversion of Starch. 50th Starch Convention, Detmold, Germany, 1999.
- P. J. Reilly. The Effects of Mutations on Starch-Degrading Enzymes. Frontiers in Carbohydrate Research 6, Purdue University, West Lafayette, IN, 1999.
- M. K. Dowd*, W. M. Rockey, A. D. French, and P. J. Reilly. Aldopentose Pyranosyl Ring Puckering with MM3. 20th International Carbohydrate Symposium, Hamburg, Germany, 2000.
- R. Larsen, A. Laederach, and P. J. Reilly*. Multisequence Alignment and Enzyme-Substrate Docking of Cellobiohydrolases I and II. AIChE Annual Meeting, Los Angeles, CA, 2000.
- P. J. Reilly. Exchange of Engineering Students across Cultural and Linguistic Boundaries. AIChE Annual Meeting, Los Angeles, CA, 2000.
- **A. Laederach* and P. J. Reilly. Modeling Carbohydrate-Protein Interactions Using Automated Docking. 221st ACS National Meeting, San Diego, CA, 2001.
- M. E. Meisch, A. Laederach, and P. J. Reilly*. Multiple Sequence Alignment, Phylogenetic Analysis, and Computational Structure Determination of Phospholipase D. 221st ACS National Meeting, San Diego, CA, 2001.
- D. Zhai and P. J. Reilly*. Effect of Fatty Acid Chain Length on Normal- and Reversed-Phase HPLC of Phospholipids. 92nd American Oil Chemists' Society Annual Meeting, Minneapolis, MN, 2001.
- **S. Berensmeier*, P. J. Reilly, and K. Buchholz. Isolation, Characterization and Inactivation Kinetics of Two Thermostable Amyloglucosidases. Enzyme Engineering XVI, Potsdam, Germany, 2001.
- P. M. Coutinho, M. K. Dowd, A. Laederach, W. M. Rockey, and P. J. Reilly*. Modeling of Carbohydrate-Protein Interactions Using Automated Docking. Sixth World Congress of Chemical Engineering, Melbourne, Australia, 2001.
- **A. D. Hill, R. T. Larsen, A. Laederach, and P. J. Reilly*. Cellobiohydrolase and β -Glucosidase Structure and Function. BioCycle Conference on Renewable Energy from Organics Recycling, Des Moines, IA, 2001.
- A. Laederach*, P. M. Coutinho, and P. J. Reilly. Flexible Docking of Carbohydrates to Proteins: Development of a Specific Linear Free Energy Model for AutoDock. 223rd ACS National Meeting, Orlando, FL, 2002.
- C. Mulakala and P. J. Reilly*. Understanding Protein Structure-Function Relationships in Family 47 α -1,2-Mannosidases through Computational Docking of Ligands. 224th ACS National Meeting, Boston, MA, 2002.
- C. Mulakala* and P. J. Reilly. Energy Landscape of Cellulose Binding in the *Trichoderma reesei* Cellobiohydrolase I. 224th ACS National Meeting, Boston, MA, 2002.
- P. J. Reilly. International Summer Programs. Global Academic Industrial Network Workshop, Mannheim, Germany, 2002.
- **P. J. Reilly* and C. Ford. Glucoamylase Mutagenesis to Increase Glucose Yield Reduce Energy Use. Consortium for Plant Biotechnology Research Annual Meeting, Washington, DC, 2003.
- **A. Aleshin, P.-H. Feng, R. B. Honzatko, and P. J. Reilly*. Crystal Structure and Evolution of a Prokaryotic Glucoamylase. Consortium for Plant Biotechnology Research Annual Meeting, Washington, DC, 2003.
- **C. L. Aikens*, A. Laederach, and P. J. Reilly. Automated Docking of Phospholipids into the Phospholipase D Active Site: Insight into the Catalytic Mechanism. 225th ACS National

- Meeting, New Orleans, LA, 2003.
- **A. Laederach* and P. J. Reilly. A General Method for Predicting the Bound Conformation and Free Energy of Formation of Protein/Carbohydrate Complexes. 225th ACS National Meeting, New Orleans, LA, 2003.
- P. J. Reilly. The Wonderful Cellulase Zoo. 115th Iowa Academy of Sciences Annual Meeting, Des Moines, IA, 2003.
- **C. Glatz*, K. Saunders, M. Huba, S. Mallapragada, B. Narasimhan, P. Reilly, and J. Shanks. PBL Approach to Bioprocessing Lab. NSF Grantees Conference, Washington, DC, 2003.
- C. L. Aikens, A. Laederach, and P. J. Reilly*. Automated Docking of Phospholipids into the Phospholipase D Active Site. AIChE Annual Meeting, San Francisco, CA, 2003.
- C. Mulakala* and P. J. Reilly. Computational Docking of Ligands into Family 7 Cellulases. AIChE Annual Meeting, San Francisco, CA, 2003.
- **R. S. Kuczenski, C. Mulakala, A. D. Hill, U. Gündüz, and P. J. Reilly*. Conversion of Cellulose to Glucose with Cellulases. Biobased Industry Outlook Conference, Ames, IA, 2004.
- A. Laederach* and P. J. Reilly. Specific Empirical Free Energy Function for Automated Docking of Carbohydrates to Proteins. 227th ACS National Meeting, Anaheim, CA, 2004.
- C. Mulakala* and P. J. Reilly. Force Calculations for Docked Ligands in Family 7 Cellulases. 227th ACS National Meeting, Anaheim, CA, 2004.
- B. Narasimhan, C. E. Glatz*, S. K. Mallapragada, P. J. Reilly, J. V. Shanks, K. Saunders, and M. Huba. Problem-Based Learning Laboratories On Chemicals from Biorenewables: Student Reflections. American Society for Engineering Education National Meeting, Salt Lake City, UT, 2004.
- P. J. Reilly. The Wonderful Enzyme Zoo. 18th Biennial Conference on Chemical Education, American Chemical Society, Ames, IA, 2004.
- C. L. Aikens, P. D. McMullen, A. Laederach, and P. J. Reilly*. Automated Docking of Substrates and Inhibitors into the Active Site of *Streptomyces* Phospholipase D. 12th International Biotechnology Symposium, Santiago, Chile, 2004.
- **C. Mulakala and P. J. Reilly*. Exploration of Family 1 Cellulose-Binding Domain Structure and Function by Automated Docking. 12th International Biotechnology Symposium, Santiago, Chile, 2004.
- **C. D. Warner* and P. J. Reilly*. Production, Purification, Crystallization, and Tertiary Structure Determination of Family 44 Endoglucanases. Biotechnology Byproducts Consortium Symposium, Iowa City, IA, 2004.
- P. J. Reilly*, C. E. Glatz, R. González, M. E. Huba, S. K. Mallapragada, B. Narasimhan, K. Saunders, and J. V. Shanks. Problem-Based Learning Biotechnology Courses in Chemical Engineering. Tenth Annual Meeting, Institute of Biological Engineering. Athens, GA, 2005.
- A. D. Hill* and P. J. Reilly. Computational Investigation of Specificities of Glycoside Hydrolase Family 1 Members. 229th ACS National Meeting, San Diego, CA, 2005.
- B. Mertz*, R. S. Kuczenski, R. T. Larsen, A. D. Hill, and P. J. Reilly. Family 6 Glycosyl Hydrolases: Automated Docking and Phylogenetic Analysis. 229th ACS National Meeting, San Diego, CA, 2005.
- P. Weschayanwivat, J. F. Scamehorn*, and P. J. Reilly. Surfactant Properties of Low Molecular Weight Phospholipids. 96th American Oil Chemists' Society Annual Meeting, Salt Lake City, UT, 2005.
- P. J. Reilly, Use of Automated Docking to Elucidate Hydrolase Structure and Function, Biocatalysis–2005, St. Petersburg, Russia, 2005.

