EXHIBIT 5

CURRICULUM VITAE

GORDON L. AMIDON

PERSONAL:

Office Address

2012 College of Pharmacy
The University of Michigan
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Birth Date: April 27, 1944

EDUCATION

1967	B.S. Pharmacy, State University of New York at Buffalo, Buffalo, NY.
1970	M.A. Mathematics, The University of Michigan, Ann Arbor, MI.
1971	Ph.D. Pharmaceutical Chemistry, The University of Michigan, Ann Arbor, MI.

PROFESSIONAL APPOINTMENTS

1997 – present	Chairman, PORT Systems, LLC, Ann Arbor, MI
1996 (Apr-May)	Visiting Professor, ETH Zurich, Department of Pharmacy, Zurich, Switzerland
1994 - present	Charles R. Walgreen, Jr., Professor of Pharmacy, College of Pharmacy, The University of Michigan, Ann Arbor, MI.
1994 - present	Chairman and Chief Scientific Officer, TSRL, Inc., Ann Arbor, MI
1990 - 1991	Sabbatical Leave from The University of Michigan. Food and Drug Administration, Rockville, MD and University of California San Francisco, San Francisco, CA.
1986 - 1994	President, TSRL, Inc., Ann Arbor, MI
1983 - present	Professor of Pharmaceutics, College of Pharmacy, The University of Michigan, Ann Arbor, MI
1983 - 1986	Director of Research, SmithKline Consumer Products, Philadelphia, PA
1981 - 1983	Director, Pharmaceutical Chemistry Research, INTERx Research Corp., a subsidiary of Merck & Co., Inc., Lawrence, KS
1981 - 1983	Adjunct Professor of Pharmaceutics, University of Kansas, Department of Pharmaceutical Sciences, Lawrence, KS

1976 - 1981	Assoc. Professor, University of Wisconsin, School of Pharmacy, Madison, WI
1976 - 1980	Assist. Dean for Educational Planning and Policy, University of Wisconsin, Madison, WI
1974 (Summer)	Upjohn Summer Professor, The Upjohn Co., Kalamazoo, MI
1971 - 1976	Assist. Professor, University of Wisconsin, School of Pharmacy, Madison, WI
1967 (Summer)	Upjohn Summer Scholar, The Upjohn Co., Kalamazoo, MI

HONORARY DEGREE

2001 Doctor of Pharmacy, Uppsala University, Uppsala, Sweden

AWARDS

1975 - Ebert Prize, American Pharmaceutical Association, most outstanding paper representing original research to appear in the Journal of Pharmaceutical Sciences, 1974 (G.L. Amidon, S.H. Yalkowsky and S. Leung, Solubility of nonelectrolytes in polar solvents II: solubility of aliphatic alcohols in water, J. Pharm. Sci., 63, 3225 (1974).

1980 - Parenteral Drug Association Research Award (as faculty advisor to student of award-winning research paper).

1981 - Ebert Prize, American Pharmaceutical Association, Journal of Pharmaceutical Sciences, 1980 (G.L. Amidon, G.D. Leesman and R.L. Elliott, Improving intestinal absorption of water-insoluble compounds: a membrane metabolism strategy, J. Pharm. Sci., 69, 1363 (1980).

1984 - Ebert Prize, American Pharmaceutical Association, Journal of Pharmaceutical Sciences, 1983 (L. Van Campen, G.L. Amidon and G. Zografi, Moisture sorption kinetics for water-soluble substances I: theoretical considerations of heat transport control, J. Pharm. Sci., 72, 1381 (1983).

1996 - Scheele Award, Swedish Academy of Pharmaceutical Sciences, for outstanding contributions to the field of oral drug delivery and biopharmaceutics.

2003 - Controlled Release Society Founders' Award, acknowledges pioneering and long-standing innovative science and technological developments in the area of controlled release.

2004 - American Association of Colleges of Pharmacy Volwiler Research Achievement Award, in recognition of outstanding research achievement by an AACP pharmacy educator.

2004 - American Association of Pharmaceutical Scientists Meritorious Manuscript Award, D.Sun, H.Lennernas,L.S. Welage, J.L. Barnett, C.P. Landowski, D. Foster, D.Fleisher, K-D Lee and G.L. Amidon, Comparison of human duodenum and Caco2 gene expression profiles for 12,000 gene sequences tags and correlation with permeability of 26 drugs, Pharm.Res. , 19, 1400 (2002).

PROFESSIONAL ORGANIZATIONS

American Association of Pharmaceutical Scientists
American Pharmacists Association
American Association for the Advancement of Science
American Association of Colleges of Pharmacy
American Chemical Society
American Society for Biochemistry & Molecular Biology (ASBMB)
The Controlled Release Society
American Peptide Society
European Federation for Pharmaceutical Sciences (EUFEPS)
International Pharmaceutical Federation (FIP)

LISTED IN

Who's Who in Science
Who's Who in Frontiers of Science & Technology, 2nd Ed.
International Who's Who in Medicine, 1st Ed.

