

(Revised June 2017)

CURRICULUM VITAE

GREGORY N. STEPHANOPOULOS

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ADDRESS: Massachusetts Institute of Technology
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BIRTH DATE

March 10, 1950

EDUCATION

Ph.D. University of Minnesota	1978	Chemical Engineering
M.S. University of Florida	1975	Chemical Engineering
B.S. National Technical University Athens, Greece	1973	Chemical Engineering

PROFESSIONAL EXPERIENCE

2006-	MIT, W.H. Dow Professor of Chemical Engineering and Biotechnology
2006-2007	ETH, Visiting Professor, Institute of Chemical and Bioengineering, Zurich
2000-05	MIT, Bayer Professor of Chem. Eng. and Biotechnology
2000-	MIT-Harvard Division of Health Science and Technology (HST), Professor
1990 - 1997	MIT, Associate Director, Biotechnology Center
1997 - present	Harvard University, MGH, Lecturer on Surgery and Bioengineering
1985 - 2000	MIT, Professor of Chemical Engineering
1983 - 1985	California Institute of Technology Associate Professor (tenured), Department of Chemical Engineering
1978 - 1983	California Institute of Technology Assistant Professor, Department of Chemical Engineering
1975 - 1978	University of Minnesota Research and Teaching Assistant, Department of Chemical Engineering
March-July, 1975	Union Carbide Corporation Linde Division, Tonawanda, New York Research and Development Engineer
1973-1975	University of Florida Research and Teaching Assistant, Department of Chemical Engineering

1972 Erbsloh Aluminum, Wuppertal, W. Germany, Summer Research Fellow
 1971 Italsider Steel, Naples, Italy, Summer Student Trainee

SPECIAL HONORS

2017 Novozymes Award for Excellence in Biochemical and Chemical Engineering
 2016 Eric and Sheila Samson \$1M Prime Minister's Prize for Innovation in Alternative Fuels for Transportation
 2016 Honorary degree from the National Technical University of Athens
 2015 Elected President of the American Institute of Chemical Engineers
 2014 William H. Walker Award of AIChE for Excellence in Contributions to Chemical Engineering Literature
 2013 American Academy of Microbiology, Elected Fellow
 2013 John Fritz Medal of the American Association of Engineering Societies (AAES)
 2012 Siegfried Prize from University of Zurich-ETH Zurich for outstanding accomplishments on process chemistry
 2012 Elected Fellow of the AIChE
 2011 Election as Corresponding Member of the Academy of Athens
 2011 Eni Prize in Renewable and non-Conventional Energy
 2011 Inaugural award from *Biotechnology Progress* for outstanding publications in biotechnology
 2010 George Washington Carver Award, BIO (Biotech Industry Organization)
 2010 ACS E.V. Murphree Award in Industrial and Engineering Chemistry
 2009 HBA-USA: Aristoteles Award for excellence in Biosciences research
 2009 Commonwealth of Massachusetts American-Hellenic Excellence Award
 2009 Amgen Award in Biochemical Engineering
 2007 AIChE Founders Award
 2007 Charles Thom Award, Society for Industrial Microbiology
 2006 Visiting Professor, ETH Zurich, D-CHAB department
 2005 Elected fellow of AAAS
 2005 *Doctor technices honoris causa*, Technical University of Denmark, DTU, Lyngby
 2003 Elected Member of the National Academy of Engineering (NAE)
 2002 Elected Director of the American Institute of Chemical Engineers
 2002 Merck Award in Metabolic Engineering
 2001 AIChE R.H. Wilhelm Award in Chemical Reaction Engineering
 2001 Marvin J. Johnson Award of the American Chemical Society
 2000 Ray W. Fahien Distinguished Alumni Award, Dept. of Chem. Eng., University of Florida
 1997: AIChE FPBE Division Award
 1993: Best Paper Award, Computers and Chemical Engineering
 1992: Founding Fellow, American Institute of Medical and Biological Engineering
 1992: Visiting Professor, Osaka University
 1992: AIChE FPBE Division Chairman
 1984: Presidential Young Investigator Award
 1984: Technical Achievement Award, South. California AIChE
 1982: Dreyfus Foundation Teacher Scholar Award
 1982: Excellence in Teaching Award, Caltech
 1973 "CHRISOVERGION" Award from the National Technical Univ. of Athens for the highest overall GPA in the ChE graduating class
 1973 Technical Chamber of Greece Award for the 2nd highest GPA in the University
 1968-73 National Scholarships Foundation Scholar throughout undergraduate studies
 1968 First Prize of the Greek Mathematical Society in a Panhellenic Competitive Math Exam

LECTURESHIPS

- 2017 Kroc Memorial Lecture, University of Chicago
 2016 Abbott Lectures, RPI
 2016 Henry A. McGee Lecture in Chemical and Life Science Engineering, Virginia Commonwealth University
 2015 Beiyang Lecture, Tianjin University, China
 2014 Alkiviades C. Payatakes Memorial Lecture, FORTH Institute, Patra, Greece, December, 15, 2014.
 2014 Lacey Lectures, Caltech, Chemical Engineering
 2014 LuoJia Lecture, Wuhan University
 2014 University of Western Ontario Distinguished Lecture
 2013 Giulio Natta Inaugural Lectureship, Milano Polytechnico
 2013 Mason Lectures, Stanford University
 2012 University of Massachusetts Alumni Lectures
 2012 KAIST Global Distinguished Lecturer
 2012 **Chancellor's Distinguished Lecture, Louisiana State University**
 2011 Paul C. Wilber Distinguished Lecture, Rice University
 2010 Pigford Distinguished Lecture, University of Delaware
 2009 McFerrin Distinguished Lecturer, Texas A&M University
 2009 Ashland Distinguished Lecturer, University of Kentucky
 2009 Distinguished Lectureship, Imperial College, London, UK
 2009 Robb Lectureship, Pennsylvania State University
 2008 Inaugural Founders Lectureship, First Ken Nobe Lecture, UCLA
 2008 Academy Lectures, University of Missouri-Rolla
 2007 Lowrie Lectures, Ohio State University
 2005 Amundson Lectures, University of Guadalajara
 2005 McCabe Lectureship, North Carolina State University
 2004 Lumpkin Lecture, U. Maryland Baltimore County
 2004 Ralph Peck Annual Memorial Lecture, Illinois Institute of Technology
 2004 Cary Lectures, Georgia Institute of Technology
 2004 Holtz Lectures, Johns Hopkins University
 2004 Centennial Lecture, Clarkson University
 2003 Kelly Lectures, Purdue University, 2003
 2003 Distinguished Lecturer, University of Utah
 2003 Patten Distinguished Lecture, University of Colorado
 2003 Joe and Essie Smith Distinguished Lectureship, U.C. Davis
 2002 A.G. Fredrickson Lecture, University of Minnesota
 2002 Merck Distinguished Lectureship, Rutgers University
 2002 Distinguished Lecturer, University of Virginia
 1996 Inaugural Bayer Lectureship, UC Berkeley
 1991 Merck Lecturer U.P.R.
 1987 Marchon Lectureship, Newcastle University

PROFESSIONAL AFFILIATIONS

American Institute of Chemical Engineers
 American Chemical Society, MBT Division
 Society for Industrial Microbiology
 American Society for Microbiology
 American Institute of Medical and Biological Engineering
 American Association for the Advancement of Science (AAAS)

TEACHING

- ChE 103b Transport Phenomena; Heat Transfer (Caltech) (Winter 1979, 1980, 1981, 1982, 1983, 1984, 1985)
- ChE 103c Transport Phenomena: Mass Transfer and Unit Operations (Caltech) (Spring 1979, 1980, 1981)
- ChE 163 Biochemical Engineering Fundamentals, jointly with Professor J. E. Bailey (Caltech) (Winter 1981, Fall 1982, Winter 1983, 1984, 1985)
- ChE 101 Chemical Kinetics and Reactor Design (Caltech) (Spring 1981, 1982, 1983, 1984, 1985)
- 10.565 Separations of Biological Products: Electrokinetic Separations, (MIT) Chromatography, (Fall 1985)
- 10.302 Transport Phenomena (MIT) (Spring 1986, 87, 88, 89, 90, 91, 92)
- 10.57 Modeling of Biological Systems (MIT) (Spring 1986, 87)
- 10.989 Special Topics in Biotechnology (MIT) (1987, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 00, 01, 02, 03)
- 10.26, 10.27 Chemical Engineering Laboratory (MIT) (1993, 94, 95, 96, 97, 98, 99, 00, 01)
- 10.546 Metabolic Engineering (MIT) (1993, 94, 95, 96)
- 10.544 Metabolic and Cell Engineering (MIT) (1997, 98, 99)
- 10.491 Integrated Chemical Engineering, Module on Biochemical Engineering (MIT) (1994, 95, 96, 97, 98, 99)
- 10.555 Bioinformatics (with Dr. I. Rigoutsos) (2000, 01, 02, 03)
- 10.541-SMA 5413 Kinetics of Chemical and Biological Systems (graduate level, with B. Trout and J.Y. Lee) (2001, 02, 03)
- 10.37 Kinetics of Chemical and Biological Systems (undergraduate level, with C.L. Cooney) (2003.)

SUPERVISION OF RESEARCH

Theses Supervised (in parenthesis: present position)

Ken Eagle, (SUNY Buffalo)	M.S., May 1980, "Growth of Pure and Mixed Microbial Cultures."
Don Rogers	M.S., June 1982, "A Catalyst/Absorbent for a Regenerable Flue Gas Desulfurization Process" (joint supervision with Professor G.R. Gavalas).
Dorian Liepmann, (Caltech)	M.S., May 1983, "A Closed Ecosystem Model: Development and Global Sensitivity Analysis" (UC Berkeley).
Ka Yiu San, (Rice U)	Ph.D., January 1984, "Studies of On-Line State Estimation of Bio-Chemical Reactors."
Julia Kornfield, (Caltech)	M.S., September 1984, "Development of Asymmetric Composite Materials for Enhanced Oxygen Transfer and Product Separation in Fermentation Systems." (Caltech).
Alberto Dalla Torre, (U. Padova)	M.S., September 1984, "A Mixed-Culture Model of Anaerobic Digestion. Applications to Optimal Start-Up and Digester Control." (U. Padova).
Brian Davison, (U. Rochester)	Ph.D., June 1985, "Dynamics and Coexistence of mixed Microbial Cultures." (Oak Ridge National Lab.)

- Nam Sun Wang, (UC Berkeley) Ph.D., June 1986, "Experimental and Theoretical Studies of the Effect of Delays in Biological Systems." (U. Maryland).
- Gary Lapidus, (U. Mass) M.S., May 1985, "The Dynamic of Plasmid Bearing-Plasmid Free Mixed Recombinant Cultures."
- Ron Grosz Ph.D., June 1987, "Biochemical and Mathematical Modeling of Micro-aerobic Continuous Ethanol Production by *Saccharomyces Cerevisiae*." (DuPont, Gillette).
- Betty J.M. Hannoun Ph.D., June 1988, "Intrinsic Reaction Rates and Mathematical Modelling of Immobilized Cells of *Saccharomyces Cerevisiae*." (Merck & Co.)
- K. Tsiveriotis, (NTU Athens) M.S., June, 1988, "Convection Inside a Porous Microbial Particle as a Means of Nutrient Transport."
- M. Mavrovouniotis, (NTU Athens) Ph.D., December 1988, "Artificial Intelligence Methods in the Design and Evaluation of Biochemical Pathways." (Northwestern University).
- Max Kennedy, (New Zealand) Ph.D., June 1990, "The Monitoring and Evaluation of a Solid Substrate Submerged Culture Fermentation." (New Zealand Development Agency).
- Joe Vallino, (UC Berkeley) Ph.D., November 1990, "Identification of Branch-Point Restrictions in Microbial Metabolism through Metabolic Flux Analysis and Local Network Perturbations." (Brown University, Department of Ecology and Evolutionary Biology)
- Robert Kiss, (UC Davis) Ph.D., August 1991, "Metabolic Activity Control of the L-Lysine Fermentation by Restrained Growth Fed Batch Strategies." (Genentech).
- Mark Applegate Ph.D., November 1991, "Development and Characterization of Macroporous Ceramic Matrix Bioreactors for Mammalian Cell Culture." (Advanced Tissue Sciences).
- Gino Grampp, (U. Wisconsin) Ph.D., June 1992, "Controlled Protein Secretion in Animal Cell Culture." (Amgen).
- Craig Zupke, (Caltech) Ph.D., April 1993, "Metabolic Flux Analysis in Mammalian Cell Culture." (Immunex).
- David Stevenson, (SW Texas) MS, December 1993, "Regulated Secretion in Mammalian Cells."
- Rahul Singhvi, (IIT Delhi) Ph.D., February 1994, "Control of Cell Behavior by Engineering Substrata with Defined Surface Topography and Chemistry." (Merck Vaccine Production).
- John Chung, (UC Sta. Barbara) Ph.D., February 1994, "Single Cell Gene Expression in *Bacillus subtilis*. An investigation into the Molecular Basis of Culture Heterogeneity." (Axy's Pharmaceuticals).
- Grace Colón, (U. Penn) Ph.D., May 1995, "Metabolic Engineering of Amino Acid Production in *Corynebacterium glutamicum*". (President, Industrial Products Division and Senior Vice President, Intrexon Corporation).
- Sung Park, (Caltech) Ph.D., January 1996, "Metabolic Engineering in *Corynebacterium glutamicum* for Lysine Synthesis." (Samsung, leader biofuels development).
- Roy Kamimura, (UC Berkeley) Ph.D., **May 1997, "Application of Multivariate Statistics to Fermentation Database Mining." (Lawrence Livermore Labs.)**
- Cathryn Shaw-Reid, (Caltech) Ph.D., **May 1997, "Branchpoint Flux Analysis in the L-Lysine Pathway of *C. glutamicum*." (Merck Research Labs.)**
- Michael Marsh, (CMU) MS, **December 1997, "Analysis of Fermentation Spectroscopic Data Using Multivariate Statistics and Pattern Recognition." (PPG Industries).**
- Robert Balancel Ph.D., July 1999, "Effects of Rapamycin and Insulin on the Cell Cycle and Apoptosis of Hybridoma Cell Cultures." (BD Technologies, San Jose).
- Kurt Yanagimachi, (U. Washington) Ph.D., July 2000, "Analysis of the Indene Bioconversion Network in *Rhodococcus* species." (Bristol Myers).
- Mattheos Koffas, (NTU Athens) Ph.D., October 2000, "Metabolic Engineering of Aminoacid Production in *Corynebacterium glutamicum*." (SUNY, Buffalo).
- Ameya Agge, (IIT Bombay) M.S., December 2000. (McKinsey Management Consulting).