- A. D. French*, G. P. Johnson, B. J. Lauterbach, and P. J. Reilly. Linkage Distortion Energies for Carbohydrates in Complexes with Crystalline Proteins: Basic Research for Future Innovations of Industrial Enzymes. 230th ACS National Meeting, Washington, DC, 2005.
- **C. D. Warner, T. C. Shilling, and P. J. Reilly*. Production, Purification, Crystallization, and Tertiary Structure Determination of Family 44 Endoglucanases. Biobased Industry Outlook Conference, Ames, IA, 2005.
- **C. Mulakala, W. Nerinckx, and P. J. Reilly*. Toward the Transition State: Further Docking Studies on Family 47 α -1,2-Mannosidases. AIChE Annual Meeting, Cincinnati, OH, 2005.
- Allen, M. J.*, A. Laederach, P. J. Reilly, R. J. Mason, and D. R. Voelker. Computational and Biochemical Analysis of Carbohydrate Recognition by Pulmonary Surfactant Protein D. 231st ACS National Meeting, Atlanta, GA, 2006.
- Mertz, B., A. D. Hill, C. Mulakala, and P. J. Reilly*. Automated Docking into Family 6 Cellobiohydrolase and Endoglucanase Active Sites. 231st ACS National Meeting, Atlanta, GA, 2006.
- Reilly, P. J. Using Computation to Determine Enzyme Active-Site Function. 22nd Interamerican Chemical Engineering Congress. Buenos Aires, Argentina. 2006.
- Reilly, P. J. The Wonderful Enzyme Zoo. 8th International Chemical Engineering Congress, Monterrey, México. 2007.
- **Petersen, L., W. Nerinckx, S. Fushinobu, and P. J. Reilly*. Active-Site Structure of Glycoside Hydrolase Family 48 Cellobiohydrolases/Processive Endoglucanases. 7th Carbohydrate Bioengineering Meeting, Braunschweig, Germany. 2007.
- **Fushinobu, S.*, B. Mertz, A. D. Hill, M. Hidaka, M. Kitaoka, T. Wakagi, H. Shoun, and P. J. Reilly. Computational Analyses on the Conformational Itinerary along the Reaction Pathway of GH94 Cellobiose Phosphorylase. 7th Carbohydrate Bioengineering Meeting, Braunschweig, Germany. 2007.
- **Fushinobu, S.*, M. Hidaka, M. Kitaoka, P. J. Reilly, T. Wakagi, and H. Shoun. Reaction Mechanism of Inverting Sugar Phosphorylases. 2nd International Symposium on Diffraction Structure Biology, Tokyo, Japan. 2007.
- Cantú, D., W. Nerinckx, and P. J. Reilly*. Automated Docking Shows That Asp463 Is the Catalytic Proton Donor in Human Endoplasmic Reticulum α -1,2-Mannosidase I. 235th ACS National Meeting, New Orleans, LA. 2008.
- Mertz, B.*, X. Gu, and P. J. Reilly. Analysis of Functional Divergence within Cellulase Families. 235th ACS National Meeting, New Orleans, LA. 2008.
- Warner, C. D.*, and P. J. Reilly. Tertiary Structure and Properties of a Glycoside Hydrolase Family 44 Endoglucanase from *Clostridium acetobutylicum*. AIChE Annual Meeting, Philadelphia, PA. 2008.
- Reilly, P. J. Computational Investigation of Cellulase and Xylanase Mechanisms. USDA National Research Initiative Project Directors Meeting. Genes to Products — Agricultural Plant, Microbe, and Biobased Product Research, Bethesda, MD. 2009.
- Petersen, L.*, and P. J. Reilly. Mechanism of Cellulose Hydrolysis by Inverting GH8 Endoglucanases: A QM/MM Metadynamics Study. 238th ACS National Meeting, Washington, DC. 2009.
- Petersen, L., A. Ardèvol, C. Rovira, and P. J. Reilly*. Quantum Mechanics/Molecular Mechanics to Probe the Mechanisms of Glycoside Hydrolases. Biotech METU 2009. Ankara, Turkey. 2009.

- **Elizondo-Noriega, A.*, Y. Chen, D. C. Cantu, and P. J. Reilly. Domain Organization of Acyl-CoA Carboxylases. AIChE Annual Meeting, Nashville, TN. 2009.
- Barker, I. J., L. Petersen, and P. J. Reilly*. QM/MM Metadynamics Simulation of Xylobiose Hydrolysis by *Geobacillus stearothermophilus* T-6 β -Xylosidase. 239th ACS National Meeting, San Francisco, CA. 2010.
- Warner, C. D., C. Ford, and P. J. Reilly*. Structure and Properties of a GH44 Xyloglucanase/Endoglucanase. 12th Bratislava Symposium on Saccharides, Smolenice Castle, Slovakia. 2011.
- Cantu, D. C.*, F. Jing, J. Tvaruzkova, J. P. Chipman, B. J. Nikolau, M. D. Yandea-Nelson, and P. J. Reilly. Phylogenetic and Experimental Characterization of an Acyl-ACP Thioesterase Family Reveals Significant Diversity in Enzymatic Specificity and Activity. AIChE Annual Meeting, Minneapolis, MN. 2011.
- Warner, C. D., C. Ford, and P. J. Reilly*. Kinetics and Modeling of Disproportionation Reactions Catalyzed by *Clostridium acetobutylicum* and *Ruminococcus flavefaciens* Endoglucanases. AIChE Annual Meeting, Minneapolis, MN. 2011.
- **Y. Chen, Y.*, D. C. Cantu, and P. J. Reilly. Classification of Ketoacyl Synthases by Their Primary and Tertiary Structures. AIChE Annual Meeting, Minneapolis, MN. 2011.
- Warner, C. D., C. Ford, and P. J. Reilly*. Structure and Properties of a GH44 Xyloglucanase/Endoglucanase. 25th Interamerican Chemical Engineering Congress. Santiago, Chile. 2011.
- **Cantu, D. C., Y. Chen, and P. J. Reilly*. Thioesterases: A New Perspective Based on Their Primary and Tertiary Structures. 25th Interamerican Chemical Engineering Congress. Santiago, Chile. 2011.

*Presenter.

**Poster.

INVITED LECTURES AND SEMINARS

- Department of Chemical Engineering, Kansas State University, February 1973.
- Department of Chemical Engineering, Texas Tech University, Lubbock, TX, March 1973.
- Department of Chemical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, April 1973.
- Department of Chemical Engineering, Drexel Institute of Technology, Philadelphia, PA, April 1973.
- Department of Chemical Engineering, Worcester Institute of Technology, Worcester, MA, April 1973.
- Dow Chemical Company, Midland, MI, August 1975.
- Hydron Laboratories, New Brunswick, NJ, December 1975.
- Quad-Cities Section, American Society of Agricultural Engineers, Rock Island, IL, April 1976.
- UOP, Inc., Des Plaines, IL, June 1976.
- Taiwan Sugar Research Institute, Tainan, Taiwan, February 1977.
- Sanraku-Ocean Co., Ltd., Fujisawa, Japan, February 1977.
- Korea Advanced Institute of Science, Seoul, Korea, August 1977.
- Federal Ministry of Science and Technology, Bad Neuenahr, Germany, September 1977.
- Phillips Petroleum Company, Bartlesville, OK, October 1977 (2 lectures).
- Department of Biochemistry, University of Lund, Lund, Sweden, December 1977.
- Novo Industri A/S, Bagsvaerd, Denmark, December 1977.