PROFESSIONAL ACTIVITIES

President, American Association of Pharmaceutical Scientists (1998).
Fellow, American Association of Pharmaceutical Scientists.
Elected Fellow, APhA/Academy of Pharmaceutical Sciences (1981).
Elected Fellow, American Association for the Advancement of Science (1985).
Member, Pharmacy Internship Board Ad Hoc Committee: Internship Program Review
Advisor to Pharmacy Examining Board on NABPLEX exam.
Advisor for NIH on BSRG site visit (West Virginia University, 1979).
Member, Planning Committee, Land-O-Lakes Conference (1972, 1974, 1978-80).
Chairman, Land-O-Lakes Conference (1982).
Co-Chairman, Land-O-Lakes Conference (1984).
Vice Chairman, Basic Pharmaceutics Section, Academy of Pharmaceutical Sciences (1981-82).
Chairman-Elect, Basic Pharmaceutics Section, Academy of Pharmaceutical Sciences (1983).
Chairman, Basic Pharmaceutics Section, Academy of Pharmaceutical Sciences (1984).
Chairman, Program Committee, Academy of Pharmaceutical Sciences (1982).
Member, NIH NCI Site Visit (1982, 1984).
Member, Ad Hoc Committee, NIH Pharmacology Study Section (1983, 1984).
Member, NIH Pharmacology Study Section (1984-1988).
Participant, Tulane University Site Visit (NIH Project, 1984).
Elected member, Electorate Nominating Committee, Section S, American Association for the Advancement of Science.
Member, AAPS Committee on Academic Excellence in Pharmaceutics
Chairman, Awards Committee, The Controlled Release Society (1987-90).

Elected member-at-large, Section S Committee, American Association for the Advancement of Science (1988).
Editorial Board, *International Journal of Pharmaceutics*
Editorial Board, *Journal of Pharmaceutical Sciences*
Editorial Board, *Pharmaceutical Research*
Editorial Board, *European Journal of Pharmaceutical Sciences*
Associate Editor, *Pharmaceutical Research* (1988-1994)
Publications Board, *PharmSci*
Reviewer, Scientific Journals
President, The Controlled Release Society (1993-94)
Member, Peer Review 1995, Leiden/Amsterdam Center for Drug Research (Jan 1995)
Elected Member, USP Committee of Revision (Standards) (1995-2000)
Member, European Federation for Pharmaceutical Sciences (EUFEPS)
Member, Drug Information Association
Member/Expert Consultant, Generic Drugs Advisory Committee, FDA
Member, Product Quality Research Initiative (PQRI) Steering Committee, FDA
Member, American Society for Clinical Pharmacology & Therapeutics
Member, American Society for Biochemistry & Molecular Biology (2003).
Editor, (ACS) Journal of Molecular Pharmaceutics (2003)
Guest Editor, Editorial Board, Biological and Pharmaceutical Bulletin (Journal of the Pharm. Assoc. of Japan) (Jan 2004-Dec 2006).
Member (invited), International Advisory Board of Indo-Japanese Conference on Advances in Pharmaceutical Research & Technology. (2005).

COMMITTEES The University of Michigan (past and present)

College Ombudsman (2003-04)
Member, Diversity Committee, College of Pharmacy
Member, Medicinal Chemistry Program Committee, Rackham Graduate School
Member, OVPR Advisory Council (OAC)
Past Member, Gene Therapy Group
Past Member, Vector Core Advisory Committee
Past Member, Research Associate Deans Group (OVPR)
Past Member, Human Applications Laboratory Group (HAL)
Past Chairman, Computer Resources Committee, College of Pharmacy
Past Member, Graduate Affairs, College of Pharmacy
Past Member, Research Resources, College of Pharmacy
Past Member, Faculty & Teaching Assistant Awards Committee (Rackham)

University of Wisconsin

Member, Curriculum Committee, School of Pharmacy
Chairman, Curriculum Committee, School of Pharmacy
Member, Center for Health Sciences Liason, School of Pharmacy
Member, Inpatient/Outpatient Clerkship, School of Pharmacy
Chairman, AACP Accreditation Self-Study Committee, School of Pharmacy
Member, Curriculum Study and Review, School of Pharmacy
Member, Clinical Search Committee, School of Pharmacy
Member, Engineering and Humanities symposium Faculty Advisory Committee, School of Pharmacy

RESEARCH SUPPORT

Dainippon Pharmaceutical Co., Ltd., Osaka, Japan; $20,000/yr (2003-2005).

NIH/NIGMS; Mucosal Cell transporters and Enzymes in Drug Delivery; $287,135 (DC Yr 1); 2004-2008, G.L. Amidon (PI).

HHS/FDA; Bioequivalence methods for GI locally acting drugs; $25,000 (2004-05).

NIH: Identification and utilization of prodrug targets for oral absorption and targeting to virally infected cells; $183,196 (DC Yr 1): 2005-2010; G.L. Amidon (Co-PI).

PATENTS

US #6,669,954, Issued Dec 30, 2003. Controlled release of drugs, John R. Crison and Gordon L. Amidon.

US #6,541,454, Issued April 1, 2003. Phosphonates, biphosphonates and pharmaceutical compositions containing them, Eli Breuer, Gershon Golomb, Gordon L. Amidon, Ivan Alferiev, Naama Rozen and Aviva Friedman-Ezra.