- Maria Klapa, (Nat'l Tech U. Athens) Ph.D., August 2001, "High Resolution Flux Determination Using Stable Isotopes and Mass Spectrometry." (University of Maryland).
- Pat Walton, (Georgia Tech.) Ph.D., October 2001, "Thermodynamics and kinetics of antisense oligonucleotide hybridization." (Michigan State University).
- Kyongbun Lee, Stanford U.) Ph.D., November 2001, "Metabolic engineering analysis of post-burn hepatic hyper-metabolism." (Tufts University).
- Dan Stafford, (U. Michigan) Ph.D., December 2001, "Systems analysis and metabolic engineering of biocatalytic reaction networks: Application to indene bioconversion." (University of Michigan).
- Bill Schmitt, (Michigan State U.) Ph.D., July 2003, "Extracting transcriptional regulatory information from DNA microarray expression data." (Putnam Investments).
- Vipin Gupta (IIT Delhi) Ph.D., November 2003, "Extracting regulatory signals from DNA sequences using syntactic pattern discovery," (Sloan MBA program).
- Daehee Hwang Ph.D., November 2003, "A statistical framework for the extraction of structured knowledge from biological/biotechnological systems," (Post-doc at Institute for Systems Biology; Faculty member at Postech).
- Javier Femenia, (UC Berkeley) Ph.D., December 2003, "Analysis of signal transduction networking using activation ratios." (Biomarin, Inc.)
- Jatin Misra, (IIT Delhi) Ph.D. February 2004, "Quantitative methods for linking transcriptional profiles to physiology."
- Saliya Silva, (Oxford U.) M.S. June 2004, "Transcriptional profiling and flux measurements of polyhydroxybutyrate production in *Synechocystis*." (Pyramid Lanka, Sri Lanka).
- Hyun-Tae Yoo (Seoul Nat'l U.) Ph.D. December 2004, "Quantitative analysis of carbon fluxes for fat biosynthesis in wild-type and IRS-1 knockout brown adipocytes," (U.Texas at Dallas, Dept. of Biology and Biowengineering, Ass't Professor).
- Chris Roberge (MIT) Ph.D. March 2005, "Design, manufacture and application of DNA microarrays to study gene expression phenotypes of lysine-producing *Corynebacterium glutamicum*," (Energy Biosciences Institute, Berkeley, CA)
- Manish Bajaj (IIT Bombay) Ph.D. April 2005, "DNA hybridization: Fundamental studies and applications in directed assembly." (McKinsey Consulting).
- Mike Raab (U. Wisconsin) Ph.D. November 2005, "Genomic analysis of hepatic insulin resistance," (Agrivida, Founder, President and CEO).
- Matthew Wong (Rice U.) Ph.D. February 2006, "Integrated characterization of cellular physiology underlying hepatic metabolism," (Glycos Biotechnologies, Houston).
- Hal Alper (U. Maryland) Ph.D. April 2006, "Development of systematic and combinatorial approaches for the metabolic engineering of microorganisms," (U. Texas Austin, Ass't Professor).
- Kyle Jensen (U. Illinois) Ph.D. May 2006, "Motif discovery in sequential data," (UV Berkeley, post-doc.).
- Peter Heinzelman (U. of Wisc'n) Ph.D. May 2006, "Identification of HIV protease mutants with improved specificities toward an alzheimer's disease associated peptide sequence," (Oklahoma State University, Ass't Professor).
- Maciek Antoniewicz (Delft Univ.) Ph.D. May 2006, "Comprehensive analysis of metabolic pathways through the combined use of multiple isotopic tracers." (U. of Delaware, Assistant Professor)
- Joel Moxley (Princeton U.) Ph.D. February 2007, "Linking genetic regulation and metabolic state."
- Chris Loose (Princeton U.) Ph.D. April 2007, "The production, design and application of antimicrobial peptides," (Semprus Biosciences, Founder and CTO).
- Mark Styczynski (Notre Dame U.) Ph.D. May 2007, "Application of motif discovery in biological data," (Georgia Institute of Technology, Assistant Professor).
- Jin Kiat Ng (Nat'l U. Singapore) Ph.D. July 2007, "Design, development and application of a spatially addressable protein microarray," (Singapore Polytechnic)

Jose O. Aleman (Cornell U.)	Ph.D. January 2008 , “ Gluconeogenesis as a system: Development of <i>in vivo</i> flux analysis of hepatic glucose production in type 2 diabetes, ” (Resident, Rockefeller University, NYC).
Lily Tong (Georgia Tech)	Ph.D. August 2008 , “ Development and application of Mass-Spectrometry-based metabolomics methods for disease biomarker identification, ” (McKinsey Consulting).
Keith Tyo (West Virginia U.)	Ph.D. August 2008 , “ Forward and inverse metabolic engineering strategies for improving polyhydroxybutyrate production, ” (Northwestern University).
Yew Chung Tang, (NUS)	Ph.D. January 2009 , “ An information theory-based approach for studying cellular signaling networks, ” (Duke University Medical Program)
Curt Fischer (Notre Dame)	Ph.D. May 2009 , “ Selection and optimization of gene targets for the metabolic engineering of <i>E. coli</i>, ” (Ginkho Bioworks)
Daniel Klein (UT Austin)	Ph.D. May 2009 , “ Phenotypic diversity as a tool to guide and optimize random strain improvement approaches, ” (UC Berkeley, post-doc)
Benjamin Wang (Carnegie Mellon)	Ph.D. May 2009 , “ High throughput screen for cells with high extracellular metabolite consumption/secretion rates using microfluidic droplets, ” (Merrimack Pharmaceuticals).
Jason Walther (Stanford)	Ph.D. April 2010 , “ Non-stationary Metabolic Flux Analysis (NMFA) for the elucidation of cellular physiology, ” (Genzyme, Corp.)
Christine Santos (Stanford)	Ph.D. May 2010 , “ Combinatorial search strategies for the metabolic engineering of microorganisms, ” (BioArchitecture, Inc.)
Tanguy Chau (UC Berkeley)	Ph.D. August 2010 , “ Analysis and design of antimicrobial peptides, ” (MIT Sloan School)
Hang Zhou (Tsinghua University)	Ph.D. January 2011 , “ Metabolic Engineering of Yeast for Xylose Uptake and Fermentation, ” (Genzyme Corporation)
Deepak Dugar (IIT Delhi)	Ph.D. December 2011 , “ Pathways for synthesis of advanced biofuels, ” (MIT Sloan School)
Mitchell Tai (Carnegie Mellon U.)	Ph.D. July 2012 , “ Metabolic Engineering of oleaginous yeast for biofuels production, ” (Bristol Myers Squibb, Seattle)
Vikram Yadav (U. of Waterloo)	Ph.D. June 2013 , “ Biosynthetic Engineering for the assembly of better drugs, ” (Assistant Professor at the U. of British Columbia)
Paulo Gameiro (U. Coimbra)	Ph.D. June 2014 , “ On the Reprogramming of the Krebs Cycle in Hypoxic and VHL-Deficient Cancer Cells, ” (Postdoc, Harvard Med. School, UC London, UK)
Sagar Chakraborty (IIT Kharagpur)	Ph.D. November 2014 , “ Exploring volatile fatty acids (VFAs) as novel substrate for fatty acid production, ” (Kraft, Heinz).
Andrew Silverman (U. of Florida)	Ph.D. September 2015 , “ Metabolic engineering strategies for increasing lipid production in oleaginous yeasts, ” (Conagen)
Tom Wasylenko (Princeton)	Ph.D. May 2015 , “ ¹³C-Metabolic flux analysis of recombinant yeasts for biofuels applications, ” (Genzyme-Sanofi Corp.)
Steve Edgar (Georgia Tech)	Ph.D., December 2016 , “ Metabolic engineering for the production of functionalized terpenoids in heterologous hosts, ” (Zymergen Corp.)
Ben Woolston (Penn State U.)	Ph.D., May 2017 , “ Enabling C1-based bioconversion with Metabolic Engineering ”

Theses in Progress

Mark Keibler (University of Maryland) “An integrated approach to understanding the metabolic rewiring of cancer cells”

Dave Emerson (Penn State University)
 Zhe Zhang (Tsinghua University)
 Alkis Chatzivasileiou (NT U of Athens)
 Boon Uranukul (Johns Hopkins University)
 Nian (Steven) Liu (U. California, Berkeley)
 Wentao Dong (U. Wisconsin, Madison)
 Sun-Jin Moon (Korea University)

Current postdocs

Valerie Ward (U. Western Ontario, Canada)
 Felix Lam (UC San Francisco)
 Brian Perreira (RPI)
 Devin CURRIE (Dartmouth College)
 Ahsan Islam (U. of Toronto)
 Jason King (Duke University)
 Zbignew Lazar (Wroclaw University, Poland)

Past Postdoctoral Students (in parenthesis: present position)

Hugo Guterman (Ben Gurion University, Professor)
 Athanassios Sambanis (Georgia Tech, Professor)
 Seujung Park (Bristol Myers)
 Alberto Dalla Torre (U. Madova)
 Thomas Chattaway (Amylum, France)
 Urs Saner (Harvard Business School)
 Georg Locher
 K. Chen (Novo Nordisk, China)
 Martin Reinecke
 W. G. Lee (Seoul National University)
 John Chung (Axys Pharmaceuticals)
 Savvas Anastassiadis (University of Thrace, Greece, Professor)
 Hiroshi Shimizu (Osaka University, Dept. of Bioinformatics, Japan, Professor)
 Ulrich Schulze (Boston Consulting Group)
 Silvio Bicciato (University of Modena, Professor)
 Anna Sanfeliu
 Mario Jolicoeur (Ecole Polytechnique, Montreal, Professor)
 Javier Francisco (Autonomous University of Barcelona, Professor)
 Aristos Aristidou (Cargill, Inc.)
 Roopa Ramamoorthi (San Jose State University)
 Stelios Kouvroukoglou (Procter & Gable, Rome)
 Sushil Rijwani (Bristol Myers Squibb, PRTM Management Consulting)
 Stefan Wildt (Glycofi, Merck)
 Gaspar Taroncher (*Nature Biotech*, Senior Editor)
 Ryan Gill (University of Colorado, Associate Professor))
 Juan Carlos Aon (Glaxo SmithKline)
 Ilias Alevizos (University of Padova)
 Angelo Mondragon (Consultant)
 Gary Jung (Postech University, Korea, Associate Professor)
 Yong-su Jin (U. of Illinois, Dept. of Food Science and Human Nutrition, Associate Professor)