Procter & Gamble Company, Cincinnati, OH, February 1978.
 Department of Biochemistry, University of Nebraska Medical Center, Omaha, NE, May 1978.
 Celanese Corporation, Summit, NJ, June 1978.
 Department of Chemical and Biochemical Engineering, University of Pennsylvania, Philadelphia, PA, September 1978.
 Mississippi Valley Section, Society of Automotive Engineers, Rock Island, IL, October 1978.
 Department of Chemical Engineering, Louisiana State University, Baton Rouge, LA, November 1978.
 Hoffmann-La Roche, Inc., Nutley, NJ, March 1979.
 Catalysis Society of New York, Saddle Brook, NJ, March 1979.
 34th Distillers Feed Research Council Conference, Louisville, KY, March 1979.
 Korea Institute of Science and Technology, Seoul, Korea, December 1979.
 Korea Advanced Institute of Science, Seoul, Korea, December 1979.
 Wisconsin Section, Institute of Food Technologists, Manitowoc, WI, April 1981.
 Facultad de Ciencias Químicas y Farmacia, Universidad Nacional Autónoma de Honduras, Tegucigalpa, Honduras, July–August 1981 (7 lectures).
 Standard Fruit Company, La Ceiba, Honduras, August 1981.
 Consejo Nacional de Inversiones, Tegucigalpa, Honduras, August 1981.
 Facultad de Química, Universidad Nacional Autónoma de México, México, D.F., México, October 1981 (4 lectures).
 Faculty of Engineering Science, University of Western Ontario, London, Ontario, March 1982 (2 lectures).
 Bonneville Section, Institute of Food Technologists, Logan, UT, October 1982.
 Tate & Lyle Limited, Reading, England, August 1983.
 Department of Chemical Engineering, Michigan State University, East Lansing, MI, October 1983.
 Institut de génie chimique, Ecole polytechnique fédérale de Lausanne, Lausanne, Switzerland, November 1983 (2 lectures).
 Technische-Chemisches Laboratorium, Eidgenössische Technische Hochschule, Zürich, Switzerland, November 1983.
 Département de génie biochimique et alimentaire, Institut national des sciences appliquées, Toulouse, France, January 1984 (3 lectures).
 Institut für Biotechnologie, Kernforschungsanlage Jülich, Jülich, Germany, February 1984.
 Department of Chemical Technology, University of Bombay, Bombay, India, February 1984.
 Hindustan Antibiotics Ltd., Pune, India, March 1984.
 Biochemistry Division, National Chemical Laboratory, Pune, India, March 1984.
 Nestlé Products Technical Assistance Co. Ltd., La Tour-de-Peilz, Switzerland, March 1984.
 Laboratoire des sciences du génie chimique, Institut national polytechnique de Lorraine, Nancy, France, March 1984.
 Gesellschaft für Biotechnologische Forschung mbH, Braunschweig, Germany, April 1984.
 Carlsberg Laboratorium, Copenhagen, Denmark, April 1984.
 Novo Industri A/S, Bagsvaerd, Denmark, April 1984.
 Société Vaudoise des Sciences Naturelles, Lausanne, Switzerland, May 1984.
 Eidgenössische Anstalt für Wasserversorgung, Abwasserreinigung, and Gewässerschutz, Dübendorf, Switzerland, May 1984.
 Gist-Brocades NV, Delft, The Netherlands, May 1984.

Compañía Española de Petroleos, S.A., Torrejón, Spain, May 1984.
 Institut de génie chimique, Ecole polytechnique fédérale de Lausanne, Lausanne, Switzerland, June 1984.
 Miles Laboratories, Inc., Elkhart, IN, September 1984.
 Decatur-Springfield Local Section, American Chemical Society, Decatur, IL, October 1984.
 Chemical Engineering Program, University of Iowa, Iowa City, IA, October 1984.
 Technische Universität Hamburg–Harburg, Hamburg, Germany, September 1985.
 Département de génie biochimique et alimentaire, Institut national des sciences appliquées, Toulouse, France, October 1985.
 Carolina-Piedmont Local Section, American Chemical Society, Charlotte, NC, November 1985.
 South Carolina Local Section, American Chemical Society, Florence, SC, November 1985.
 Savannah River Local Section, American Chemical Society, Aiken, SC, November 1985.
 Coastal Empire Local Section, American Chemical Society, Savannah, GA, November 1985.
 International Paper Company, Tuxedo Park, NY, March 1986.
 UOP, Inc., Des Plaines, IL, May 1986.
 Carlsberg Laboratorium, Copenhagen, Denmark, June 1986.
 Technische-Chemisches Laboratorium, Eidgenössische Technische Hochschule, Zürich, Switzerland, July 1986.
 Institute of Chemistry, Slovak Academy of Sciences, Bratislava, Czechoslovakia, July 1986.
 St. Louis Local Section, American Institute of Chemical Engineers, St. Louis, MO, September 1987.
 Department of Chemical Engineering, Indian Institute of Technology, Kharagpur, India, January 1988 (2 lectures).
 Anil Starch Products Ltd., Ahmedabad, India, January 1988.
 Division of Biochemical Sciences, National Chemical Laboratory, Pune, India, January 1988.
 Enzyme Bio-Systems Ltd., Arlington Heights, IL, February 1988.
 Savannah River Local Section, American Institute of Chemical Engineers, Aiken, SC, April 1988.
 Palmetto Local Section, American Institute of Chemical Engineers, Columbia, SC, April 1988.
 Central Carolinas Local Section, American Institute of Chemical Engineers, Charlotte, NC, April 1988.
 Charleston Local Section, American Institute of Chemical Engineers, Charleston, WV, April 1988.
 Southern Regional Research Center, U. S. Department of Agriculture, New Orleans, LA, April 1988.
 Department of Chemistry, University of New Orleans, New Orleans, LA, April 1988.
 Southwest Louisiana Local Section, American Chemical Society, Lake Charles, LA, April 1988.
 Brazosport Local Section, American Chemical Society, Lake Jackson, TX, April 1988.
 Hoechst Celanese Corporation, Corpus Christi, TX, April 1988.
 South Texas Local Section, American Chemical Society, Corpus Christi, TX, April 1988.
 Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, México, July 1988.
 Novo Industri A/S, Bagsvaerd, Denmark, December 1988.
 Peoria Local Section, American Chemical Society, Peoria, IL, March 1989.
 Northern Regional Research Center, U.S. Department of Agriculture, Peoria, IL, March 1989.
 Joliet Local Section, American Chemical Society, Joliet, IL, March 1989.
 Rock River Local Section, American Chemical Society, Beloit, WI, March 1989.