US #6,207,191, Issued March 27, 2001. Multi-Stage Delivery System, John R. Crison and Gordon L. Amidon.

US #6,153,592, Issued Nov. 28, 2000, Enhancing the Bioavailability of Proteolytically Labile Therapeutic Agents, Gordon L. Amidon, Glen D. Leesman and Patrick J. Sinko.

US #6,048,551, Issued April 11, 2000, Microsphere Encapsulation of Gene Transfer Vectors, John M. Hilfinger, Beverly L. Davidson, Steven J. Beer, John Crison and Gordon L. Amidon.

US #5,993,858, Issued Nov. 30, 1999, Method and Formulation for Increasing the Bioavailability of Poorly Water-Soluble Drugs, John R. Crison and Gordon L. Amidon.

US #5,9'76,571, Issued Nov. 2, 1999, Method for Making a Multi-Stage Drug Delivery System, John R. Crison and Gordon L. Amidon.

US #5,851,275, Issued Dec. 22, 1998, Water Soluble Pharmaceutical Coating and Method for Producing Coated Pharmaceuticals, Gordon L. Amidon and John R. Crison.

US #5,834,022, Issued Nov. 10, 1998, Water Soluble Pharmaceutical Coating and Method for making, Gordon L. Amidon and John R. Crison.

US #5,686,133, Issued Nov. 11, 1997, Water Soluble Pharmaceutical Coating and Method for Producing Coated Pharmaceuticals, Gordon L. Amidon and John R. Crison.

US #5,674,530, Issued Oct. 7, 1997, Method for Making a Multi-Stage Drug Delivery System, Gordon L. Amidon and John R. Crison.

US #5,569,452, Issued Oct. 29, 1996, Pharmaceutical Formulation Having Enhanced Bile Acid Binding Affinity, Gordon L. Amidon, Lizbeth B. Sherman, John R. Crison.

U.S. Patent #5,455,286, Issued October 1995; Bioactive Composition; Gordon L. Amidon, Ramachandran Chandrasekharan and Aruther Goldberg.

US #5,387,421, Issued Feb. 7, 1995, Multi Stage Drug Delivery System, Gordon L. Amidon, ,Glen D. Leesman and Lizbeth Sherman.

US #5,229,131, Issued Jul. 20, 1993, Pulsatile Drug Delivery System, Gordon L. Amidon and Glen D. Leesman.

US #5,221,698, Issued June 22, 1993, Bioactive Composition, Gordon L. Amidon, Ramachandran Chandrasekharan and Arthur Goldberg.

US #4,976,949, Issued Dec 11, 1990, Controlled release Dosage Form, James Meyer, Gordon L. Amidon and Jennifer B. Dressman.

U.S. Patent #4,685,918, Issued August 11, 1987; Lipid Osmotic Pump; Gordon L. Amidon, Takeru Higuchi and Jennifer B. Dressman.

TEACHING

University of Wisconsin (1971-1981)

Professional Program Courses

Pharmaceutics I: Introduction to the Physical and Chemical Properties of Drug and Drug Product

Introduced biochemical energetics and environmental impact of clorofloro hydrocarbons into the core thermodynamic and equilibrium curriculum.

Preservation and Stabilization of Pharmaceuticals: Chemical Stability

Introduced easy to calculate estimation procedures for shelf-life calculations as well as FDA regulatory standards for expiration dating of pharmaceuticals. This course lead to the publication of the book "The Chemical Stability of Pharmaceuticals: A Handbook for Pharmacists", now in it's second edition and still widely used by industrial and regulatory scientists through out the world. (K.A. Connors, G.L. Amidon and V.J. Stella, Eds., The Chemical Stability of Pharmaceuticals, 2nd Ed., John Wiley & Sons, Inc., NY (1986).

Graduate Courses

Modeling and Data Treatment: Linear and Nonlinear Regression Analysis

Introduced linear and nonlinear regression methods and developed time sharing programs focused on chemical kinetic and pharmacokinetic applications.

Sustained and Controlled Release

Taught diffusion and transport processes in matrix and reservoir, diffusional and osmotic oral controlled release systems. Introduced gastrointestinal processes influencing and controlling oral controlled release systems.

The Physical Chemistry of Solutions and Solubility Estimation

Introduced physical chemical estimation methods into the curriculum. Particular focus was on partition coefficient and solubility in aqueous and aqueous mixed co-solvent systems.

Theoretical Methods in Drug Research

Introduced the modern theoretical methods, quantum mechanical and non-bonded computational methods for analysis of enzyme-substrate and drug-receptor modeling.

The University of Michigan (1983-present)

Professional Program Courses

Pharmaceutics 332 - Introduction to Physical Pharmacy

Introduced food and dietary examples of energetics as well as biochemical energetics and environmental impact of clorofloro hydrocarbons, from aerosols into the core thermodynamic and equilibrium curriculum.

Pharmaceutics 333 - Physical Pharmacy of Solution Dosage Forms

Introduced solubility estimation and co-solvent selection in formulation of parenteral systems.