Yongchao Zhang (Home Diagnostics, Ft. Lauderdale, Florida)
 Elke Nevoigt (Professor, Jacobs University, Bremen, Germany)
 Tina Lutke, (Manager, Rentschler Biotechnologie GmbH, Munich)
 Michael Hansen (Denmark Technical University, Researcher)
 Jamey Young (Vanderbilt University, Assistant Professor)
 Franz Hartner (Lonza Co., Switzerland)
 Christie Peebles (Colorado State University, Assistant Professor)
Karsten Hiller (University of Luxemburg, Ass't Professor)
 Christian Metallo (University of California San Diego, Assistant Professor)
 Hussain Abidi (Novogy, Inc., VP Lipids research)
 Karsligil Orhan
 Marjan DeMey (U. of Ghent, Belgium, Assistant Professor)
 P. Ajikumar (CTO, Manus Biosciences, Cambridge, MA)
 Ryan Lim (Manus Biosciences, Cambridge, MA)
 Hamid Rismani (Novozymes, Inc.)
 Huimin Yu, PhD, (2007-08, Tsinghua University, Associate Professor)
 S.-M. Fendt (Vesalius research Center, Leuven, Belgium)
 Jie Zhang (Novo Nordisk Foundation Center, DTU)
 Hongjuan LIU (2013-14, Associate Professor, Tsinghua University)
 Hui LUO (2011, Beijing University of Science and Technology)
 Shi An WANG (Chinese Academy of Sciences, Qungdao)
 Jianbin YAN (Tsinghua University, Associate Professor)
 Huilei YU (2013-14, East China U. of Science and Technology, Associate Professor)
 Zhengjun LI (2014-15, Beijing University of Chemical Technology, Associate Professor)
 Jose Avalos (Princeton University, Assistant Professor)
 Haoran Zhang (Rutgers University, Assistant Professor)
 Peng Hu (CEO, GTL Biofuels, Shanghai, China)
Kang ZHOU (Nat'l U. of Singapore, Assistant Professor)
 Yuting Zheng (Agiros Pharmaceuticals)
 Woo-suk AHN (Genzyme, Sanofi)
 Niju Narayanan (U. Waterloo, Canada)
 Turenli Burcu (Bursa Tecknic University, Turkey)
 Kangjian Qian (Sanofi Genzyme)
 Amit Kumar (MIT, postdoc)
 Peng XU (Assistant Professor, U. Maryland, Baltimore County)

Foreign students (in parenthesis: Home Institution at time of MIT visit)

Oliver Mucha, (BS, student from TU Berlin, 2007)
 Simon Carlsen (PhD student, Technical University of Denmark, 2007-10)
 Felipe Vargas (PhD student, Catholic University of Chile, 2008-09)
 Wen-Hai Xiao (PhD student, presently Associate Professor, Tianjin University)
 Paulo Gameiro (PhD student, Coimbra University, 2009-2012)
 Xiaobin Huang (PhD student, Tsinghua University, 2009-2010)
 Takashi Yamamoto (PhD Student, Tokyo Tech, 2010-2011)
 Sawada Kazunori, Hokaido University (PhD, 2013, then Mitsubishi Chemicals Co.)
 Jean Marc Biesler (MS, EPFL, 2012)
 Andre Gaeta Bernardi (MS, University of Sao Paulo, Brazil, 2013)

Moritz Wolf (MS, ETH, Zurich, 2014)
 Michael Reiter (MS, U. of Munich, 2014-15)
 Claude Hoeltgen (MS, ETH, Zurich, 2015)

Industrial visitors, sabbatical visitors (in parenthesis: present position)

Eduardo Agosin, PhD, (1988, Catholic University of Chile, Professor)
 Joanne Kelleher, PhD (Senior Scientist, Massachusetts General Hospital, 2001-)
 Kohei Miyaoku, (2003-04, Mitsubishi Chemicals)
 Marianthi Ierapetritou, PhD, (2005-06, Rutgers University, Associate Professor)
 Yasushi Noguchi, PhD, (Ajinomoto Co., Japan, 2007-08)
 Keisuke Shibuya (Hitachi Corp., October 2009-March 2010)
 Karin Heldt (2011, Michigan Tech, Assistant Professor)
 Fengwu BAI (Dalian U. of Technology, 2010)
 Kouichi Kuroda (Kyoto University, 2014-15)

EDITORIAL BOARDS

Current

- Metabolic Engineering, co-Editor, 1997-2002; Editor-in-Chief 2003-
- Current Opinion in Biotechnology, co-Editor in Chief, 2010-
- Technology, 2013-
- Current Opinion in Chemical Engineering, 2012-
- Pharmaceutical Bioprocessing, 2012-
- Biomedical Engineering Research, 2012-
- WIRE Systems Biology and Medicine, 2011-
- Sustainable Energy Development, book series, 2011-
- Molecular and Microbiological Reviews, MMBR, 2011-
- Biofuels, 2009-
- Engineering in Medicine and Biology series, Artech House Publishers, 2005-
- Trends in Biotechnology, 2003 -
- Biosystems Review, 2005-
- GCB Bioenergy, 2014-
- Bioresources and Bioprocessing, 2015-

Past

- Advances in Biochemical Engineering/Biotechnology, 1999 – 2015
- Global Change Biology-Bioenergy, 2008-2013
- Annual Review of Chemical and Biomolecular Engineering, 2008-2012
- Journal of Biotechnology, 2000-2010
- Bioprocess and Biosystems Engineering, 2000-2005
- Applied Microbiology & Biotechnology, 2004-2009
- Mathematical Biosciences, 1984 - 1998
- Biotechnology Progress, 1984 – 2002
- J. of Industrial Microbiology and Biotechnology, 1996 - 2011

- **Ulman's Encyclopedia of Industrial Chemistry, 1995 - 2005**

ADVISORY AND OTHER BOARDS

Current

- NAE, Section 2 Peer Committee, 2016-
- Swiss National Science Foundation Board on National Center for Competence in Research (NCCR) program (2015-
- ISCRE Board of Directors, (2011-)
- Institute for Genomic Biology, University of Illinois, External Advisory Board (2012-)
- AIChE Journal Board of Consulting Editors, 2012-
- Process Technology Institute, TU Delft, 2012-
- Scientific Advisory Board, Institute for Systems Biology, Seattle, 2011-
- University of South Carolina, Research Advisory Board, 2004-

Past

- Purdue University, Department of Chemical Engineering Academic Advisory Board, 2006-2013
- Energy Biosciences Institute (EBI) Advisory Board, 2009-2012
- University of Florida, Dept. of Chemical Engineering Advisory Board, 2003-2005
- Manchester Interdisciplinary Biocentre (MIB), Scientific Advisory Panel, 2005-2009
- Pennsylvania State University, College of Engineering Industrial and Professional Advisory Council, 2002-05
- University of Virginia, Dept. of Chemical Engineering, 2003 –2006
- Johns Hopkins University, Dept. of Chemical Engineering, 2003–2005

CONFERENCE CHAIRMANSHIPS

- 2003: Gordon Conference on Bioinformatics
 1996: Chair, Metabolic Engineering Conference
 1992: ICCAFT 5 / IFAC-BIO 2 International Conference Chairman
 2011: 1st International Conference on Electrofuels, Providence, RI

COMMITTEE SERVICE

Caltech

- Graduate Admissions Committee, Departmental, 1978 - 85
Chairman, 1983, 84
- Divisional Computing Committee, 1983 - 85
- Division Chairman Search Committee 1984
- Institute Curriculum Committee 1984 - 85

MIT (Departmental)

- Graduate Admissions Committee Chairman, 1988 - 1992
- Departmental Committee on Research Space, 1986 - 1987
- Interdepartmental Biotechnology Committee, 1988 - 1991
- Biotechnology Process Engineering Center, Operating and Executive Committee, 1985-97
- ChE Faculty Search Committee 1992 -
- Ad Hoc Committee on ChE Graduate Degrees, 1995 - 97
- Committee on 2-key appointments, 2000
- Faculty Search Committee, 2005-

MIT (Institute)

- Engineering Education Committee, 1992-93
- Faculty-Administration Committee, 2000-2002; Chair 2002-03
- Sea Grant College Program, 2005-2008

Professional and Other Organizations

- AIChE Programming Coordinator, Area 15c (Biotechnology), FPB Division, 1982-87
- AIChE Task Force on Programming, 1988
- AIChE FPBE Division Executive Committee, 1989 - 94, Chair 1992
- NIH Study Section on Biotechnology Training Grants, 1989 - 91
- NSF Review Panel on Biotechnology, 1988 - 89
- AIMBE Annual Conference Co-Chair (1994); Board of Directors (1994 - 96) and Vice President for Policy (1994 - 96)
- NIH Workshop on Metabolic Engineering, 1995
- ONR Workshop on Gene Networks and Cellular Controls, 1996
- NSF Interagency Workshop on Metabolic Engineering, 1996
- NSF, Career Grant Panel, 2000
- Member, International Faculty, Technical University of Denmark, 2001-04
- **NSF Workshop: "Future Directions of Biochemical Engineering," November 2001**
- Review Panel-*Systems Biology*, Federal Ministry of Education & Research, Germany, 11/28-30,'05
- AIChE Board of Directors (2002-05)
- Society for Biological Engineering, Management Board (2003-); Chair (2009-2014)
- NRC Panel on Alternative Fuels (2007-08)
- AIChE Foundation Board Member (2009-)
- NRC-NAS Panel on Algae as source of biofuels (2011-12)
- AAAS-Elected member of the Electorate Nominating Committee for Engineering, (2012-2015)
- AIChE President Elect, President and Past President and member of the Board of Directors (2015-2017).

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424. B.M. Woolston, D. Emerson and G. Stephanopoulos, "Evaluation of biosynthetic pathways for conversion of natural gas to liquid fuels," (submitted) (2015).
425. Shawn M. Davidson, T. Papagiannakopoulos, B.A. Olenchock, A. Luengo, J.E. Heyman, M.A. Keibler, M.R. Bauer, J.P. O'Brien, K.A. Pierce, D.Y. Gui, T.M. Wasylenko, B.T. Mott, Gregory Stephanopoulos, T.E. Jacks, C.B. Clish, and M.G. Vander Heiden, "Oxidative glucose metabolism is essential for Ras-driven non-small cell lung cancer," (submitted) (2015).
426. Woo suk Ahn, Zhe Zhang, J. Cantor, D.M. Sabatini, O. Iliopoulos and G. Stephanopoulos, "Glyceraldehyde 3-phosphate dehydrogenase modulates non-oxidative pentose phosphate pathway to provide anabolic precursors in hypoxic tumor cells," (submitted) (2015).
427. S. Basu, M. Keibler, P. Jarolim, S. Lovitch, and G. Stephanopoulos, "13C Metabolic Pathway Analysis on Enriched Leukemic Cells: A Novel Ex Vivo Platform to Monitor Cancer Metabolism," (submitted) (2016).
428. Xixian Chen, C. Zhang, R. Zou, G. Stephanopoulos and Heng-Phon Too, "Cell-free metabolic engineering of amorpha-4,11-1 diene biosynthesis at enhanced rate and specific yield of production," (submitted) (2016).
429. J. Yang, F. Cheng, H. Yu and G. Stephanopoulos, "Role of carbonyl terminus of hyaluronan synthase in hyaluronic acid synthesis and size control," (submitted) (2016).
430. Jingyang Xu, Nian Liu, K.J. Qiao, S. Vogg and G. Stephanopoulos, "Application of metabolic controls for maximization of lipid production in oleaginous yeast," (submitted) (2017).
431. B.M. Woolston, T. Roth, I. Kohale, D. Liu and G. Stephanopoulos, "Development of a formaldehyde biosensor with application to synthetic methylotrophy," (submitted) (2017).
432. J. Marlow, A. Kumar, B. Enalls, C. Stetson, L. Reynard, J. Delaney, P. Girguis and G. Stephanopoulos, "Harnessing a mixed microbial community in support of a methane-fueled, sediment-free system for utilization of distributed sources of natural gas," (submitted) (2017).

433. Zheng-Jun Li, K.J. Qiao, Xue-Mei Che and G. Stephanopoulos, "**Metabolic engineering of *E. coli* for the synthesis of the quadriopolymer Poly(glycolate-co-lactate-co-3-hydroxybutyrate-co-4-hydroxybutyrate) from glucose,**" (submitted) (2017).