Grain Processing Corporation, Muscatine, IA, March 1989.
 Illinois-Iowa Local Section, American Chemical Society, Muscatine, IA, March 1989.
 Iowa Local Section, American Chemical Society, Cedar Rapids, IA, March 1989.
 Nebraska Local Section, American Chemical Society, Lincoln, NE, March 1989.
 Institut de génie chimique, Ecole polytechnique fédérale de Lausanne, Lausanne, Switzerland, June 1989.
 Institut für landwirtschaftliche Technologie und Zuckerindustrie, Technische Universität Braunschweig, Braunschweig, Germany, June and July, 1989 (2 lectures).
 Gesellschaft für Biotechnologische Forschung mbH, Braunschweig, Germany, June 1989.
 Braunschweiger Produktionsgesellschaft mbH für Biotechnologie, Braunschweig, Germany, June 1989.
 Starcosa GmbH, Braunschweig, Germany, June 1989.
 Arbeitsbereich Biotechnologie, Technische Universität Hamburg-Harburg, Hamburg, Germany, June 1989.
 Miles Kali-Chemie GmbH & Co. KG, Hannover, Germany, June 1989.
 Novo Nordisk A/S, Bagsvaerd, Denmark, June 1989.
 Institut für Bioverfahrenstechnik, Universität Stuttgart, Stuttgart, Germany, July 1989.
 Genencor, Inc., South San Francisco, CA, November 1989.
 Universal Foods Corporation, Milwaukee, WI, May 1990.
 Department of Chemical Engineering, University of Queensland, Brisbane, Queensland, Australia, June and July 1990 (6 lectures).
 Departments of Biochemistry, Chemistry, and Food Science, University of Otago, Dunedin, New Zealand, July 1990 (2 lectures).
 Enzyme Bio-Systems Ltd., Arlington Heights, IL, August 1990.
 Department of Chemical Engineering, Korea Advanced Institute of Science & Technology, Daeduk Science Park and Seoul, Republic of Korea, September 1990 (2 lectures).
 Rocky Mountain Local Section, American Institute of Chemical Engineers, Lakewood, CO, February 1991.
 Idaho Local Section, American Institute of Chemical Engineers, Idaho Falls, ID, February 1991.
 Department of Chemical and Metallurgical Engineering, University of Nevada-Reno, Reno, NV, February 1991.
 Iowa Local Section, American Institute of Chemical Engineers, Amana, IA, May 1991.
 Department of Chemical Engineering, Ohio State University, Columbus, OH, May 1991.
 Unidad Profesional Interdisciplinaria de Ingeniería y Ciencias Sociales y Administrativa, Instituto Politécnico Nacional, México, D.F., México, November 1991 (fifteen-hour short course in Spanish).
 School of Chemical Engineering, Purdue University, West Lafayette, IN, November 1991.
 Institut National de la Recherche Agronomique, Nantes, France, January 1992.
 Departamento de Ingeniería Química, Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, México, March 1992.
 Wilmington Local Section, American Institute of Chemical Engineers, Wilmington, DE, March 1992.
 Central Carolinas Local Section, American Institute of Chemical Engineers, Charlotte, NC, March 1992.
 Institut de génie chimique, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, November 1992.

Société Vaudoise des Sciences Naturelles, Lausanne, Switzerland, December 1992.
 Technisch-Chemisches Laboratorium, Eidgenössische Technische Hochschule, Zürich, Switzerland, December 1992.
 Polybios, Trieste, Italy, March 1993.
 Institute of Chemistry, Slovak Academy of Sciences, Bratislava, Slovakia, April 1993.
 Institut für Bioverfahrenstechnik, Universität Stuttgart, Stuttgart, Germany, May and June 1993 (2 lectures).
 Institut für landwirtschaftliche Technologie und Zuckerindustrie, Technische Universität Braunschweig, Braunschweig, Germany, June and July, 1993 (5 lectures).
 Iowa Local Section, American Institute of Chemical Engineers, Amana, IA, October, 1993.
 Charleston Local Section, American Institute of Chemical Engineers, Charleston, WV, January 1994.
 Central Ohio Local Section, American Institute of Chemical Engineers, Columbus, OH, January 1994.
 Ohio Valley Local Section, American Institute of Chemical Engineers, Cincinnati, OH, January 1994.
 Central Illinois Local Section, American Institute of Chemical Engineers, Decatur, IL, January 1994.
 Wisconsin Local Section, American Institute of Chemical Engineers, Milwaukee, WI, January 1994.
 Texas Gulf Local Section, American Institute of Chemical Engineers, Freeport, TX, March 1994.
 East Texas Local Section, American Institute of Chemical Engineers, Longview, TX, March 1994.
 Procter and Gamble Company, Cincinnati, OH, April 1994.
 Genencor International, Inc., South San Francisco, CA, February 1995.
 Departments of Biochemistry, Chemistry, and Food Science, University of Otago, Dunedin, New Zealand, July 1995 (3 lectures).
 Departments of Chemical Engineering and Chemistry, University of Queensland, Brisbane, Queensland, Australia, July and August 1995 (3 lectures).
 Department of Chemistry, Queensland University of Technology, Brisbane, Queensland, Australia, August 1995.
 Coastal Empire Local Section, American Chemical Society, Savannah, GA, February 1996.
 Atlanta Local Section, American Institute of Chemical Engineers, Atlanta, GA, February 1996.
 Central Savannah River Local Section, American Institute of Chemical Engineers, Aiken, SC, February 1996.
 Jacksonville Local Section, American Chemical Society, Jacksonville, FL, February 1996.
 Tallahassee Local Section, American Chemical Society, Tallahassee, FL, February 1996.
 Southwest Georgia Local Section, American Chemical Society, Albany, GA, February 1996.
 Kraft Foods, Tarrytown, NY, March 1996.
 South Jersey Local Section, American Institute of Chemical Engineers, Cherry Hill, NJ, March 1996.
 Central New England Local Section, American Institute of Chemical Engineers, Windsor Locks, CT, March 1996.
 MoKanOk Local Section, American Chemical Society, Joplin, MO, March 1996.
 Wichita Local Section, American Chemical Society, and Kansas Association of College Chemistry Teachers, Dodge City, KS, March 1996.