Pharmaceutics 434 - Physical Pharmacy and Biopharmaceutics II

Introduced principals of oral delivery including solubility-dissolution and permeability limited absorption, gastrointestinal physiology and nutrient processing and absorption mechanisms and carrier-mediated transport. Introduced FDA drug regulatory standards including the Biopharmaceutic Classification System (BCS) applicable to both NDA and ANDA (generic) drugs. Developed a computer based training (CBT) program for teaching fundamental biopharmaceutics concepts and methods of analysis.
("Modern Biopharmaceutics" Version 6: TSRL Inc., 2003, http://www.tsrlinc.com)

Pharmaceutics 435/560 – Pharmacokinetics and Biopharmaceutics

Taught the basic pharmacokinetics principles and ADME of drugs. Introduced mechanistic oral delivery system analysis into the course material in addition to the more common empirical system analysis.

Graduate Courses

750 - Principles of Drug Delivery

Taught principles of oral delivery and delivery systems, solubility-dissolution, permeability and mechanisms and methods of absorption and *in vivo* absorption analysis.

752 - Chemical Kinetics and Mechanism

Taught basic kinetic methods and application to expiration dating and FDA regulatory requirements for drug product stability. The second edition of the book The Chemical Stability of Pharmaceuticals: A Handbook for Pharmacists, (John Wiley & Sons, Inc., NY (1986)) is based on this course.

755 - Special Topics (with Medicinal Chemistry 635)

Taught an advanced course in peptide and peptidomimetic absorption and metabolism and prodrugs approaches to enhance delivery. A monograph based on this course has been published, Peptide-Based Drug Design: Controlling Transport and Metabolism, (M.D. Taylor and G.L. Amidon, Eds), American Chemical Society (1995)).

757 - Transport Phenomena in Pharmaceutical Systems

Teaches transport processes fundamental to pharmaceutical systems including, dissolution, permeability and absorption prediction and transport processes on controlled release systems. Now includes biological transport pathways and membrane transporters.

Two advanced monograph are based on this graduate level course:

Transport Processes in Pharmaceutical Systems, (G.L. Amidon, P.I. Lee and E.M. Topp, Eds.) Marcel Dekker, New York, NY (1999)) and

Membrane Transporters as Drug Targets, (G.L. Amidon and W. Sadee, Eds), Kluwer Academic/Plenum Publishers, New York (1999).

759 - Physicochemical Properties of Drugs

Taught methods of solubility and partition coefficient estimation and mixed solvent solubilities important in parenteral formulation.

Post-Graduate Teaching

Organized and teaches in the Strategies for Oral Drug Delivery Short Course. This course teaches the following concepts to industry and regulatory scientists.

- Understand the gastrointestinal, drug and dosage form processes controlling absorption.
- Understand the relevance and utility of *in vitro* tissue culture models to *in vivo* absorption.
- Understand and apply methods for estimating and evaluating oral drug absorption, including high throughput screening (HTS) methods and computer simulation and prediction methods.
- Evaluate and develop appropriate methods to optimize oral delivery.
- Be able to identify the potential rate limits to oral drug absorption.
- Understand intestinal and hepatic metabolic pathways and their impact on absorption and systemic availability.
- Identify appropriate types of controlled release dosage forms for specific drugs.
- Identify GI physiological variables influencing absorption rate and extent.
- List metabolism and transporter factors e.g., P-gp, influencing absorption and systemic availability.
- Have an understanding of molecular membrane transporters and their importance for h... absorption and excretion.
- Analyze and simulate pharmacokinetic absorption rate and plasma level.

- Understand the current FDA bioavailability (BA) and bioequivalence (BE) standards and how they may evolve in the future.

More than 1000 industrial and regulatory scientists have taken this yearly course over the past 15 years.

Strategies for Oral Drug Delivery, May 4-8, 1987, Ann Arbor, MI.

Strategies for Oral Drug Delivery, September 19-22, 1989, Ann Arbor, MI

Strategies for Oral Drug Delivery, August 24-August 29, 1992, Uppsala, Sweden

Strategies for Oral Drug Delivery, October 5-8, 1993, Ann Arbor, MI

Strategies for Oral Drug Delivery, August 28-September 2, 1994, Uppsala, Sweden

Strategies for Oral Drug Delivery, October 9-13, 1995, Ann Arbor, MI

Strategies for Oral Drug Delivery, May 6-10, 1996, Ascona, Switzerland

Strategies for Oral Drug Delivery, September 29-October 3, 1997, Baltimore, MD

Strategies for Oral Drug Delivery, August 23-28,1998, Uppsala, Sweden

Strategies for Oral Drug Delivery, March 6-10, 2000, Lake Tahoe, Nevada

Strategies for Oral Drug Delivery, March 11-16, 2001, Garmisch Partenkirchen, Germany

Strategies for Oral Drug Delivery, March 10-16, 2002, Lake Tahoe, Nevada

Strategies for Oral Drug Delivery, January 11-16, 2004, Vail, Colorado

Strategies for Oral Drug Delivery, January 9-13, 2005, Garmisch-Partenkirchen, Germany

Teaching Summary:

Professor Amidon's early teaching is noteworthy for introducing modern computational methods into the graduate curriculum in the early1970's. Computers and computational methods including nonlinear regression analysis, essential to pharmacokinetic analysis, linear regression and ANOVA for pharmaceutical stability, and quantum mechanical and molecular mechanics methods for estimating molecular properties such as surface areas and non-bonded interactions. While these tools are computer 'desktop' tools today, they were at the very earliest stage of development when Professor Amidon recognized the importance of these tools and introduced these methods and pharmaceutical applications into the graduate curriculum.