INTERNATIONAL CONFERENCE CHAIRMANSHIPS

1. "Kinetics and Thermodynamics in Biological Systems," IEC Winter Symposium, co-chair with H. Blanch and T. Papoutsakis (1982).
2. International Conference on Mathematical Modeling in fermentation Technology, ICCAFT Series, Keystone, CO (1992).
3. Gordon Research Conference on Bioinformatics, co-chair with I. Rigoutsos, Queens College, Oxford, UK, (2003).
4. First International Conference on Metabolic Engineering, Danvers, MA, (1996).
5. First International Conference on Electrofuels, organized by the Society for Biological Engineering, Providence, RI, (2011)

TECHNICAL MEETING SESSION CHAIRMANSHIPS

1. "Advances in Mathematical Modeling and State Estimation of Biochemical Reactors," 182nd Annual ACS Meeting, New York, August 1982 (co-chair with A. Moreira).
2. "Kinetics and Thermodynamics in Biological Systems," IEC Winter Symposium 1982, co-chair with H. Blanch and T. Papoutsakis.
3. "Process Modeling, Dynamics and Control," session of the 2nd Engineering Foundation Conference on Biochemical Engineering. Miramar Hotel, Santa Barbara, September 19-24, 1982.
4. "Antibiotic Fermentations," Annual AIChE Meeting, San Francisco, November, 1984.
5. "Cell Recycle Fermentations," Annual ACS Meeting, Chicago, September, 1985.
6. "Immobilized Cell Systems," Annual AIChE Meeting, Chicago, November, 1985.
7. "Biosensors and Reactor State Estimation," Biochemical Engineering V, Engineering Foundation Conference, Henniker, New Hampshire (1986).
8. "Bioprocessing Strategies: Integration, Control, and Artificial Intelligence," Annual AIChE Meeting, Miami (1986).
9. "Science and Engineering of Mammalian Cell Cultures," 2 sessions, Annual AIChE Meeting, New York City (1987).
10. "Bioprocess Optimization and Control," Biochemical Engineering VI, Engineering Foundation Conference, Santa Barbara, CA (1988).
11. "Pathway Analysis and Metabolic Engineering," Annual AIChE Meeting, San Francisco (1989).
12. "Progress in Metabolic Engineering and Production of Biochemicals," ACS Meeting, New York City, (1991).
13. "Protein Synthesis and Processing in Eucaryotic Cell Systems," Annual AIChE Meeting, Los Angeles, Nov. 17-22, (1991).
14. "Control of Bioprocesses," 9th Int. Biotech. Symposium, Crystal City, Washington D.C., August 16-21 (1992).
15. Third Annual AIMBE Meeting, (co-chair with M. Yarmush), Washington, D.C., March 6-8 (1994).
16. "Cell Culture Monitoring and Control," Cell Culture Engineering Conf. IV, San Diego, CA, March 7-12, 1994.
17. "Redirection of Primary Metabolism," Engin. Foundation Conference on rDNA Biotechnology III, Deauville, France, October 16-20, 1994.

18. "Cell Physiology", Engin. Foundation Conf. on Biochemical Eng'n IX, Davos, Switzerland, May 21-26, 1995.
19. **"Advances in Metabolic Engineering,"** 7th International Conference on Computer Applications in Biotechnology, Osaka, May 31-June 4, 1998.
20. "Metabolic Engineering and Bioinformatics," Metabolic Engineering-III, Colorado Springs, CO, October 22-27, 2000
21. "Metabolic Engineering," Colloquium of the 101st General meeting of the American Society for Microbiology, Orlando, May 20-24, 2001.
22. **"Deduction of Biological Networks,"** Gordon Research Conference: Bioinformatics: From inference to predictive models, Tilton, NH, August 19-24, 2001.
23. Gordon Research Conference on Bioinformatics, co-chair, Queens College, Oxford, UK, (2003).
24. **"Reconciling private sector needs with academic research and curriculum in biotechnology,"** Session at First World Congress on industrial biotechnology and bioprocessing, Orlando Florida, April 21, 2004.
25. **"Impact of genomics upon metabolic engineering,"** ASM Conference on Integrating Metabolism and Genomics (IMAGE), Montreal, April 30-May 3, 2004.
26. **"Biological and Biochemical Reaction Engineering,"** 18th Int'l Symposium on Chemical reaction Engineering, ISCRE-18, Chicago, June 6-9, 2004.
27. **"What does metabolic modeling contribute to microbiology?"** 106th ASM General Meeting, Orlando, May 21-25, 2006.
28. **"Biomass to biofuels conversion: technical and policy perspectives,"** 2008 AAAS Annual Meeting, Boston, MA, 14-18 February, 2008.
29. **"Medical and Pharmaceutical Biotechnology,"** 14th International Biotechnology Symposium, Rimini, Italy, September 14, 2010
30. **"Renewable sources of energy,"** panel at the MIT Energy Conference, Boston, March 5, 2011.
31. **"Synthetic biology and networks,"** in Gordon Research Conference on Plant Metabolic Engineering, Waterville Valey, July 2011.

PRESENTATIONS

1. Invited Presentations at Major Conferences
 1. "Measurements, Data Rectification, and Estimation Algorithms for the continuous Monitoring of Biochemical Reactors," presented at the 1st IFAC Workshop on Modelling and Control of Biotechnical Processes, Helsinki, Finland, August 1982.
 2. "Application of Estimation and Filtering Theories to Fermentation Processes," American Control Conference, San Diego, CA, June, 1984.
 3. "The Use of Macroscopic Balances and Bioenergetics of Growth for the On-Line Identification of Fermentation Processes," Engineering Foundation Conference, Biochemical Engineering IV, Galway, Ireland, 1984.
 4. "A New Approach to Bioprocess Modelling and Identification," 6th Symposium on Biotechnology for Fuels and Chemicals," Gatlinburg, TN, May 15-18, 1984.
 5. "Algorithmic Sensors," NBS Workshop on "Sensors in Biotechnology," Gaithersburg, MD, May 30, 1985.
 6. "Control Strategies for Biological Processes," Keynote Address, Biotechnical '85, International Congress and Exhibition, Hannover, W. Germany, October 8-10, 1985.
 7. "Intelligent Sensors in Biotechnology: Applications to the Monitoring of Fermentations and Cellular Metabolism," Engineering Foundation Conference, Biochemical Engineering V, Henniker, NH, 1986.
 8. "Controlled Protein Secretion in Mammalian Cells," ASEE Annual Conference, Reno, June 1987.

9. "Intelligent Sensors for Monitoring of Cellular Metabolism," Frontiers in Bioprocessing Conference, Boulder, CO, June 1987.
10. "Problems and Opportunities in Bioreactor Control," Keynote Address, 4th Med. congress in Chemical Engineering, Barcelona, Nov. 10-13, 1987.
11. "Controlled Protein Secretion. A Model System," Cell Culture Conf., Engineering Foundation Conference, Palm Coast, Florida, 1988.
12. "Toward a Systematic Method for the Generalization of Fermentation Data," Keynote Address, IV Intl. Conf. Computer Appl. to Fermentation Technology, Cambridge, England, 1988.
13. "Controlled Secretion in Mammalian Cells," 4th ASM Conference on Biotechnology, Orlando, FL, June 22-25, 1989.
14. "Accomplishments in Biochemical Engineering," Int. Biotech. Symposium, Dec. 3-6, Gainesville, FL, 1989.
15. "Pattern Recognition in Fermentation Processes," Keynote Address, 2nd Intern. Symposium in Biochemical Engineering", Stuttgart, March 5-7, 1990.
16. "Intracellular Flux Analysis as Means of Identifying Limiting Nodes in Aminoacid Fermentations," European Conf. on Biotechnology 15, Copenhagen, July 8-13, 1990.
17. "Controlled Protein Secretion in Mammalian Cells," Bioch. Engin. VII, Eng. Foundation Conf., Sta. Barbara, March 1991.
18. "Metabolic Activity Control of the L-Lysine Fermentation by Restrained-Growth Fed Batch Strategies," 2nd US-Korea Joint Seminar of Biochemical Engineering/Biotechnology, Seoul, S. Korea, Dec. 12-17 (1991).
19. "Application of Pattern Recognition Techniques to Fermentation Data Analysis," 5th Int'l. Conf. on Computer Appl. to Ferm. Technology, Keystone, Colorado, April (1992).
20. "Regulation and Control of Metabolic Pathways," Keynote Address, ISKIT '92, Kyushu Inst. of Tech., Iizuka, Japan, July 12-16 (1992).
21. "Fermentation Diagnosis and Control: Balancing Old Tools with New Concepts," 9th Int'l Biotechnology Conference, Crystal City, August 16-21 (1992).
22. "Applications of Metabolic Engineering to Metabolite Overproduction," Keynote Address, Spanish-Portuguese Congress on Biotechnology, Santiago de Compostella, Spain, Sept. 15-18 (1992).
23. "Regulated Secretion in Aid of Protein Purification," Engineering Foundation Conference, Interlaken, Switzerland, Sept. 20-25 (1992).
24. "Expression and Regulated Secretion of Heterologous Proteins in BTC3 Cells," Bioch. Eng. VIII, Princeton, July 11-16 (1993).
25. "Applications of Metabolic Engineering to Amino Acid Overproduction," European Conf. on Biotechnology 6, Florence, June 13-17 (1993).
26. "Problems and Opportunities in Fermentation Control," Keynote Address, First Forum of Young European Researchers, Liege, July 18-23 (1993).
27. "From Unit Operations to Molecular Engineering: Chemical Engineering in Transition," Keynote Address, delivered at the Autonomous U. of Barcelona on the inauguration of the first ChE program in Spain (1993).
28. "Translation Rate Alters Cotranslational Modifications," Cell Culture Engineering Conf. IV, San Diego, CA, March 7-12, 1994.
29. "Two Paradigms of Metabolic Engineering," Eng. Foundation Conf. on rDNA Biotechnology III, Deauville, France, October 16-21, 1994.
30. "Defining the Paradigm of Metabolic Engineering," Special Session of Biochemical Society Meeting on "The Control of Flux: 21 Years On," U. Sussex, Dec. 13-16 (1994).
31. "Directed Modification of Metabolic Networks for the Overproduction of Metabolites and Novel Biomaterials", Biochem. Eng. IX, Engineering Foundation Conf., Davos, Switzerland, May 21-26 (1995).
32. "Metabolic Reaction Network Dynamics", Dagstuhl Conf. on "Modeling and Simulation of Metabolic Regulation and Cell Differentiation", Dagstuhl, Germany, October 1995.

33. "Pattern Recognition for Fermentation Diagnosis and Control", 6th Conf. on Comp. Appl. to Biotechnology (CAB6), Garmisch, Germany, May 14-17 (1995).
34. "Process Monitoring and Process Database Mining", Keynote Address, Cell Culture Eng. V, Engineering Foundation Conference, San Diego, Jan. 28-Feb. 2 (1996).
35. **"Data Management of Fermentation Processes"**, ISPE Meeting, Boston, April 17, 18 (1996).
36. **Flux Amplification in Metabolic Networks**", DoE Conference of Basic Energy Sciences, Argonne Nat'l Lab, May 15, 16 (1996).
37. **"Flux Analysis of Complex Metabolic Networks"**, ONR Workshops on Cellular Controls and Gene Networks, DuPont Hotel, May (1996).
38. **"Metabolic Flux as Fundamental Determinant of Cell Physiology"**, Volkswagen Symposium on Metabolic Flux, U. of Hannover, Feb. (1997).
39. **"Metabolic Engineering,"** NSF Annual Meeting on Metabolic Engineering, Washington, DC, (1997).
40. **"Upgrading the Information Content of Biological Measurements,"** Keynote Address, SIM-ACS, Recent Advances in Fermentation Technologies (RAFT) Meeting, San Diego, Nov. 15-18, 1997.
41. **"Upgrading the Information Content of Biological Measurements,"** AIChE FPBE Division Award Lecturer, Los Angeles, 1997.
42. **"A framework for the study of cell death in culture,"** Cell Culture Engineering VI Conf., Eng'g Foundation Conferences, San Diego, CA, February 7-12, 1998.
43. **"Metabolic fluxes and metabolic engineering,"** BIO 98 Conf., Tokyo I. of Tech., June 5, 1998.
44. **"Emerging directions in computer applications to biotechnology: Upgrading the information content of biological data,"** Plenary Lecture, Computer Applications to Biotechnology (CAB7), Osaka, Japan, June 1-4, 1998.
45. **"Upgrading the information content of process and laboratory data. Applications to fermentation processes and metabolic engineering,"** Foundations of Computer-Aided Process Operations (FOCAPO) Conference, Snowbird, Utah, July 5-10, 1998.
46. **"Application of metabolic engineering methods to the elucidation of bioconversion and complex metabolic networks,"** 2nd Metabolic Engineering Conference, Engineering Foundation, Bavaria, Germany, October 25-30, 1998.
47. "Mining of DNA microarray data." Workshop on "Challenges and opportunities in genomics." Organized by the Institute of Mathematics and its Applications (IMA) of the U. of Minnesota, April 24-27, 1999.
48. "Metabolic engineering of microbial processes: Integrating engineering with genetics and microbiology." Centennial Meeting of the ASM, Chicago, IL, May 30-June 3, 1999.
49. "Application of Metabolic Engineering to indene bioconversion in pharmaceutical manufacturing." 9th European Conf. on Biotechnology, Brussels, 11-15 July, (1999).
50. "Methods for mining DNA microarray data." Plenary Lecture, Biochemical Engineering XI, Eng'g Found'n Conf., Salt Lake City, Utah, 25-30 July, (1999).
51. "Upgrading biological data." Annual SIM Conference, Washington DC, 1-5 August (1999).
52. "Bioinformatics and Metabolic Engineering." 34th annual ASM-Northeast meeting, Worcester, 26-28 October, (1999).
53. "Signal transduction: The new frontier in chip technology and network analysis," Cell Culture Engineering VII, Santa Fe, NM, February 6-10, (2000).
54. "Metabolic Engineering and Bioinformatics," Plenary Lecture, Symposium on *Mastering the Molecules for Manufacturing*, Delft U. Technology, April 17-19, 2000.
55. "Opportunities for engineering research in the post-genomic era," Plenary Lecture, Workshop of the EPSRC Council, London, May 23, 2000.
56. "Research opportunities for biochemical engineering in emerging bioscience," Plenary Lecture, Workshop of the BBSRC Council: From cell function to bioprocessing, London, September 11, 2000
57. "Integration and quantification, the needs of new biology and the engineering ethos," Keynote Lecture, European Symp. on Biochemical Engineering Science, Copenhagen, Sept. 10-13, 2000.