Manhattan Local Section, American Chemical Society, Manhattan, KS, March 1996.
 Department of Chemical Engineering, Kansas State University, Manhattan, KS, March 1996.
 Department of Chemical and Petroleum Engineering, University of Kansas, Lawrence, KS, March 1996.
 Kansas City Local Section, American Chemical Society, Kansas City, MO, March 1996.
 Institute of Organic Chemistry, Biochemistry, and Biotechnology, Technical University of Wroclaw, Wroclaw, Poland, May 1996.
 Institut für Technologie der Kohlenhydrate an der Technischen Universität Braunschweig, Braunschweig, Germany, May 1996.
 Grain Processing Corporation, Muscatine, IA, July 1996.
 San Antonio Local Section, American Chemical Society, San Antonio, TX, September 1996.
 Greater Houston Local Section, American Chemical Society, Houston, TX, September 1996.
 Brazosport Local Section, American Chemical Society, Freeport, TX, September 1996.
 Texas Coastal Bend Local Section, American Chemical Society, Victoria, TX, September 1996.
 South Texas Local Section, American Chemical Society, Brownsville, TX, September 1996.
 Departamentos de Biotecnología y Química, Universidad Autónoma Metropolitana-Iztapalapa, México, D.F., México, January 1997.
 College of Engineering, University of Iowa, Iowa City, IA, February 1997.
 Ozark Local Section, American Chemical Society, Springfield, MO, February 1997.
 University of Missouri Local Section, American Chemical Society, Columbia, MO, February 1997.
 Mark Twain Local Section, American Chemical Society, Canton, MO, February 1997.
 Archer Daniels Midland Company, Decatur, IL, February 1997.
 Decatur-Springfield Local Section, American Chemical Society, Decatur, IL, February 1997.
 Southern Illinois Local Section, American Chemical Society, Cape Girardeau, MO, February 1997.
 Wyoming Local Section, American Chemical Society, Laramie, WY, March 1997.
 National Renewable Energy Laboratory, Golden, CO, March 1997.
 Colorado Local Section, American Chemical Society, Greeley, CO, March 1997.
 Salt Lake Local Section, American Chemical Society, Salt Lake City, UT, March 1997.
 Idaho Local Section, American Chemical Society, Idaho Falls, ID, March 1997.
 Agriculture Canada, Ste.-Hyacinthe, Québec, March 1997.
 Department of Food Science, McGill University, Ste. Anne de Bellevue, Québec, March 1997.
 Institute of Food Research, Norwich, England, May 1997.
 Department of Chemical Engineering, University of Colorado, Boulder, CO, September 1997.
 Department of Chemical and BioResource Engineering, Colorado State University, Fort Collins, CO, September 1997.
 Nebraska Local Section, American Chemical Society, Lincoln, NE, September 1997.
 Omaha Local Section, American Chemical Society, Omaha, NE, September 1997.
 Sioux Empire Local Section, American Chemical Society, Vermillion, SD, September 1997.
 Twin Cities Local Section, American Chemical Society, Minneapolis, MN, September 1997.
 Red River Valley Local Section, American Chemical Society, Bemidji, MN, September 1997.
 Mid-Michigan Local Section, American Institute of Chemical Engineers, Midland, MI, October 1997.
 Cargill Inc., Eddyville, IA, October 1997 (2 lectures).
 Genencor International, Inc., Palo Alto, CA, January 1998.

Grain Processing Corporation, Muscatine, IA, March 1998.
 Illinois-Iowa Local Section, American Chemical Society, Dubuque, IA, April 1998.
 Upper Peninsula Local Section, American Chemical Society, Marquette, MI, April 1998.
 Northeast Wisconsin Local Section, American Chemical Society, Green Bay, WI, April 1998.
 Central Wisconsin Local Section, American Chemical Society, Stevens Point, WI, April 1998.
 LaCrosse-Winona Local Section, American Chemical Society, Decorah, IA, April 1998.
 Lake Superior Local Section, American Chemical Society, Duluth, MN, April 1998.
 Nebraska Local Section, American Institute of Chemical Engineers, and Department of
 Chemical Engineering, University of Nebraska-Lincoln, Lincoln, NE, April 1998.
 Iowa BioDevelopment, Indian Hills Community College, Ottumwa, IA, November 1998.
 Genencor International, Inc., Palo Alto, CA, January 1999.
 Lehrstuhl für Technologie der Kohlenhydrate, Technische Universität Braunschweig, Braun-
 schweig, Germany, April 1999.
 Departments of Molecular Genetics & Cell Biology, University of Chicago, Chicago, IL, May
 1999.
 Laboratoire de l'Institut de Biologie structurale et Microbiologie, Centre National de la Re-
 cherche Scientifique, Marseille, France, May 1999.
 Toledo Local Section, American Chemical Society, Toledo, OH, March 2000.
 Central Soya Company, Fort Wayne, IN, March 2000.
 Wooster Local Section, American Chemical Society, Ashland, OH, March 2000.
 Ohio-Pennsylvania Border Local Section, American Chemical Society, Greenville, PA, March
 2000.
 Erie Local Section, American Chemical Local Section, Erie, PA, March 2000.
 Wisconsin Local Section, American Institute of Chemical Engineers, Madison, WI, March 2000.
 Department of Microbiology, Faculty of Pharmacy, Cairo University, Cairo, Egypt, May 2000 (5
 lectures).
 National Research Center, Cairo, Egypt, May 2000.
 Department of Chemical Engineering, Middle East Technical University, Ankara, Turkey, May
 2000 (2 lectures).
 Mid-Michigan Local Section, American Institute of Chemical Engineers, Midland, MI, October
 2000.
 East Central Illinois Local Section, American Chemical Society, Urbana, IL, March 2001.
 Peoria Local Section, American Chemical Society, Peoria, IL, March 2001.
 National Center for Agricultural Utilization Research, U.S. Department of Agriculture, Peoria,
 IL, March 2001.
 Illinois-Iowa Local Section, American Chemical Society, Davenport, IA, March 2001.
 Rock River and Joliet Local Sections, American Chemical Society, DeKalb, IL, March 2001.
 Centre for Biological and Chemical Engineering, Instituto Superior Técnico, Lisboa, Portugal,
 June 2001.
 Department of Textile Engineering, Universidade do Minho, Guimarães, Portugal, June 2001.
 Balcones Fault Local Section, American Institute of Chemical Engineers, Austin, TX, March
 2002.
 Maine Local Section, American Chemical Society, Portland, ME, November 2002.
 Green Mountain Local Section, American Chemical Society, Northfield, VT, November 2002.
 Northern New York Local Section, American Chemical Society, Potsdam, NY, November 2002.
 Lehrstuhl für Technologie der Kohlenhydrate, Technische Universität Braunschweig, Braun-

schweig, Germany, June 2003 (four lectures).

Durmishidze Institute of Biochemistry and Biotechnology, Georgian Academy of Sciences, Tbilisi, Republic of Georgia, June 2003 (two lectures).

Indiana-Kentucky Border Local Section, American Chemical Society, Evansville, IN, October 2003.

Southern Indiana Local Section, American Chemical Society, Bloomington, IN, October 2003.

St. Joseph Valley Local Section, American Chemical Society, South Bend, IN, October 2003.

Faith Baptist Bible College, Ankeny, IA, February 2004.

Departamento de Biología, Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, México, February 2004.

Red River Valley Local Section, American Chemical Society, Moorhead, MN, November 2004.

Department of Structural Biology and Biochemistry, Hospital for Sick Children, Toronto, Ontario, May 2005.

Durmishidze Institute of Biochemistry and Biotechnology, Georgian Academy of Sciences, Tbilisi, Republic of Georgia, June 2005 (two lectures).

Department of Chemical and Biomolecular Engineering, University of Nebraska-Lincoln, Lincoln, NE, September 2005.

Departamento de Biología, Universidad Autónoma Metropolitana-Iztapalapa, México City, D.F., México, November 2005.

Lehrstuhl für Technologie der Kohlenhydrate, Technische Universität Braunschweig, Braunschweig, Germany, April 2006 (two lectures).

Department of Chemical and Biological Engineering, South Dakota School of Mines and Technology, Rapid City, SD, April 2006.

Department of Chemical Engineering, New Jersey Institute of Technology, Newark, NJ, April 2007.

Departamento de Ingeniería Química, Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, México, June 2007 (twenty-hour short course).

Office of International Students and Faculty, New Jersey Institute of Technology, Newark, NJ, September 2007.

Orlando Local Section, American Chemical Society, Winter Park, FL, September 2007.

Florida Local Section, American Chemical Society, Lakeland, FL, September 2007.

Department of Physical Sciences, Barry University, Miami Shores, FL, September 2007.

South Florida Local Section, American Chemical Society, Davie, FL, September 2007.

Department of Biotechnology, University of Tokyo, Tokyo, Japan, May 2008.