More recently, Professor Amidon's teaching has been noteworthy for introducing modern computational methods and computer based tools into both the professional and graduate program. He was one of the first pharmaceutical scientists to recognize the importance of computers in pharmaceutical research and training and introduced these tools into the graduate and professional courses he has taught. He has played a fundamental role in advancing FDA regulatory standards in the bioequivalence area and has introduced these fundamental new concepts into the curriculum. His professional program teaching blends the latest scientific knowledge with knowledge of FDA

regulatory standards and application to both NDA and ANDA drug products. He has continued to bring the latest computer based advances in teaching to the classroom with his development of a computer based training program for teaching biopharmaceutics ("Modern Biopharmaceutics" Version 6: TSRL Inc., 2003, http://www.tsrlinc.com)

Professor Amidon's graduate teaching, over the course of his career, has focused on the fundamental physical chemical and transport processes in pharmaceutical systems. His teaching has consistently evolved to include the most fundamentally important concepts and advanced methods in transport processes in pharmaceutical systems with a particular focus on biopharmaceutics and oral delivery. This includes most recently biological transport and the rapidly advancing field of membrane transporters. The quality, significance and commitment to teaching at the professional and graduate levels has resulted in the publication of five books based on Professor Amidon's teaching.

Professor Amidon has also been active in postgraduate teaching through organizing and teaching a course on Oral Drug Delivery on a yearly basis in the US and Europe. This course is widely regarded as the best post-graduate course in oral delivery taught today. Over 1000 scientists have been trained in this week long intensive course covering modern strategies of oral delivery and modern methods in biopharmaceutics.

Finally, Professor Amidon's mentoring of graduate, postdoctoral and research fellows has been truly exceptional. He has trained 53 graduate students and 48 postdoctoral and research fellows. He has had 14 graduate students and 12 postdoctoral and research fellows choose academic careers in the US, Canada, Europe and Asia. Over 300 abstracts have been presented by his students at national meetings.

In summary, Professor Amidon's teaching and mentoring of pharmacists and pharmaceutical scientists has had an enormous impact on the pharamceutical sciences world-wide.

Visiting Professor Lecture(s)/Training Courses

University of Iowa: Physiology of the GI tract and dosage form performance, December 1984 (undergraduate lecture), Iowa City, IA.

University of Iowa: Dissolution plus enzymatic reaction: theoretical analysis and prodrug Implications, December 1984 (graduate lecture), Iowa City, IA.

University of Toronto, MRC Visiting Professor: (1) Predicting drug absorption in man: a transport analysis based on a macroscopic mass balance approach; (2) Carrier-mediated drug absorption: transport analysis and bioavailability implications; (3) Innovation in drug product efficacy: pharmaceutics in the next millennium, February 1990, Toronto, Canada.

FDA/Center for Drug Evaluation and Research, NONMEM: program structure and examples, March 1991, Rockville, MD.

FDA Short Course: Oral drug delivery and bioavailability. Gastrointestinal physiology and biochemistry; Gastrointestinal motility and transit; Biopharmaceutics and drug absorption (series of three lectures), April-May 1991, Rockville, MD.

Nagoya City University, Visiting Professor, October 23-November 3 1992, Nagoya, Japan.

Merck Sharp & Dohme Research Labs., Lecture Series: Theoretical considerations and *in vitro* and *in vivo* correlations for estimating human bioavailability; Transport mechanisms in the gastrointestinal tract and implications for oral drug absorption; Prodrug and analog approaches to improving oral drug absorption, January 18-19, 1993, Rahway, NJ and West Point, PA.

The University of Tennessee, College of Pharmacy, 1994 Kenneth E. Avis Distinguished Visiting Professor; International drug regulation and harmonization: biopharmaceutics moves to center stage (public seminar); Peptide transport and metabolism in the gastrointestinal tract (scientific seminar), January 17-19, 1994, Memphis, TN.

University of Houston, Visiting Professor in Pharmaceutics, Oral delivery of peptide type drugs; Oral absorption of insoluble drugs, May 1-3, 1994, Houston, TX.

State University of New York at Buffalo, graduate course lecture, Drug absorption models; seminar, A Biopharmaceutic Drug Classification scheme: implications for drug discovery and drug development, April 20-21, 1995, Buffalo, NY.

ETH Department of Pharmacy Lectures: Predicting oral drug absorption in humans: advances in drug discovery, development and regulation (Apr 23 1996); Mass transport and drug absorption (Apr 24 1996); GI physiology and transit (Apr 25 1996); Dissolution and absorption (Apr 30 1996); Oral peptide delivery (May 2 1996); GI physiology and drug absorption (May 21 1996); Drug regulation (May 23 1996), Zurich, Switzerland.