58. "After a decade of progress, an expanded role for metabolic engineering," Metabolic Engineering-III, Colorado Springs, CO, October 22-27, 2000.
59. "Metabolic Engineering: A decade of progress and an expanded future role," Keynote Lecture, BBSRC Workshop on Metabolic Engineering and Directed Evolution, Univ. of Warwick, UK, November 9-10, 2000.
60. "After a decade of progress, an expanded role for Metabolic Engineering," Keynote, M.J. Johnson Award lecture, ACS meeting, San Diego, April 1-5, 2001.
61. "Chemical-Biological Engineering at the forefront of Systems Biology," Symposium on 100th anniversary of Tufts Chemical Engineering, April 20, 2001.
62. "Metabolic Engineering of Indene Biocatalysis in *Rhodococcus* sp." Colloquium on Metabolic Engineering, 101st ASM meeting, Orlando, May 20-24, 2001.
63. "Systems Biology: An emerging new theme in biological research," Keynote Lecture, ESCAPE 11 Conference on Process Systems Applications, Copenhagen, May 27-29, 2001.
64. "Metabolic Engineering: A decade of progress and an expanded new role," Keynote, European Conference in Biotechnology, ECB10, Madrid, July 8-12, 2001.
65. "Pattern discovery in DNA microarray data," Gordon Conference on Bioinformatics, Tilton, NH, August 19-24, 2001.
66. "Metabolic Engineering: What it means to a microbiologist," Plenary, Annual Meeting of General Society for Microbiology, Norwich, UK, September 12-14, 2001.
67. **"Metabolic Engineering: A decade of progress and an expanded future role,"** Keynote, Princeton Symposium on Metabolic Engineering, December 6,7, 2001.
68. **"Biology: the enabling science of the 21st century,"** Plenary, Inaugural conference of the Institute for Biomedical Research, U. of Ioannina, Greece, March 2, 2002.
69. **"Biology as enabling science of the chemical and pharmaceutical industries,"** Plenary, Conference on the New Biology, Center for Advanced Study, U. of Illinois, March 8, 2002.
70. **"Linking genomics to function via metabolic phenotyping,"** Plenary, DIMACS Workshop on complexity in biosystems, Rutgers University, April 7, 2002.
71. **"Application of metabolic engineering to indene biocatalysis for the biosynthesis of chiral drug precursors,"** European symposium on Applied Biocatalysis, Keynote, Villa Olmo, Como, Italy, May 9-11, 2002.
72. **"Metabolic Engineering,"** Keynote, DECHEMA Annual Biotech Meeting, Wiesbaden, June 11-13, 2002.
73. **"Making superior cells by Metabolic Engineering,"** 10th Int'l. Congress of Bacteriology and Applied Microbiology, Paris, July 28-August 1, 2002.
74. **"Functional Genomics: A New Challenge for Biological Reaction Engineering,"** AIChE Annual Meeting, Indianapolis, IN, November 4-8, 2002.
75. **"Metabolic Engineering in a Rapidly Changing World,"** In Honor of Wilhelm Award-recipient, AIChE Annual Meeting, Indianapolis, IN, Reception Room, Indiana Convention Center, November 4-8, 2002.
76. **"Bioinformatics: Principles, Methods and Applications Course at MIT,"** AIChE Annual Meeting, Indianapolis, IN, November 4-8, 2002.
77. **"Microarrays in Metabolic Engineering,"** AAAS Annual Meeting, session on microarrays, Denver, CO, February 16, 2003.
78. **"Biological engineering in a rapidly changing world,"** Plenary, 3rd Conference of ChE in Eastern Mediterranean, Chalkidiki, May 13-15, 2003.
79. **"Novel applications of DNA microarrays,"** 3rd Conference of ChE in Eastern Mediterranean, Chalkidiki, May 13-15, 2003.
80. **"Kinetics of Chemical and Biological Systems,"** Tufts-NSF Workshop on the introduction of biology to the core Chemical Engineering curriculum, Tufts U. Medford, March 12,13, 2004.
81. **"Combinatorial and evolutionary strategies for pathway optimization,"** Keynote, ASM IMAGE Conference, Montreal, May 2004.

82. **"Metabolic engineering: extending the paradigm of reaction engineering to the analysis and design of bioreaction networks,"** Keynote, ISCRE-18 meeting, Chicago, June 6-9, 2004.
83. **"Metabolic Engineering of indene bioconversion,"** Gordon Conference on Biocatalysis, Kimball Union Academy, NH, July 15, 2004.
84. **"Systems biology and biological engineering,"** FOCAPD Conference, Princeton, NJ, July 16, 2004.
85. **"Analysis and quantification of bioreaction metabolic networks,"** Gordon Conference on Enzymes, Coenzymes and Metabolic Pathways, Kimball Union Academy, NH, July 19, 2004.
86. **"Systems Biology,"** Biotechnology Symposium, RPI, August 9, 2004.
87. **"Evolutionary pathway optimization in *Escherichia coli*,"** Metabolic Engineering Conference V, Squaw valley, Lake Tahoe, September 19-23, 2004.
88. **"Functional protein chip for pathway optimization and *in vitro* metabolic engineering,"** First Int'l Conference on Nanotechnology and Bioengineering (ICBN-1), Singapore, September 26-29, 2004.
89. **"Systems Biology,"** Keynote, 12th International Biotechnology Symposium, Santiago, Chile, October 17-22, 2004.
90. **"Metabolic engineering in the post-genomic era,"** Keynote, US-India Chemical Engineering conference, Mumbai, India, December 26-28, 2004.
91. **"Metabolic Engineering for the production of fuels and chemicals,"** Keynote, 27th Biotechnology Symposium for the Production of Fuels and Chemicals, Denver, CO, May 4, 2005.
92. **"Metabolic Engineering in the post-genomic era,"** Keynote, World Congress of Chemical Engineering, Glasgow, July 11, 2005.
93. **"Inverse Metabolic Engineering,"** Keynote, European Federation of Biotechnology Conference, Copenhagen August 21-24, 2005.
94. **"Metabolic Engineering,"** Keynote, Canadian Society for Chemical Engineering Annual Meeting, Toronto, October 17, 2005.
95. **"Metabolomics and Metabolic Engineering,"** Keynote, American Society for Nephrology (ASN) Annual Meeting, November 11, 2005.
96. **"Chemical and Biological Engineering: A New Dimension to a Successful Paradigm,"** Plenary, Mediterranean Conference of Chemical Engineering, Barcelona, November 12-15, 2005.
97. **"Bridging Phenotype and Genetic Pathways with Metabolic State Data. A Global Study of Gcn4-mediated Interactions in Yeast,"** Keynote, *Genomes to Systems* Conference, Manchester, UK, March 22-24 (2006).
98. **"Exploiting Biological Complexity through Systems Approaches,"** Plenary, First Maga Circe Conference on Metabolic Systems Analysis, Monte Circeo, Italy, March 26-29, (2006).
99. **"Fluxes as aid in identifying genetic targets,"** 106th ASM General Meeting, Orlando, Florida, May 21-25, (2006).
100. **"Systems Biology: Learning from the past as we venture into the unknown,"** 106th ASM General Meeting, Orlando, Florida, May 21-25, (2006).
101. **"Global Transcriptional Machinery Engineering,"** Keynote, 10th International Symposium of Genetics of Industrial Microorganisms, Prague, June 24-28, (2006).
102. **"Rethinking cell and metabolic engineering: Eliciting unreachable phenotypes via gTME, global Transcriptional Machinery Engineering,"** Plenary, Annual Conference of the Society for Industrial Microbiology (SIM), Baltimore, MD, July 31-August 3, (2006).
103. **"Tunable promoters for strain analysis and optimization in metabolic engineering,"** Annual Conference of the Society for Industrial Microbiology (SIM), Baltimore, MD, July 31-August 3, (2006).
104. **"Elementary metabolic units (EMU): a novel framework for modeling isotopic tracer distributions,"** Metabolic Engineering Conference VI, October, The Netherlands, (2006).
105. **"Global Transcriptional Machinery Engineering,"** International Conference on Biomolecular Engineering, San Diego, CA, January 14-18, (2007).

106. **"Engineering Transcription: a new powerful tool for metabolic and cell engineering,"** 2nd ASM conference on Integrating Metabolism and Genomics-IMAGE2, Montreal April 30-May 3, Keynote, (2007).
107. **"Metabolic Engineering: Engineering microbes for production of biochemical products,"** Synthetic Biology 3.0 International Conference, Zurich, June 2007.
108. **"Elucidating the role of global regulators using the holistic approaches of Metabolic Engineering,"** 13th European Congress of Biotechnology, ECB 13, Barcelona, September 16-19, 2007.
109. **"Channeling the power of microbial genomics to engineering microbes for biofuel production and other applications,"** Plenary, 15th Annual International Conference on Microbial Genomics, September 16-20, 2007, Univ. of MD College Park Campus.
110. **"Strategic assessment of prospective biomass-to-biofuel (B2B) conversion processes,"** Plenary, Sustainable biorefineries topical conference, AIChE Annual Meeting, Salt Lake City, November 2007.
111. **"Evaluating the potential of *Transcriptional Engineering* in eliciting new multigenic cellular phenotypes,"** XV Biochemical Eng. Conference, Quebec City, July 2007.
112. **"Strategic assessment of prospective biomass-to-biofuel (B2B) conversion processes,"** Plenary, International Conf. on Biorefineries, Beijing, October 20-23- 2007.
113. **"Using transcriptional engineering to elicit new multigenic cellular phenotypes,"** Plenary, Int'l Symposium on Frontiers of Ind. Biotechnology, Tokyo, January 25, 2008.
114. **"Challenges in microbe engineering for biofuel production,"** 2008 AAAS Annual Meeting, Boston, MA, 14-18 February, 2008.
115. **"Transcriptional engineering: a new method for eliciting new multigenic cellular phenotypes,"** Plenary, Joint Annual Meeting of VAAM/GBM Societies, Frankfurt, March 9-11, 2008.
116. **"Combining the chemistry of life with the chemistry of man to generate new sources of liquid transportation fuels,"** Plenary, Conference on energy crisis, water shortage and climate changes in the Mediterranean area: the involvement of chemistry, Academia Nazionale dei Lincei, Castiglione della Pescaia, Italy, May 2-6, 2008.
117. **"The holistic nature and systems-based tools of Metabolic Engineering,"** Annual FEBS Conference, Athens Greece, June 28-July 3, 2008.
118. **"Transcriptional, metabolomic and flux data: what are they good for?"** Plenary, Annual conference of the Metabolomics Society, Park Plaza Hotel, Boston, September 4-7, 2008.
119. **"Rational or combinatorial? Real metabolic engineers do both,"** Plenary, 7th Metabolic Engineering Conference, Puerto Vallarta, Mexico, September 14-18, 2008.
120. **"Integrating cell-wide data for biomarker identification and elucidation of cell physiology,"** Keynote, 13th International Biotechnology Symposium, Dalian, China, October 12-16, 2008.
121. **"Dissecting plant metabolism via *in situ* flux determination with stable isotopic tracers,"** Howard Hughes Medical Institute, Workshop on Future Horizons in Plant Sciences, Chavy Chase, MD, January 7-9, 2009.
122. **"Biofuels and Biochemical Engineering,"** Plenary Amgen Lecture, XVI Biochemical Engineering Conference, Burlington VT, July 2009.
123. **"Metabolic Engineering for Biofuels,"** Keynote Lecture, "Tailor Made Fuels from Biomass Int'l Conference", Aachen, Germany, June 24-25, 2009.
124. **"Renewable Fuels from Coal and Biomass: An NRC Report,"** Panel and presentation at the Annual AIChE meeting, Nashville, 2009.
125. **"Defining plant phenotype via flux analysis,"** Howard Hughes Medical Institute, Workshop on Future Horizons in Plant Sciences, January 7-9, 2009.
126. **"Metabolic flux: key indicator of cell physiology and determinant of cell and metabolic engineering,"** Workshop on Network Biology, Math. Biosciences Institute, OSU, September 15, 2009.
127. **"Renewable fuels from coal and biomass: Review of NRC report,"** NAE Annual meeting, section 3, October 2009.