Institut für Technische Chemie, Forschungszentrum Karlsruhe, Eggenstein-Leopoldshafen, Germany, June 2008.

Institut für Technische Chemie, Technische Universität Braunschweig, Braunschweig, Germany, June 2008.

Fakultät Biotechnologie, Hochschule Mannheim, Mannheim, Germany, June 2008 (seminar and six hours of coursework).

Illinois-Iowa Local Section, American Chemical Society, Davenport, IA, October 2008.

Iowa Local Section, American Chemical Society, North Liberty, IA, October 2008.

National Center for Agricultural Utilization Research, U.S. Department of Agriculture, Peoria, IL, October 2008.

Illinois Heartland Local Section, American Chemical Society, Peoria, IL, October 2008.

Wichita-Duncan Local Section, American Chemical Society, Lawton, OK, October 2008.

East Texas Local Section, American Chemical Society, Kilgore, TX, October 2008.
 Ouachita Valley Local Section, American Chemical Society, Grambling, LA, October 2008.
 Department of Chemical Engineering, University of Louisiana at Lafayette, Lafayette, LA,
 October 2008.
 Kansas City Local Section, American Institute of Chemical Engineers, Kansas City, MO,
 February 2010.
 Fakultät Biotechnologie, Hochschule Mannheim, Mannheim, Germany, June 2010 (seminar and
 six hours of coursework).
 Department of Chemistry, University of Wisconsin–Oshkosh, Oshkosh, WI, September 2010.

GRANTS AND SPONSORED PROGRAMS PARTICIPATION

Office of Water Resources Research, Department of Interior. A-020-NEB. July 1970 to June
 1972. Concurrent Growth of Algae and Bacteria in a Closed Vessel.
 National Science Foundation (Student-Originated Studies Program). GY-9111. March 1971 to
 June 1972. Preparation of Salable By-Products Through Aerobic Fermentation of Paunch
 Liquor.
 National Science Foundation (Student-Originated Studies Program). GY-10744. March 1973 to
 January 1974. Properties and Utilization of Small Particulates in Cattle Manure.
 National Science Foundation (Research Applied to National Needs Program). GI-34933. August
 1974 to June 1975. Simultaneous Application of Immobilized Glucoamylase and Glucose
 Isomerase for the Production of Sugar Mixtures from Starch.
 National Science Foundation (Research Applied to National Needs Program). GI-38101. August
 1974 to August 1976. Scaleup Study on Several Enzymic Processes for Industrial
 Application.
 National Science Foundation (Program on US/USSR Cooperation in Science and Technology).
 GI-44079. August 1974 to December 1976. Enzyme Technology in Utilization of Agricul-
 tural Wastes.
 National Science Foundation (Research Applied to National Needs Program). AER77-00198.
 March 1977 to December 1980. The Conversion of Agricultural By-Products to Sugars.
 World Food Institute, Iowa State University. September 1978 to June 1979. Starch from Waste
 Bananas.
 National Science Foundation (Division of International Programs). INT79-04532. May 1979 to
 October 1980. Immobilization and Characterization of Dextranase.
 National Science Foundation. PFR-8022895. March 1981 to August 1983. Kinetic and Specific-
 ity Patterns of Xylanases.
 National Science Foundation. CPE-8101102. October 1981 to March 1984. Kinetics of Gluco-
 amylase-Catalyzed Transfer Reactions.
 A. O. Smith Harvestore Co. January to July 1982. Milling of Ensiled Corn.
 Procter & Gamble Co. September 1982 to August 1983. Hydrolysis of Carboxymethylcellulose
 and CLD-2 Crosslinked Carboxymethylcellulose by Vaginal Enterobacteria.
 National Science Foundation. CPE-8311521. November 1983 to April 1986. Production of Di-
 and Trisaccharides from Glucose by Glucoamylase.
 Biotechnology Council, Iowa State University. July 1986 to June 1989. Mutagenesis of Gluco-
 amylase (PI, joint with Professor C. Ford and Dr. B. Svensson).
 Corn Refiners Association. September 1986 to August 1987. Graduate Student Support (joint

- with Professor J. F. Robyt).
- International Paper Company. December 1986 to June 1988. Use of *Chainia* Endo-Xylanases in Lignocellulosic Pulp Manufacture.
- National Science Foundation. CBT-8705128. July 1987 to December 1988. Engineering Research Equipment Grant: 15-Liter Fermentor and Associated Equipment (PI, joint with Professors C. E. Glatz, B. A. Glatz, E. G. Hammond, J. B. Peterson, R. Coolbaugh, R. E. Andrews, and P. A. Hartman).
- International Paper Company and Cultor Ltd. September 1987 to August 1989. Physical and Chemical Characterization of Endo-Xylanase from *Chainia* NCL-82-5-1.
- Roush Products Company, Inc. June 1988 to December 1988. Whitening of Vegetable Fibers.
- Center for Crops Utilization Research, Iowa State University. January 1989 to June 1991. Site-Directed Mutagenesis of Glucoamylase for Improved Selectivity, Operability, and Thermostability (PI, joint with Professor C. Ford).
- U. S. Department of Agriculture. April 1989 to August 2007. Biotechnology Byproducts Consortium (Professors R. Montgomery and R. C. Brown, Team Leaders).
- Midwest Plant Biotechnology Consortium and Novo Nordisk A/S. October 1989 to December 1991. Genetic Engineering of Glucoamylase for Improved Selectivity and Stability (PI, joint with Professor C. Ford and Dr. B. Svensson).
- Biotechnology Council, Iowa State University. October 1990 to October 1992. Three-Dimensional Structure of Glucoamylase (co-PI, joint with Professors R. B. Honzatko and C. Ford).
- Graduate College, Iowa State University. January 1991 to December 1991. Regiospecific Synthesis of Oligosaccharides in Organic-Rich Solvents (PI, joint with Professor Z. L. Nikolov).
- U. S. Department of Agriculture, National Research Initiative Competitive Grants. 92-37500-8204. October 1992 to September 1995. Protein Engineering of Glucoamylase (PI, joint with Professor C. Ford).
- Consortium for Plant Biotechnology Research, Inc. and Genencor International, Inc. January 1993 to June 1995. Protein Engineering of Glucoamylase (co-PI, joint with Professor C. Ford).
- Grain Processing Corporation. June 1993 to May 1996. Enzymatic Regiospecific Acylation of Monosaccharides and Maltooligosaccharides (PI, joint with Professor Z. L. Nikolov).
- Midwest Advanced Food Manufacturing Alliance and Genencor International, Inc. January 1996 to December 1996. Protein Engineering of Glucoamylase (co-PI, joint with Professor C. Ford).
- Kraft Foods, Inc. January 1996 to December 1996. Separation and Crystallization of Inulooligosaccharides (PI, joint with Professor M. A. Larson).
- Consortium for Plant Biotechnology Research, Inc. and Genencor International, Inc. July 1996 to June 1998. Glucoamylase Mutagenesis to Reduce Energy Use (PI, joint with Professor C. Ford).
- U. S. Department of Agriculture, National Research Initiative Competitive Grants. September 1996 to August 1998. Mutagenesis of Glucoamylase to Increase Its Catalytic Rate (co-PI, joint with Professor C. Ford).
- Consortium for Plant Biotechnology Research, Inc. and Genencor International, Inc. July 1998 to June 2000. Glucoamylase Mutagenesis to Increase Glucose Yield and Reduce Energy Use (PI, joint with Professor C. Ford).
- Feed Energy Co. July 1999 to June 2000. Removal of Fats and Oils from Vegetable Oil Acid Waters.