FDA Staff College Course on Biopharmaceutics, The rationale for a Biopharmaceutic Classification System, Sept 23-25, 1996, Rockville, MD.

INSERM Training Course "From Peptides to Peptidomimetics: Methods and Potential Applications in Therapy", Biodisposition and targeting of peptides, May 6-7, 1998, Le Vesinet, France.

Georgetown University CDDS Course, Predictive value of animal models for oral bioavailability in humans, May 12-15, 1998, McLean, VA.

CDDS/Lilly Drug Development Course, Predictive value of preclinical ADME, Aug 31-Sept 1, 1998, The Westin Indy Hotel, Indianapolis, IN.

Georgetown University Drug Delivery Course, Predictive value of pre-clinical ADME, June 6-8, 1999, Georgetown University, Washington, DC.

BCS Guidance Training/FDA, The BCS: examples and future developments, June 18-19, 2000, Washington, DC.

AAPS Dietary Supplements Forum Exploring the Science of Nutraceuticals, Oral delivery of dietary supplements: mechanistic and therapeutic considerations, June 28-30, 2000, Washington, DC.

Modern Biopharmaceutics Pharmacokinetics Course, GlaxoSmithKline Pharmaceutical Development, May 22-23, 2001, Upper Marion, PA.

Modern Biopharmaceutics Pharmacokinetics Course, GlaxoSmithKline Pharmaceutical Development, July 31-Aug 1, 2001, Harlow, Essex, United Kingdom.

Novapharm Ltd., Modern Biopharmaceutics Training Course, Oct 21-22, 2002, Toronto, Canada.

Federacion Farmaceutica Sudamericana (FEFAS), Stability Course--Chemical and Pharmaceutical Stability (Co-Chair/Lecturer) *Lecture titles*: Historical background, definitions of pharmaceutical stability, chemical stability vs kinetics; Solution Kinetics: Order of the reaction; zero-order reaction; first-order reaction; first-order reactions w/more than one end product; Parallel Reactions; consecutive reactions; second order reactions; pseudo first-order reactions; Temperature effects: transition state, collision theory; Arrhenius plot; activation energy calculations; using of activation energies; Q10 value calculations approximate method; Q10 value calculations exact method; Models for accelerated stability testing; Factorial and other experimental designs; Drug FDA guidelines for stability testing, April 1-4, 2003, Santiago, Chili.

Chilean Public Health Institute, Drug Delivery Foundation, Chilean Industrial Chemical-Pharmacists Society and Chilean Pharmaceutical Sciences Academy, International Biopharmacy Course 1 (Organizing Committee & Lecturer), *Lecture titles*: Wagner Nelson Method; Dissolution Processes; Gastrointestinal Transit; Dissolution Theory; *In vivo* Dissolution and Absorption; Predicting Absorption; BCS and *in vitro* BE; Predicting Absorption, August 11-14 2003, Santiago, Chile.

Workshops

Land-O-Lakes Workshop: Strategies for using drug metabolism: the oral route, June 1979, Lake Dalton, WI.

Land-O-Lakes Workshop: Formulation and process optimization: experimental design, June 1980, Lake Dalton, WI.

Pharmaceutical Manufacturers Assoc. Drug Metabolism Subsection Workshop: Influence of food and diet on food-drug interactions affecting drug absorption, March 1987, Bethesda, MD.

Food and Drug Administration, Predicting oral drug absorption in man, June 1988, Rockville, MD.

AAPS, FDA, USP Jointly Sponsored Workshop, Optimum information to characterize drug entity: biological considerations--animal models, December 1988, Washington, DC.

AAPS, FDA, USP Jointly Sponsored Workshop, Panel Chairman for Section on: Optimum information to characterize the dosage form, December 1988, Washington, DC.

Biomedical Simulations Resources Workshop; Predicting oral drug absorption in humans: a macroscopic mass balance approach for passive and carrier-mediated compounds, May 1990, Los Angeles, CA.

FDA Center for Drug Evaluation and Research Workshop; Predicting drug absorption in humans: bioavailability and statistical considerations, October 1990, Rockville, MD.

SmithKline Beecham Workshop on Peptide/Protein Drug Delivery, Transport and metabolism of peptides in the gastrointestinal tract, October 1991, Philadelphia, PA.

AAPS Workshop--Scale-up of Oral Solid Dosage Forms; Dissolution, December 1991, Arlington, VA.

University of Athens, New Developments in Biopharmaceutics-Pharmacokinetics Workshop; Oral delivery of peptides--review: possibilities, progress, May 1992, Athens, Greece.

FDA/AAPS Workshop on Scale-up of Oral Extended Release Dosage Forms (co-chair), September 1992, Arlington, VA.

Workshop on Transdermal Drug Delivery System, Skin permeation and metabolism of drugs with emphasis on peptides. Regulatory and safety aspects of TTS in the USA, May 6, 1993, Irbid, Jordan.

Biomedical Simulations Research Workshop, Simulation and analysis of the drug absorption processes: scientific and regulatory needs, May 21-22, 1993, Los Angeles, CA.