128. **"Metabolic engineering of isoprenoid metabolism in *E. coli* for overproduction of taxol precursors,"** Keynote, 14th European Congress on Biotechnology, Barcelona, Spain, September 13-16, 2009.
129. **"Biofuels and Metabolic Engineering,"** Plenary, E.V. Murphree Award Lecture, ACS Annual Meeting, San Francisco, CA, March 21, 2010.
130. **"Pathway optimization for tyrosine and flavonoid biosynthesis in *Escherichia coli*,"** Plenary, IEEE International Conference on Bioinformatics and Bioengineering, Philadelphia, PA, June 1-3, 2010.
131. **"Metabolic Engineering: enabling technology for the production of biofuels and bio-based products,"** Plenary, Samsung Advanced Institute of Technology, Seoul, Korea, June 11, 2010.
132. **"Technologies and markets of a new sustainable bio-based economy,"** Plenary, 4th China Bioindustry Convention, Jinan, PRC, June 18-20, 2010.
133. **"Microbial oil production from renewable feedstocks,"** Invited, 8th International Conference of Metabolic Engineering, Jeju Island, Korea, June 13-17, 2010.
134. **"Cancer as a Metabolic Disease,"** Plenary, 8th Pathways, Networks and Systems Conference, Rhodes, July 9-14, 2010.
135. **"Developing an integrated picture of tumor cell physiology using isotope tracer data and Metabolic Flux Analysis,"** Plenary, 14th International Biotechnology Symposium, Rimini, Italy, September 14-18, 2010.
136. **"Challenges in biofuel production from renewable feedstocks,"** Plenary, Gothenburg Life Sciences Conference XI, Gothenburg, Sweden, August 18-20, 2010.
137. **"After a decade of systems biology it is time for a report card,"** Plenary, Annual German Conference on Bioinformatics, Braunschweig, September 20-22, 2010
138. **"Biofuels" panel of the World Future Energy Summit (WFES),** Abu Dhabi, January 2011.
139. **"A metabolic engineering platform for the discovery and production of new therapeutics,"** IOM Workshop on Synthetic and Systems Biology, Washington DC, March 14-16, 2011.
140. **"New technologies for biofuels production,"** Lectio Magistralis, University of Urbino (on the occasion of the 2011 Eni Award on Renewable and non-Conventional Energy, Urbino, Italy, June 2011).
141. **"Metabolic and protein engineering,"** Plenary, 25th Anniversary Symposium of the Protein Society, Boston, MA, July 23, 2011.
142. **"Deciphering photoautotrophic growth and metabolism using stable isotopic tracers and Metabolic Flux Analysis,"** Keynote, GRC Conference on Plant Metabolic Engineering, Waterville Valley, NH, July 24-29, 2011.
143. **"New metabolic engineering strategies for microbes,"** Keynote, 10th Lactic Acid Bacteria Conference, LAB10, Egmond aan Zee, The Netherlands, August 28-September 1, 2011.
144. **"Metabolic Engineering: synthetic chemistry for the 21st century,"** Keynote, Conference on the International Year of Chemistry, Accademia Nazionale dei Lincei, Milan, October 3, 2011.
145. **"Microbe and bioprocess engineering for total carbon conversion to biofuels,"** 1st Int'l conference on Electrofuels, organized by SBE, Providence RI, November (2011).
146. **"Towards a biobased economy,"** Inaugural lecture at the Academy of Athens, January 2012.
147. **"Metabolic engineering: synthetic chemistry of the 21st century,"** Keynote, Conference on process technology for the Future World, Delft University of Technology, March, 2012.
148. **"Metabolic engineering: synthetic chemistry of the 21st century,"** Keynote, Biotechnology conference, China, Beijing, May, 2012.
149. **"Metabolic engineering: synthetic chemistry of the 21st century,"** Keynote, Hougén Symposium, University of Wisconsin, May, 2012.
150. **"Linking cancer and metabolism via isotopic labeling and metabolic network analysis,"** Conference on Regulation of Metabolism in Cancer, Cold Spring Harbor Lab, June, 2012.
151. **New frontiers of Metabolic Engineering: Linking Cancer and Metabolism via Isotope labeling and Network Analysis,"** Keynote, 9th Metabolic Engineering Conference, Biarritz, France, June 2012.
152. **"Overview of synthetic biology applications in industry,"** NAE-NAS joint conference on Synthetic and Systems Biology, Washington DC, June 12-13, 2012.

153. "Vision of a new Biotechnology for the 21st century as key enabler of a sustainable bio-based economy," 15th International Biotechnology Symposium, Plenary, Daegu, Korea, September 17-20, 2012.
154. "Metabolic Engineering: Enabling technology of biological processes for CO₂ utilization," 2nd Inter'l conference on large volume CO₂ utilization," Lyon, Plenary, France, September 27, 28, 2012.
155. "Chemistry vs. biotechnology: Protagonists of the creative destruction transforming the manufacturing of fuels and chemicals," Plenary, Novo Foundation conference, Copenhagen, May 5-8, 2013.
156. "Plants: the key to a sustainable bioeconomy," Plenary, 7th Conference of Plants Research, European Plant Science Organization, Porto Heli, Greece, September 1-5, 2013.
157. "Linking cancer and metabolism via isotopic labeling and network analysis," Keynote, 14th International Conference of Systems Biology, Copenhagen, August 31-September 4, 2013.
158. "Future strategies and research challenges in Metabolic Engineering," Plenary, EnergyThink: Green chemistry for sustainable processes, Conference organized by Eni and Legambiente, Bologna, November 27, 2013.
159. "Design criteria in the engineering of oleaginous yeast strains for lipid overproduction," Plenary, DOE meeting, Crystal City, Arlington, VA, February 11, 2014.
160. "Developing the bioprocesses of a sustainable bioeconomy using Biotechnology and Metabolic Engineering," Plenary, 3rd Bioeconomy Forum, Sao Paulo, Brazil, 23 October, 2014.
161. "Advancing a sustainable bio-economy in Brazil," Plenary, Inaugural Conference, Brazilian Industrial Biotech Association, Sao Paulo, Brazil, 29 April, 2014.
162. "Biomass to products: Potential, reality check and major challenges," DOE Bioenergy Workshop, Washington DC, June 23, 24, 2014.
163. "Metabolic Engineering: synthetic chemistry for the 21st century," Plenary, Conference on Biotechnology, East China U. of Science and Technology, Shanghai, June 2, 2014.
164. "A microfluidic, high throughput, screening system for the selection of extracellular product over-producing microbes," Plenary, Low carbon emissions University Alliance Conference, Beijing, June 4, 2014.
165. "Engineering organisms and processes for cost-effective lipid production," Keynote, 10th Metabolic Engineering Conference, Vancouver, BC, June 15, 2014.
166. "The vision of a sustainable bioeconomy in an era of \$50 oil," Ho-Am Forum, Seoul, South Korea, June 1-2, 2015.
167. "The vision of a sustainable bioeconomy in an era of \$50 oil," CAPEC-Annual Lecture, Danish Technical University, Lyngby, DK, September 25, 2015.
168. "The vision of a sustainable bioeconomy in an era of \$50 oil," Keynote, Annual AIChE meeting, Salt Lake City, November 2015.
169. "Engineering ethanol tolerance in yeast," ICYGMB-27th International Conference on Yeast Genetics and Molecular Biology, Levico Terme (Trento, Italy), 6-12 September 2015.
170. "AIChE," NAE Annual meeting, section 3, Washington DC, October 2015. Same lecture was also given to 8 ChE departments.
171. "Transforming the chemical industry via Biotechnology and Metabolic engineering," Opening Plenary, 1st Metabolic Engineering Summit, Beijing, China, November 30-December 2, 2015.
172. "What does it take to engineer microbes for industrial applications?" Salk Ipsen Science Symposium on Synthetic Biology, January 21, 2016.
173. "Biological routes to methane activation and conversion to fuels and chemicals," NAE-NAS Panel: The Changing Landscape of HC Feedstocks for Chemical Production Implications for Catalysis, Washington DC, March 7-8, 2016.
174. "Engineering microbial metabolism for the production of fuels and chemicals," Plenary, Annual Conference of the Association for General and Applied Microbiology-VAAM-2016, Jena, Germany, March 13-16, 2016.
175. "The role of chemical engineers in Biotechnology and other emerging technologies," National Technical University of Athens, March 22, 2016.

176. **“Rewiring metabolism to maximize lipid overproduction in *Yarrowia lipolytica*,”** Keynote, Metabolic Engineering Conference 11, Awaji, Japan, June 26-30, 2016.
177. **“Engineering microbial metabolism for the production of chemicals,”** Plenary, Biocatalysis Gordon research Conference, New England University, July 10-14, 2016.
178. **“Engineering microbes for industrial applications,”** 13th International Symposium on the Genetics of Industrial Microorganisms (GIM), Wuhan, China, October 16-20, 2016.
179. **“Upgrading waste for food, fuel and chemical production via Metabolic Engineering,”** International Conference on Metabolic Science, Shanghai, China, October 20-23, 2016.

2. Invited Seminars

University of California, Berkeley, Dept. of Chemical Engineering, 1978
 University of Houston, Dept. of Chemical Engineering, 1978
 Cornell University, School of Chemical Engineering, 1978
 University of Michigan, Dept. of Chemical Engineering, 1978
 California Institute of Technology, Dept. of Chemical Engineering, 1978
 Purdue University, School of Chemical Engineering, 1980
 Stanford University, Dept. of Chemical Engineering, 1981
 Delft University of Technology, Dept. of Applied Microbiology, 1981
 Delft University of Technology, Department of Biotechnology, 1981
 Technical University of Denmark, Dept. of Chemical Engineering, 1981
 Massachusetts Institute of Technology, Dept. of Chemical Engineering, 1983
 University of California, Davis, Department of Chemical Engineering, 1983
 Rice University, Department of Chemical Engineering, 1983
 University of Pennsylvania, Dept. of Chemical Engineering, 1983
 Carnegie-Mellon University, Dept. of Chemical Engineering, 1983
 California Institute of Technology, Environmental Eng. Sci., 1983
 University of Minnesota, Dept. of Chemical Engineering, 1984
 University of California, San Diego, Dept. of Chemical Engineering, 1985
 University of Massachusetts, Department of Chemical Engineering, 1985
 Tufts University, Department of Chemical Engineering, 1985
 Lehigh University, Department of Chemical Engineering, 1986
 Worcester Polytechnic Institute, Dept. of Chemical Engineering, 1986
 Rensselaer Polytechnic Institute, Dept. of Chemical Engineering, 1986
 University of Texas, Austin, Dept. of Chemical Engineering, 1987
 University of Colorado, Department of Chemical Engineering, 1987
 Polytechnic Institute of New York, Dept. of Chemical Engineering, 1987
 Newcastle University, Department of Chemical Engineering, 1987
 Ecole Polytechnique, de Montreal Dept. of Chemical Engineering, 1988
 Swiss Federal Institute of Technology (ETH), Dept. of Chem. Eng., 1988
 Rice University, Department of Chemical Engineering, 1989
 University of Houston, Dept. of Chemical Engineering, 1989
 Texas A&M Univ. Dept. of Chemical Engineering, 1990
 University of Washington, CPAC, 1990
 University of Puerto Rico, 1991
 Massachusetts General Hospital, 1991
 New Jersey Institute of Technology, Dept. of Chemical Engineering, 1991
 Nagoya University, Department of Chemical Engineering, 1992
 Institute of Chemical and Physical Research, RIKEN, Tokyo, 1992