- U. S. Department of Agriculture, National Research Initiative Competitive Grants. September 1999 to August 2002. Directed Evolution of Glucoamylase to Increase Its Thermostability (co-PI, joint with Professor C. Ford).
- Carver Trust, Iowa State University. July 2000 to June 2001. Visualization and Understanding of Complex Amino Acid Structure-Function Relationships in Virtual Reality (PI, joint with Professor G. R. Luecke).
- Genencor International, Inc. and the Center for Advanced Technology Development, Iowa State University. December 2000 to December 2001. Computational Analysis and Mutagenesis of Cellulases (PI, joint with Professor C. Ford).
- National Science Foundation. BES-0313878. September 2003 to August 2006. Free Energy Estimation and Automated Docking of Carbohydrates to Proteins.
- Center for Catalysis, Iowa State University. May 2005 to May 2006. Hybrid Organic-Inorganic Catalyst for Cellobiose Hydrolysis (PIs P. J. Reilly, B. H. Shanks, and M. S. Hargrove).
- U.S. Department of Agriculture, National Research Initiative Competitive Grants Program. September 2007 to August 2010. Computational Investigation of Cellulase and Xylanase Mechanisms.
- National Science Foundation, Engineering Research Center Program. 2008 to 2013. Center for Biorenewable Chemicals (PI B. H. Shanks).

MASTER'S THESES DIRECTED

University of Nebraska-Lincoln

- S. K. Khinvasara. The cationic resin catalyzed esterification of choline in glacial acetic acid. 1970.
- C.-C. Chao. Symbiotic growth of *Acetobacter suboxydans* and *Saccharomyces carlsbergensis* in a chemostat. 1971.
- I. R. Kothari. Growth of single cells of *Schizosaccharomyces pombe* under nutrient limitation (jointly supervised with Prof. J. M. Eakman). 1971.
- S. Goto. Growth of the blue-green alga *Microcystis aeruginosa* under defined conditions. 1972.
- R. J. Williams. Sucrose hydrolysis by invertase immobilized in hollow fibers (jointly supervised with Prof. R. E. Gilbert). 1973.
- R. C. Eliason. Hydrolysis of sucrose by invertase covalently bound to the walls of hollow cellulose fibers (jointly supervised with Prof. R. E. Gilbert). 1975.

Iowa State University

- U. Gündüz. The properties of xylanase from *Aspergillus niger*. 1975.
- H. Kaboli. Properties of soluble and immobilized dextranase. 1978.
- R. Fournier A. The purification and characterization of an endo-xylanase from *Aspergillus niger*. 1979.
- Z. L. Nikolov. Glucoamylase-catalyzed production, chromatographic analysis, and anomeric properties of disaccharides. 1983.
- M. M. Meagher. Purification and chromatography of xylooligosaccharides and determination of kinetic parameters for an endo-xylanase. 1984.
- E. J.-M. Selosse. Gas chromatography of trisaccharides and kinetics of glucoamylase-catalyzed disaccharide hydrolysis. 1985.
- S. Pestlin. Condensation reactions catalyzed by *Aspergillus niger* glucoamylase: Kinetics, equil-

- ibria, and product analyses for two-monosaccharide systems. 1987.
- J. Zeng. Computation of conformations and energies of α -D-glucosyl disaccharides by molecular modeling. 1990.
- P. M. Coutinho. Computational studies of glucoamylase structure. 1993.
- N. M. Flory. Isolation and characterization of *Aspergillus awamori* glucoamylase mutants with altered thermostability (jointly supervised with Prof. C. Ford). 1993.
- S. L. Johansen. Low molecular weight organic composition of alkali-washed oilseed extracts from canola, corn, cottonseed, peanut, soybean, and sunflower (M.E. Creative Component). 1994.
- A. Sivasothy. Low molecular weight organic composition of acid waters from vegetable oil soap stocks. 1996.
- A. Joshi. Conformational analysis and molecular dynamics of mannosylated peptides. 1996.
- R. J. Fink-Winter. High performance liquid chromatography for separation of sugar phosphates and oligomers of immunoglobulin A (M.E. Creative Component). 1997.
- Z. Fan. Characterization of the thermostability and kinetics of *Acremonium strictum* glucooligosaccharide oxidase. 1999.
- P.-H. Feng. Production, purification, and characterization of a glucoamylase from *Thermoanaerobacterium thermosaccharolyticum*. 2001.
- D. Zhai. Effect of head group and fatty-acid chain length on normal- and reversed-phase HPLC of phospholipids. 2001.
- C. Mulakala. Understanding protein structure-function relationships in Family 47 α -1,2-mannosidases through computational docking of ligands. 2001.
- C. L. Aikens. Automated docking of phospholipids to the phospholipase D active site: Insight into the catalytic mechanism. 2003.
- T. C. Shilling. Cloning, expression, purification and characterization of a glycoside hydrolase family 44 cellulase from *Clostridium acetobutylicum* in *Escherichia coli*. 2007.

DOCTORAL DISSERTATIONS DIRECTED

Iowa State University

- D. D. Lee. Pilot plant production of glucose with glucoamylase immobilized to porous silica. 1978.
- G. K. Lee. The effect of slow substrate diffusion on the activity, stability, and selectivity of immobilized enzymes: A theoretical and experimental study. 1978.
- G. B. Oguntimein. Purification, characterization, and immobilization of β -xylosidase. 1979.
- A. R. Fratzke, Jr. Kinetic analysis of the dimerization and disproportionation of aqueous glyoxal. 1985.
- Z. Nikolov. Reversion reactions catalyzed by glucoamylases I and II from *Aspergillus niger*: Product analysis, kinetics, equilibria, and modeling. 1986.
- M. M. Meagher. Characterization, kinetics, and subsite mapping of *Aspergillus niger* glucoamylases I and II, and partial purification and characterization of a *Chainia* endo-xylanase. 1987.
- B. Y. Tao. Characterization of subsite binding and catalytic mechanisms of an endoxylanase, amylosucrase, and porcine pancreatic alpha-amylase (jointly supervised with Prof. J. F. Robyt). 1988.
- M. R. Sierks. Mutagenesis of the active site of glucoamylase from *Aspergillus awamori* (jointly supervised with Prof. C. Ford) (Research Excellence Award). 1988.

- U. Bakir. Tailoring the pH dependence of *Aspergillus awamori* glucoamylase by mutagenesis (jointly supervised with Prof. C. Ford). 1993.
- H.-M. Chen. Site-directed mutagenesis to enhance thermostability of *Aspergillus awamori* glucoamylase expressed in *Saccharomyces cerevisiae* (jointly supervised with Prof. C. Ford). 1993.
- P. M. Coutinho. Computational studies of glucoamylase selectivity (Research Excellence Award and Zaffarano Prize). 1996.
- H.-L. Liu. Mutational analysis of *Aspergillus awamori* glucoamylase selectivity to improve glucose yield (jointly supervised with Prof. C. Ford). 1998.
- A. Laederach. Protein-carbohydrate and protein-protein interactions: Using models to better understand and predict specific molecular recognition (Research Excellence Award and Zaffarano Prize) (jointly supervised with Prof. A. Andreotti). 2003.
- C. Mulakala. Force calculations in automated docking. 2005.
- A. D. Hill. Computational methods in the study of carbohydrates and carbohydrate-active enzymes. 2006.
- B. Mertz. Computational analysis of the phylogeny and thermodynamics of glycoside hydrolases. 2008.
- K. A. Vander Velden. Modeling biochemical networks (jointly supervised with Prof. V. G. Honavar). 2009.
- L. Petersen. Catalytic strategies of glycoside hydrolases. 2010.
- C. D. Warner. Structures, kinetics, and modeling of glycoside hydrolase family 44 endoglucanases from *Clostridium acetobutylicum* and *Ruminococcus flavefaciens* FD-1. 2010.