NIGMS Pharmacology and Biorelated Chemistry Program; Workshop on Oral Drug Delivery: Interface Between Discovery and Development; Drug transport and transit in the gastrointestinal tract: factors controlling oral bioavailability, December 5-7, 1993, Herndon, VA.

IBM and the University of Lund, Computational Chemistry and Molecular Modeling in Pharmaceutical Research Workshop; Structure transport analysis of the intestinal peptide transporter: data base and theoretical approaches. March 14-16, 1994, Lund, Sweden.

Food & Drug Administration, The biopharmaceutics drug classification scheme: extensions for controlled release products, June 13, 1995, Rockville, MD.

Sandoz Workshop--Penetration studies in support of drug discovery and early development. Modeling drug absorption from the gastrointestinal tract: influence of permeability, solubility and transit, Jun 2-4, 1996, Hagenthal, France.

CRS Baltimore Conference and Workshops, Co-chair, Technology, design and evaluation of oral controlled release dosage forms, August 21-22, 1996, Baltimore, MD.

AAPS/FDA/CRS Workshop on Scientific Foundation and Applications for the BCS and *In vitro In vivo* Correlations; Co-chair, speaker; Solubility, intrinsic dissolution and solubilization: influence on absorption, Apr 14-16, 1997, Alexandria, VA.

Regulatory Affairs Workshop (Ministry of Health and University of Buenos Aires); The rationale for a Biopharmaceutics Classification System for drug product regulation, May 15, 1997, Buenos Aires, Argentina.

Controlled Release Society Workshop, The Biopharmaceutics Classification System (BCS), June 15-17, 1997, Stockholm, Sweden.

Biopharmaceutics Classification System and *In Vitro In Vivo* Correlations Workshop, Solubility as a limiting factor to drug absorption, February 23-25, 1998, Sponsored by APV/AAPS/CRS/EUFEPS/FDA, Frankfurt, Germany.

AAPS Workshop on Permeability Definitions & Regulatory Standards for Bioequivalence (co-chair), Current views regarding permeability measurements for regulatory standards, August 17, 1998, Arlington, VA.

Indian Pharmaceutical Association/International Regulatory Affairs Workshop. Biopharamceutics Classification System: scientific perspectives, December 9, 1998, Mumbai, India.

Modeling and Simulation Workshop, Biopharmaceutics simulation and prediction of bioavailability, February 4-5 1999, Washington, DC.

Novartis Pharmaceuticals Corp., Workshop on Pharmacokinetics and Drug Metabolism, Biopharmaceutics and pharmacokinetics: what's important for candidate selection and drug development (Lect 1), Biopharmaceutics and oral drug absorption: from prediction to regulation (Lect 2), Oct 17-18, 1999, Summit, NJ.

AAPS/PAHO Workshop, The Biopharmaceutics Classification System, November 5, 1999,. Washington, DC.

AAPS/Federacion Farmaceutica Centroamericana y del Caribe (FFCC) Workshop, New bioequivalence regulations for drug products based on in vitro standards, November 28, 1999, Managua, Nicaragua.

Egyptian Pharmacists Day and Workshop, Biopharmaceutics Classification System—scientific perspectives, February 9-11, 2000, Cairo, Egypt.

ICRS/FIP-BPS/AAPS Workshop, Physiological considerations in the design of oral MR products, February 14-15, 2000, Judean Hills, Israel.

UFRGS College of Pharmacy Workshop, Oral drug absorption: from mechanism to regulatory standards, Aug 3, 2000, Porto Alegre, Brazil

AAPS Biopharmaceutics in the New Millennium Workshop, BCS-Scientific Principles, Sept 11, 2000; Why dissolution alone may not be completely predictive of BE, Sept 12, 2000, Washington, DC.

BCS: FDA Guidance and Implementation Workshop, Academic Perspective, September 25, 2000, Arlington, VA

FIP/Academy of Pharmaceutical Sciences Great Britain International Workshop on the Biopharmaceutic Classification System, Absorption of drugs from IR and MR dosage forms—a mechanistic approach for BCS, Oct 8, 2001, London, England.

Accelerating Drug Development: Biorelevent Dissolution and Impact of New BABE Guidances-Dissolution Workshop, BCS: A basis for extending BE dissolution standards: class II and class III drugs; BCS extensions report of discussion group, Jan 31-Feb 1, 2002, Princeton, NJ.

FIP/AAPS Bioavailability and Bioequivalence-Latin America Scientific and Regulatory Issues Workshop; Biopharmaceutics classification system: challenges and opportunities, Apr 25-May 1, 2002, Santiago, Chile.

AAPS/USP Workshop, Keynote Address, Bioequivalence Classification System: scientific basis and extension for immediate release products, May 7-8, 2001, Arlington, VA.

AAPS/FDA Workshop, BCS: A basis for etending BE dissolution standards, Sept 25-27, 2002, Arlington, VA.

Novartis Workshop, Genomics, proteomics and prodrugs, Sept 30-Oct 3, 2002, Bad Waltersdorf, Austria.

BA/BE Workshop, BCS—Concepts and appication for biowaiver, Nov 20-21, 2002, Quito, Ecuador.