Georgia Institute of Technology, Dept. of Chemical Engineering, 1992
Purdue University, Dept. of Chemical Engineering, 1992
Osaka University, Department of Biotechnology, 1992
Stellenbosch University, Department of Biochemistry, 1992
University of Cape Town, Department of Chemical Engineering, 1992
Tokyo Institute of Technology, Tokyo, 1992
Yamaguchi University, Department of Chemical Engineering, 1992
Rutgers University, Department of Chemical Engineering, 1992
Northwestern University, Dept. of Chemical Engineering, 1993
University of Illinois, Retreat on Molecular Genetics, 1993
University of Minnesota, Dept. of Chemical Engineering, 1994
Technical University of Denmark, Dept. of Biotechnology, 1994
Cornell University, Department of Chemical Engineering, 1994
Johns Hopkins University, Dept. of Chemical Engineering, 1994
City College of New York, Dept. of Chemical Engineering, 1996
University of Michigan/Michigan State University Annual Joint Seminar, 1996
University of Illinois, Dept. of Chemical Engineering, 1996
University of California, Berkeley, Dept. of Chemical Engineering, 1996
Tulane University, Dept. of Chemical Engineering, 1997
University of California, Los Angeles, Dept. of Chemical Engineering, 1997
University of California, Santa Barbara, Dept. of Chemical Engineering, 1997
University of Delaware, Dept. of Chemical Engineering, 1997
University of Wisconsin, Dept. of Chemical Engineering, 1997
Rice University, Dept. of Chemical Engineering, 1998
Imperial College, Process Engineering Center, 1999
University of Massachusetts, Amherst, 1999
Penn State University, Dept. of Chemical Engineering, 1999
Catholic University of Chile, Dept. of Chemical Engineering, 2000
University of Chile, Dept. of Chemical Engineering, 2000
University of Utah, Department of Bioengineering, 2000
University of Florida, Dept. of Chemical Engineering, 2000
Harvard Medical School, Mass. General Hospital, 2000
University of Texas at Austin, Department of Chemical Engineering, 2001
University of Virginia, Department of Chemical Engineering, 2002
Rutgers University, Department of Chemical and Biochemical Engineering, 2002
TIGR, The Institute for Genomic Research, May 2002
MIT, Department of Chemical Engineering, 2002
Colorado State University, Department of Chemical Engineering, March 2003
Harvard University, Bauer Center for Genomics Research, March 2004
Georgia Institute of Technology, Department of Chemical & Biomolecular Engineering, March 2004
Johns Hopkins University, Department of Chemical & Biomolecular Engineering, April 2004
Rensselaer Polytechnic Institute, Biotechnology Symposium, September 2004
National University of Singapore, SMA program, September 2004
University of Toronto, departments of Chemical and Biomedical Engineering, March 2005
Rice University, Department of Chemical and Biomolecular Engineering, April 2005
DTU, Danish Technical University, April 2005
ETH Zurich, Mech. Engineering, Bioprocess Laboratory, March 2, 2007
ETH Zurich, Mikrobiologisches Kolloquium, at the Institute of Microbiology, April 2007
University of Saarbrücken, Germany, May 21, 2007
Tianjin University, October 2007
Beijing University of Chemical Technology, October 2007

Tsinghua University, October 2007
 Imperial College, Distinguished Lecture Series, May 2009
 Samsung Advanced Institute of Technology, Seoul, Korea, June 11, 2010
 University of Illinois Urbana-Champaign, October 5, 2010
 Demokritos, National Center for Scientific Research, Athens, September 30, 2011
 KAIST, Department of Chemical and Biomolecular Engineering, Korea, September 2012
 Postech, Department of Chemical and Biological Engineering, Korea, September, 2012
 Skoltech Open University, October 7, 2013
 Milano Polytechnico, November 25, 2013
 University of Milano, Bicocca, December 4, 2013
 Milano Polytechnico, December 13, 2013
 Wuhan University, June, 2014
 East China University of Science and Technology, Shanghai, June 2, 2014
 Jiangnan University, China, May 29, 2015
 Tsinghua University, Beijing, December 1, 2015
 Princeton University, October 28, 2015
 University of California, Berkeley, November 4, 2015
Amgen, "Metabolic Engineering: the ultimate continuous pharmaceutical manufacturing," Jan. 19, 2016.
National Technical University of Athens, "The role of chemical engineers in biotechnology and other emerging technologies," March 22, 2016.
Osaka University, "The vision of a sustainable biotechnology in a \$50 era," July 1, 2016.

Papers at Technical Meetings

1. "Analysis of the Possibilities of Coexistence of Competing Microbial Populations in Continuous Flow Systems," Paper 17 of MBT Division, 178th National ACS Meeting, Washington, D.C., September 1979.
2. "Analysis of the Dynamics of a Biochemical Reactor Subject to Stochastic and Periodic Inputs," Paper 109E, 72nd Annual AIChE Meeting, San Francisco, CA, November 1979.
3. "A Distributed Model for the Dynamics of Microbial Predation," Paper 90B, 72nd Annual AIChE Meeting, San Francisco, CA, November 1979.
4. "State Estimation for Computer Control of Biochemical Reactors," VI International Fermentation Symposium, London, Ontario, Canada, July 1980.
5. "Dynamics and Control of Mixed Cultures of Commensal Populations," Paper 74 of MBT Division, 180th National ACS Meeting - 2nd Chemical Congress of the North American Continent, Las Vegas, Nevada, August 1980.
6. "Dynamics and Control of a Fermentor for Cellulose Decomposition by a Mixed Culture of Commensal Populations," Paper 104E, 73rd Annual AIChE Meeting, Chicago, IL, November, 1980.
7. "Hydrogen Oxidation of Platinum: A Fourier Analysis of the Reaction Rate Time Series," Paper 9b, 73rd Annual AIChE Meeting, Chicago, IL, November, 1980.
8. "Data Handling for On-Line Monitoring of Growing Microbial Cultures," Paper 74 of MBT-IEC Divisions, 182nd National ACS Meeting, New York, NY, August 1981.
9. "Optimal Control Policy for Substrate-Inhibited Kinetics with Enzyme Deactivation in an Isothermal CSTR," Paper 58f, 74th Annual AIChE Meeting, New Orleans, LA, November 1981.
10. "The Application of Filtering Theories and Macroscopic and Elemental Balances for the On-Line Estimation of Growing Microbial Cultures," Paper 86e, 74th Annual AIChE Meeting, New Orleans, LA, November 1981.

11. "On-Line Estimation of the State of Biochemical Reactors," presented at the 7th International Conference of Chemical Reaction Engineering, Boston, MA, October 1982.
12. "Estimation of the Entropy of Formation of *E. coli* Biomass by Statistical Methods," Paper 85b, 75th Annual AIChE Meeting, Los Angeles, CA, November 14-19, 1982.
13. "Gross Error Identification," Paper 50b, 76th Annual AIChE Meeting, Washington, D.C., October 30 - November 4, 1983.
14. "Application of Bioenergies and Macroscopic Balances to Bioreactor Identification," Paper 33c, 76th Annual AIChE Meeting, Washington, D.C., October 30 - November 4, 1983.
15. "Effect of pH Oscillations to the Experimental Stability of a Competing Mixed Culture," 77th Annual AIChE Meeting, San Francisco, November 1984.
16. "Bioreactor Identification," ACS Meeting, Philadelphia, PA, August 1984.
17. "A Novel Fermentor Design for Simultaneous Fermentation and Cell Recycle," 3rd European Conference on Biotechnology, Munich, September 10-14, 1984.
18. "Effect of pH Oscillations on Competing Mixed Cultures," Papers 62b, 77th Annual AIChE Meeting, San Francisco, CA, November 25-30, 1984.
19. "Optimal Control of Singular Systems with State Constraints. Application Optimization of the Fed Batch Penicillin Fermentation," Paper of MBT Division, National ACS Meeting, Chicago, IL, September 8-13, 1985.
20. "An Inverse Pasteur Effect of *Saccharomyces cerevisiae* in Microaerobic Chemostat Culture," Paper of MBT Division, National ACS Meeting, Chicago, IL, September 8-13, 1985.
21. "A Novel Bioreactor-Cell Precipitator Combination for High-Cell Density, High-Flow Continuous Fermentations," Paper of MBT Division, National ACS Meeting, Chicago, IL, September 8-13, 1985.
22. "The Modelling of Biological Processes with Delays," Paper of MBT Division, National ACS Meeting, Chicago, IL, September 8-13, 1985.
23. "Mechanistic Study of Microaerobic Ethanol Production by *Saccharomyces cerevisiae* in Continuous Culture," Paper 75f, 78th Annual Meeting, Chicago, November 10-15, 1985.
24. "The Use of a Fermentation Equation for Determining Carbon and Energy Metabolism in Hybridoma Cell Cultures," Paper 7c, 78th Annual Meeting, Chicago, November 10-15, 1985.
25. "Coexistence of *S. cerevisiae* and *E. coli* in a Chemostat under Conditions of Substrate Competition and Product Inhibition," Paper 92a, 78th Annual Meeting, Chicago, November 10-15, 1985.
26. "Bioreactor Stability and Control in the Presence of Time-Lag Effects," Paper 29, MBT Division, ACS Annual Meeting, Anaheim, CA, September 1986.
27. "The Prediction of Transient Bioreactor Behavior from Steady-State Data," Paper 96, MBT Division, ACS Annual Meeting, Anaheim, CA, September 1986.
28. "An Optimal Feeding Strategy for Fed-Batch Penicillin Fermentation," Paper 76i, Annual AIChE Meeting, Miami Beach, November 1986.
29. "Computer-Aided Modeling of Bacteria Cells: The Use of Expert Systems," Paper 93b, Annual AIChE Meeting, Miami Beach, November 1986.
30. "Estimation of the Growth Associated Time-Lag Parameters in a Fermentor," Paper 125a, Annual AIChE Meeting, Miami Beach, November 1986.
31. "Order of Magnitude Analysis and Reasoning in the Modeling of Biochemical Pathways, Paper 152e, Annual AIChE Meeting, New York, November 1987.
32. "An Intelligent System for the Design of Biochemical Pathways," Paper 170b, Annual AIChE Meeting, New York, November 1987.
33. "Interactions Between Genetics and Engineering in Recombinant Mammalian Cells: the SV40 System," Paper 159f, Annual AIChE Meeting, New York, November 1987.
34. "Controlled Protein Secretion in Mammalian Cells. A Model System," Paper 160d, Annual AIChE Meeting, New York, November 1987.
35. "Cross-Flow Monolithic Bioreactor for Enhanced Oxygen Transfer in High-Cell Density Mammalian-Cell Cultures," Paper 161a, Annual AIChE Meeting, New York, November 1987.

36. "On-Line Monitoring of Cellular Metabolism," Paper 163g, Annual AIChE Meeting, New York, November 1987.
37. "Cross-Flow Monolithic Bioreactor for Cell Culture," Cell Culture Conf., Engineering Foundation Conf., Palm Coast, FL (1988).
38. "Determination of Intracellular Carbon Fluxes in Mammalian Cells," MBT Division, Annual ACS Meeting, Los Angeles, CA (1988).
39. "Engineering Aspects of Regulated Protein Secretion in Animal Cell Cultures," MBT Division, Annual ACS Meeting, Los Angeles, CA (1988).
40. "Reduction of Waste Accumulation in Cultured Mammalian Cells: The Lactate Dehydrogenase Inhibition By Anti-sense RNA Technology," MBT Division, Annual ACS Meeting, Los Angeles, CA (1988).
41. "A Rational Approach to Strain Improvement Through Metabolic Engineering: Applications to Lysine Fermentations," Biochemical Engineering VI, Engineering Foundation Conference, Santa Barbara, CA (1988).
42. "Convective Nutrient Transfer in Porous Particles with Immobilized Cells," Annual AIChE Meeting, Washington, D.C., November (1988).
43. "Studies of Lactate Dehydrogenase Inhibition By Anti-Sense RNA Technology," Annual AIChE Meeting, Washington, D.C., November (1988).
44. "Regulated and Constitutive Secretion of Proteins in Animal Cells: An Integrated View," Annual AIChE Meeting, Washington, D.C., November (1988).
45. "Directed Metabolic Flux as a Means of Product Yield Improvement," Annual AIChE Meeting, Washington, D.C., November (1988).
46. "Use of Metabolic Perturbations in the Identification of Rate Limiting Fluxes in Aminoacid Fermentations," Paper 31 MBTD, ACS Meeting, Miami Beach, Sept. 10-15 (1989).
47. "The Characterization and Use of Regulated Protein Secretion in Mammalian Cell Culture," Paper 86, MBTD, ACS Meeting, Miami Beach, Sept. 10-15 (1989).
48. "Pattern Recognition in Fermentation Processes," Paper 163, MBTD, ACS Meeting, Miami Beach, Sept. 10-15 (1989).
49. "Metabolic Perturbations as a Means of Identifying Rate Limiting Fluxes in Amino Acid Production," Paper 29c, AIChE Annual Meeting, San Francisco (1989).
50. "Factors Involved in the Optimization of Production Schemes Employing Regulated Secretion of Proteins," Paper 33f, AIChE Annual Meeting, San Francisco, (1989).
51. "The Use of Light Scatter Spectra to Estimate Cell Concentration in the Presence of Solid Substrate," Paper 148h, AIChE Annual Meeting, San Francisco, (1989).
52. "Intracellular Metabolic Fluxes in Hybridoma Cell Culture," 2nd Engineering Foundation Conference on Cell Culture, Santa Barbara, December, (1989).
53. "Porous Microcarriers for Cell Culture," Pacificchem Meeting, Honolulu, Dec. 17-22 (1989).
54. "Optical Sensor for Biomass in the Presence of Solid Substrates," ACS Meeting, Boston, April 23-27 (1990).
55. "Restrained Growth Fed-Batch Culture as Means of Manipulating Cellular Metabolism," ACS National Meeting, Washington, DC, Paper 20 Biot. Div., August 26-31, (1990).
56. "Elucidation of Enzyme Control Architecture Associated with Metabolic Rigidity in Lysine Synthesis," Annual AIChE Meeting, Chicago, November 11-16 (1990).
57. "A Single-Pass Ceramic Matrix Bioreactor for High Density Mammalian Cell Culture," Annual AIChE Meeting, Chicago, November 11-16 (1990).
58. "Porous Ceramic Beads for Animal Cell Culture," Annual AIChE Meeting, Chicago, November 11-16 (1990).
59. "Restrained Growth Fed-Batch Operational Strategy for Improved L-Lysine Fermentation Performance," Annual AIChE Meeting, Chicago, November 11-16 (1990).
60. "Culture Instability of Auxotrophic Amino Acid Producers," ACS Meeting, New York City, August 25-30 (1991).