PROFESSIONAL ACTIVITIES

ISU Activities

- Departmental Curriculum Committee, 1974–75, 1980–83; Chairman, 1982–83; 1995–98
- World Food Conference Steering Committee, 1974–76
- Water Resources Advisory Committee, 1974–83
- College Research Advisory Committee, 1975–83; Chairman, 1980–83
- World Food Institute Faculty Policy Committee, 1978–83; Executive Committee, 1979–83
- Departmental Faculty Search Committee, 1978–79
- Departmental Foreign Study Program, 1979 (London), 1992 (London), 2001 (Oviedo)
- Departmental Graduate Admissions Committee, 1979–80
- Departmental Safety Committee, 1980–83; Chair 1980–82; 1993–2001; Chair, 1998–2001; 2006–2009; Chair 2006–2009
- Spanish for Faculty, 1980–83
- Study Abroad Programs Review Committee, 1981–83
- Council for International Programs, 1982–83
- Biotechnology Council, 1984–88, 1991–1994
- Iowa State University–University of Glasgow Exchange, Coordinator, 1984–2002
- Iowa State University–Universität/Technische Universität/Fachhochschule Hamburg Exchange, Temporary Coordinator, 1984–85
- Iowa State University–Université de Lausanne–Ecole Polytechnique Fédérale de Lausanne Exchange, Coordinator, 1985–present
- Advisory Committee for Iowa State University–University of Otago Exchange, 1985–1990

Iowa State University Chapter, Society of Hispanic Professional Engineers, Advisor, 1986–1992
 International Programs Coordinating Council, 1987–1989
 University Fermentation Facility, Professor-in-Charge, 1987–1990
 Engineering College Honors Program Committee, 1988–1991
 Departmental Review Committee, 1990
 Osborn Research Club, Chairman, 1991
 Study Abroad and Exchange Advisory Committee, 1993–2006
 College of Engineering International Programs Task Force, 1993–present
 Position paper on internationalization for 1995–2000 University Strategic Plan, 1994
 Departmental Chair Search Committee, 1997
 Departmental Faculty Search Committee, Chair, 1997–98
 College of Engineering Professional Development Committee, 1996–99; Chair, 1997–99
 Faculty Senate Professional Development Committee, 1997–99
 Departmental Undergraduate Recruitment and Minority Student Enhancement Committee, 1998–2006
 College of Engineering Honors and Awards Committee, 1999–2002, Chair, 2000–02
 Departmental Advising Coordinator, 2000–02
 College of Engineering Advising Committee, 2000–02
 Faculty Senate Honorary Degrees Committee, 2000–present, Chair, 2005–present
 College of Engineering Ad Hoc Distinguished Professor Panel to Consider Budget Cuts, 2001
 Faculty Senate Task Force on Teaching, 2002–03
 Faculty Review Board and Major Sanction Committee pool, 2002–present
 Search Committee for Dean of the College of Liberal Arts and Sciences, 2003–04
 College of Engineering Promotion and Tenure Committee, 2003–2009, Chair, 2004–2007
 Departmental Faculty Search Committee, 2003–04
 Distinguished Professor Review Committee, 2004–07
 Departmental Graduate Committee, 2005–2009
 University Library Committee, 2005–2007
 Faculty Senate Academic Affairs Council, 2005–06
 Departmental Honors and Awards Committee, 2005–present
 Iowa State University Chapter, Sigma Xi, President, 2006–07
 Library Advisory Committee, 2007–present, Chair, 2007–present
 Bioengineering Minor, College of Engineering, Chair of Supervisory Committee, 2008–present
 Departmental Curriculum Committee, 2009–present
 CBE-MSE Faculty Search Committee, Chair, 2010–2011

State, National, and International Activities

Charter Member (1968), Program Chairman (1970–71), Vice Chairman (1971–72), Chairman (1972–73), Nebraska Local Section, American Institute of Chemical Engineers
 Secretary-Treasurer (1974), Nebraska Section, American Chemical Society
 Career Guidance Chairman (1977–78), Treasurer (1979–80), Vice-Chairman (1986), Chairman (1987), Iowa Section, American Institute of Chemical Engineers
 Coordinating Committee between American Chemical Society and League for International Food Education (1974–77); Chairman (1975–77)
 Visited Ghana, Kenya, Zambia, Sri Lanka, and the Philippines on a mission sponsored by the U.S. Agency for International Development through the League for International Food

Education and the American Institute of Chemical Engineers to find locations for a pilot plant to demonstrate the conversion of agricultural byproducts to food or feed (January–February 1977)

Conducted follow-up visit to Sri Lanka for U.S. Agency for International Development, League for International Food Education, and the American Institute of Chemical Engineers to determine feasibility of proposed plant to produce tea leaf protein (June 1977)

National Science Foundation-Korea Science and Engineering Foundation Advisory Committee on Biochemical Engineering, Seoul, Korea (August 1977)

Session Co-Chairman, Sixth International Fermentation Symposium, London, Ontario (July 1980)

Participated in Title XII Strengthening Grant Program in Honduras (July–August 1981)

National Science Foundation Workshop on Prospects for Biotechnology, Charlottesville, VA (April 1982)

Session Co-chairman, Simposio Latinoamericano: Biotecnología para la Producción de Biomasa y Tratamiento de Desperdicios, Antigua Guatemala, Guatemala (February 1987)

Session Co-chairman, Ninth International Conference on Enzyme Engineering, Santa Barbara, CA (October 1987)

U.S. Department of Energy Workshop on Bioprocessing Research for Energy Applications, Alexandria, VA (November 1988)

Selection Committee, American Chemical Society Award in Separations Science and Technology (1989–91)

Member of Organizing Committee and Session Chairman, Midwest Biotechnology Symposium '89, '90, '91, '92, '93, St. Paul, MN (June 1989, May 1990, and June 1993), Madison, WI (May 1991), and Iowa City, IA (May 1992)

Session Co-chairman, 199th American Chemical Society National Meeting, Boston, MA (April 1990)

Curriculum Consultant, Asian Institute of Technology, Bangkok, Thailand (September 1992)

Session Moderator, Consortium for Plant Biotechnology Research Annual Meeting, Washington, DC (November 1996, November 1997, March 1999)

Advisory Board, *Starch/Stärke* (1999; 2011–present); Editorial Board (2000–2010)

Session Chair, Sixth World Congress of Chemical Engineering, Melbourne, Australia (September 2001)

Session Chair, Global Academic Industrial Workshop, Mannheim, Germany (October 2002)

Session Chair, 12th International Biotechnology Symposium, Santiago, Chile (October 2004)

Session Co-chair, Biocatalysis–2005, St. Petersburg, Russia (June 2005)

Session Chair, 239th American Chemical Society National Meeting, San Francisco, CA (March 2010)

Editorial Board, *Biotechnology Letters* (2011–present)

Revised 1/2/12