61. "Controlled Protein Secretion in a Single-Pass Ceramic Matrix Bioreactor," Annual ACS Meeting, New York City, August 25-30 (1991).
62. "Effects of Substratum Morphology on Animal Cell Adhesion and Behavior," Paper 254d, Annual AIChE Meeting, Los Angeles, Nov. 17-22, (1991).
63. "A Stochastic Model of Cell Growth and Oxygen Transport in Disordered Porous Substrates," Paper 255b, Annual AIChE Meeting, Los Angeles, Nov. 17-22, (1991).
64. "Processing and Secretion of Insulin Related Peptides in an Insulinoma Cell Line," Paper 265b, Annual AIChE Meeting, Los Angeles, Nov. 17-22, (1991).
65. "Metabolic Flux Analysis Applied to the Effect of Oxygen," Paper 267b, Annual AIChE Meeting, Los Angeles, Nov. 17-22, (1991).
66. "Metabolic Engineering of the L-Lysine Fermentation by Respiratory Based Fed-Batch Strategies," Paper 274 b, Annual AIChE Meeting, Los Angeles, Nov. 17-22, (1991).
67. "Effect of Substratum Morphology on Animal Cell Adhesion and Behavior," Materials Research Society, paper T4.9, Fall (1991).
68. "Use of Principal Component Models for On-Line Supervision and Off-Line Analysis of Bioprocesses," Paper 129c, Annual AIChE Meeting, Miami Beach, Nov. 1-6 (1992).
69. "Flow Cytometry Studies on the Effects of Carbohydrates on α -Amylase Expression in *Bacillus subtilis*," Paper 157b, Annual AIChE Meeting, Miami Beach, Nov. 1-6, (1992)
70. "Identification and Manipulation of Heterogeneous Gene Expression in *Bacillus subtilis* Through Genetic Modulation of the Central Stationary Phase Transcription Factor SpoOA," Paper 111e, Annual AIChE Meeting, St. Louis, Nov. 7-12 (1993).
71. "Control of Cell Behavior by Engineering Substrates with Defined Surface Chemistry," Paper 120j, Annual AIChE Meeting, St. Louis, Nov. 7-12 (1993).
72. "Redirection of Carbon Flux at a Threonine Metabolic Branchpoint by Controlled Enzyme Overexpression," Paper 113m, Annual AIChE Meeting, St. Louis, Nov. 7-12 (1993).
73. "Translation Rate Alters Cotranslational Modifications: Studies on the Glycosylation Site Occupancy of Recombinant Human Prolactin, Paper 117i, Annual AIChE Meeting, St. Louis, Nov. 7-12 (1993).
74. "Effects of Mutation of Pyruvate Kinase and PEP Carboxylase Genes on L-Lysine Production by *Corynebacterium glutamicum*." Paper 36g, Annual AIChE Meeting, San Francisco, Nov. 13-18 (1994).
75. "Stochastic Simulation of Protein Glycosylation," Paper 240c, Annual AIChE Meeting, San Francisco, Nov. 13-18 (1994).
76. "Investigation of H4D Branch Point Fluxes in the Lysine Biosynthetic Pathway of *Corynebacterium* using C13-NMR", Paper 133, ACS Meeting, Anaheim, CA, April 1995.
77. "Environmental Factors Influencing the Ability of bcl-2 to Protect Cell Viability", Paper 30, ACS Meeting, Anaheim, CA, April 1995.
78. "Analysis of Flux Distributions at Branchpoints in *C. glutamicum* Using C13-NMR", Paper 212a, Annual AIChE Meeting, Miami Beach, November, 1995.
79. "Automated FIA-Immunoanalysis System for Monitoring the Product Quantity and Quality of Cell Cultivation Processes", Paper 204e, Annual AIChE Meeting, Miami Beach, November, 1995.
80. "Manipulation of Glycosylation Site Occupancy of Recombinant Human Prolactin", 203e, Annual AIChE Meeting, Miami Beach, November, 1995.
81. "Pattern Recognition Applications to Fermentation Database Mining", Paper 211b, Annual AIChE Meeting, Miami Beach, November, 1995.
82. "Identification of Bioprocess Performance Symptoms and Causes by Pattern Recognition", Symposium #555 Advances in Bioprocess Engineering, Pacificchem '95, Honolulu, Hawaii, Dec. 1995.
83. "Metabolic Engineering", Paper 218a, Annual AIChE Meeting, Chicago, November 10-15, 1996.
84. "Extension of Sp2/0 Viability Through IL-6 Supplementation", Paper 180f, Annual AIChE Meeting, Chicago, November 10-15, 1996.
85. "Metabolic Engineering," Paper 117, 214th Annual ACS Meeting, Las Vegas, NV Sept. 7 -11, 1997.

86. "Glycosylation Site Occupancy in Continuous Culture of CHO Cells Producing Recombinant g-interferon." Paper 229b, Annual AIChE Meeting, Los Angeles, CA, Nov. 16-21, 1997.
87. "Bioprocess Database Mining," Paper 235i, Annual AIChE Meeting, Los Angeles, CA, Nov. 16-21, 1997.
88. "Investigation of the Role of Biotin in Aminoacid Production," Paper 240g, Paper 235i, Annual AIChE Meeting, Los Angeles, CA, Nov. 16-21, 1997.
89. "Metabolic Studies of Cell Death Induced by Genetic or Environmental Means in Steady State Chemostat Cultures," Paper 241H, Paper 235i, Annual AIChE Meeting, Los Angeles, CA, Nov. 16-21, 1997.
90. "Upgrading the Information Content of Biological Measurements," Paper 55f, Paper 235i, Annual AIChE Meeting, Los Angeles, CA, Nov. 16-21, 1997.
91. "Indene bioconversion network in *Rhodococcus*.: A target for application of metabolic engineering," 216th ACS National Meeting, Boston, MA, August 23-27, 1998.
92. "Enhancement of Cell Culture Viability using Cell Cycle Arresting Agents, 216th ACS National Meeting, Boston, MA, August 23-27, 1998
93. "Dynamic Analysis of the MAP Kinase Signal Transduction Pathway," Paper 277g, AIChE Annual Meeting, Miami, FL, November 15-20, 1998.
94. "Design of Isotopic Labeling Experiments for Metabolic Flux Quantification," Paper 268c, AIChE Annual Meeting, Miami, FL, November 15-20, 1998.
95. "The Effect of Bcl-2 Overexpression on the Physiology of Hybridoma Cells Cultivated in Glutamine-limited Chemostat Cultures," Paper 266h, AIChE Annual Meeting, Miami, FL, November 15-20, 1998.
96. "Metabolic Engineering Applications to an Indene Bioconversion Network," Paper 272j, AIChE Annual Meeting, Miami, FL, November 15-20, 1998.
97. "Bioinformatics and beyond," AIChE Annual Meeting, Miami, FL, November 15-20, 1998.
98. "Green biosynthesis of polyhydroxyalkanoates: Engineering of cyanobacteria for biopolymer production," 4th annual green chemistry and engineering conference, ACS, Washington, D.C., June 2000.
99. "Coexpression of Cloned Genes by Quiescent CHO Cells Using Bicistronic Retroviral vectors," ACS Annual Meeting, San Francisco, CA, March 26-30, 2000.
100. "Characterization of Indene Bioconversion in *Rhodococcus* Sp. Continuous Cultures Using Radioactive Tracers and Multichannel Flow Cytometry," ACS Annual Meeting, San Francisco, CA, March 26-30, 2000.
101. "Metabolic Flux Analysis and Characterization of Indene Bioconversion in *Rhodococcus* Sp.," ACS Annual Meeting, San Francisco, CA, March 26-30, 2000.
102. "Prediction of Antisense Oligonucleotide Binding Affinity," ACS Annual Meeting, San Francisco, CA, March 26-30, 2000.
103. "After a Decade of Progress, an Expanded Role for Metabolic Engineering," ACS Annual Meeting, San Diego, CA, April 1-5, 2001.
104. "Thermodynamics and Kinetics of Antisense Oligonucleotide Binding," AIChE Annual Meeting, Reno, NV, November 4-9, 2001.
105. "Reconstruction and Quantification of Signal Transduction Networks," AIChE Annual Meeting, Reno, NV, November 4-9, 2001.
106. "Genome Wide Screening for Trait Conferring Genes Using DNA micro-arrays," AIChE Annual Meeting, Reno, NV, November 4-9, 2001.
107. "Metabolic Engineering of Fine Chemical Synthesis: Directing Stereoselective Indene Oxidation in *Rhodococcus*," AIChE Annual Meeting, Reno, NV, November 4-9, 2001.
108. "Systems Biology: A New Mind Frame for Biological Research," AIChE Annual Meeting, Reno, NV, November 4-9, 2001.
109. "Metabolic Profiling of Injury Response Dynamics in the Perfused Liver," AIChE Annual Meeting, Reno, NV, November 4-9, 2001.

110. **"Measurement of Mass Isotopomer Fractions by GC-MS for High Resolution Metabolic Flux Quantification,"** AIChE Annual Meeting, Reno, NV, November 4-9, 2001.
111. **"Metabolic Profiling: Definition and Use in Physiological State Classification,"** AIChE Annual Meeting, Indianapolis, IN, November 4-8, 2002.
112. **"Application of DNA Microarrays in the Optimization of the Xylose Utilization Pathway in *Saccharomyces Cerevisiae*,"** AIChE Annual Meeting, Indianapolis, IN, November 4-8, 2002.
113. **"Activation Ratio Analysis of MAP Kinase Phosphorylation,"** AIChE Annual Meeting, Indianapolis, IN, November 4-8, 2002.
114. **"Discovery of Gene Regulatory Networks Through DNA Microarray Expression Analysis,"** AIChE Annual Meeting, Indianapolis, IN, November 4-8, 2002.
115. **"Bioinformatics and Metabolic Engineering II: Panel Discussion - The Scope and Future of Metabolic Engineering,"** AIChE Annual Meeting, Indianapolis, IN, November 4-8, 2002.
116. **Discussion on the "Future of Chemical Engineering Research II,"** Paper 152h, AIChE Annual Meeting, Austin, TX, November 7-12, 2004.
117. **"Exploiting Biological Complexity for Strain Improvement Through Systems Biology,"** Paper 8a, AIChE Annual Meeting, Austin, TX, November 7-12, 2004.
118. **"Applying the Art of Pattern Discovery to the Design of Novel Antimicrobial Peptides,"** Paper 527e, Alpha Chi Sigma Award Session, AIChE Annual Meeting, Austin, TX, November 7-12, 2004.
119. **"A New Approach to Flux Determination of Metabolic Pathways Based on the Combined Use of Multiple Isotopic Tracers,"** paper 490e (presented by M. Antoniewicz), AIChE Annual Meeting, Austin, TX, November 7-12, 2004.
120. **"Evolutionary Strategies for Optimizing Metabolic Pathways in *Escherichia coli*,"** Paper 480a (presented by Hal Alper), AIChE Annual Meeting, Austin, TX, November 7-12, 2004.
121. **"Genomic Investigations of Hepatic Insulin Resistance: Linking Transcriptional Profiles to Intracellular Measurements,"** Paper 10a (presented by M. Raab), AIChE Annual Meeting, Austin, TX, November 7-12, 2004.
122. **"Identification of metabolite biomarkers in prediction of ESRD mortality,"** Paper BCEC 104B (with L. Tong), 234th ACS National Meeting, Boston, August 19-23, 2007.
123. **"Exploiting phenotypic diversity through global transcription machinery engineering,"** Paper 107C (With D. Klein), 234th ACS National Meeting, Boston, August 19-23, 2007.
124. **"Developing high throughput screening methods for multiple phenotype evaluation,"** Paper BCEC 106B (with B. Wang), 234th ACS National Meeting, Boston, August 19-23, 2007.
125. **"Development of a melanin-based screen for tyrosine production in *Escherichia coli*,"** Paper BCEC 108 (with C. Santos), 234th ACS National Meeting, Boston, August 19-23, 2007.
126. **"Growth-phase accumulation of poly-3-hydroxybutyrate in *Escherichia coli*: A prospectus for continuous production,"** Paper BCEC 109A (with K. Tyo), 234th ACS National Meeting, Boston, August 19-23, 2007.
127. **"Isotopically nonstationary flux analysis using an elementary metabolite unit (EMU) framework,"** Paper BCEC 108 (with J. Walther), 234th ACS National Meeting, Boston, August 19-23, 2007.