Federation Internationale Pharmaceutique (FIP)/ World Health Organization (WHO)/Pharmaceutical Association of Thailand/Mahidol University, Dissolution Technology and Bioequivalence Workshop: Biopharmaceutics Classification System: Concepts and Application for Biowaivers, Mar 10-11, 2003, Bangkok, Thailand.

Federation Internationale Pharmaceutique (FIP)/ World Health Organization (WHO), Hands-on-Dissolution and Bioequivalence Workshop; Biopharmaceutics Classification System: Concepts and Application for Biowaivers, Mar 12-18 2003, HoChiMinh City, Vietnam.

Symposium

University of Utah: Second International Symposium on Recent Advances in Drug Delivery Systems; Targeting of prodrugs for hydrolysis by GI tract enzymes, February 1985, Salt Lake City, UT.

Twelfth International Symposium of Controlled Release of Bioactive Materials: Swelling and drug release from p-HEMA-MAA hydrogel system, July 1985, Geneva, Switzerland.

APhA/APS Basic Pharmaceutics Section Symposium: Physiological flow modeling of the gastrointestinal tract and its use in oral dosage form design and evaluation, October 1985, Minneapolis, MN.

Third International Symposium on Recent Advances in Drug Delivery Systems: Carrier- mediated transport of small peptides and peptide analogs, February 1987, Salt Lake City, UT.

AB Hassle, Informal Symposium on Absorption: Physical modeling and predictability of drug absorption in the gastrointestinal tract: correlation between *in vitro* and *in vivo* results, September 1987, Molndal, Sweden.

Eastern Regional Group of AAPS, First Regional Symposium: Design of biopharmaceutical properties for drug absorption through prodrugs and analogs, September 1987, Atlantic City, NJ.

Drug Metabolism Discussion Group Symposium, Ortho Pharmaceutical Corp., Predicting oral drug absorption in man, June 1988, Ft. Washington, PA.

Second International Symposium on Disposition and Delivery of Peptide Drugs, FIP Satellite Symposium, Oral absorption of peptide type drugs: carrier-mediated transport of small peptides, September 1989, Leiden, The Netherlands.

First European Symposium on Controlled Drug Delivery, March 1990, Leidschendam, The Netherlands.

Johnson & Johnson Annual Symposium on Drug Delivery Technology; Intestinal mucosal cell transport of peptide and peptide-type drugs, October 1990, New Brunswick, NJ.

AAPS/FDA Symposium on Biopharmaceutics and Clinical Pharmacology of Nonsystemically Available Gastrointestinal Drugs; Biopharmaceutics, pharmacokinetics and pharmacodynamics of drugs that are active in the gastrointestinal tract, 4th Annual AAPS meeting, November 1990, Las Vegas, NV.

Capsugel Symposium, Oral Delivery of Peptides--from Theory to Practice; The role of formulation, chemical modification and drug metabolism in the oral absorption of peptides, Sept 1991, New Brunswick, NJ.

ACCP 20th Annual Meeting Symposium, Drug isomer plasma level from oral controlled release dosage forms: propranolol isomer ratio levels in dogs, October 1991, Atlanta, GA.

AAPS Sixth Annual Meeting, Symposium: Predicting oral drug absorption in humans; macroscopic and microscopic mass balance approaches, November 1991, Washington, DC.

Johnson & Johnson Focused Giving Scientific Symposium, Transport and metabolism of peptides in the gastrointestinal tract, December 1991 New Brunswick, NJ.

Kanazawa University Symposium, Intestinal absorption of peptide-type drugs, June 1992, Kanazawa, Japan.

ACS Symposium, Prodrug approaches for improving oral delivery: a novel use of the intestinal epithelial cell peptide transporter, August 1992.

Sixth International Symposium on Recent Advances in Drug Delivery Systems, Panel Moderator; February 21-25, 1993, Salt Lake City, UT.

Keystone Symposium, Intestinal epithelial cell peptide transport: structure transport and improving oral peptide delivery, March 8-12, 1993, Taos, New Mexico.

Zeneca Pharmaceuticals Group,Keynote Speech at Symposium on Technologies--Present & Emerging; Increasing the efficiency of developing effective drug products: discovery and development closing the loop, November 10, 1993, Wilmington, DE.

Bio-International '94 Symposium, *In vivo* validation of *in vitro* dissolution test and specification: application to immediate release to oral dosage forms, June 14, 1994, Munich, Germany.

Capsugel Board of Advisors, A theoretical basis for a drug biopharmaceutics drug classification and international drug regulation," December 6, 1994, Tokyo, Japan.

Seventh International Symposium on Recent Advances in Drug Delivery Systems; Transmembrane transport of peptide type compounds, February 27, 1995, Salt Lake City, Utah.

Capsugel Seminar and Open Forum on Biopharmaceutical Drug Classification and International Drug Regulation; The rationale for a biopharmaceutics drug classification, Proceedings Booklet, Capsugel Library, May 17, 1995, Princeton, NJ.

Fourteenth American Peptide Symposium, Oral delivery of peptide-type compounds, June 18-23, 1995, Columbus, OH.

Wyeth-Ayerst Research Symposium 1995, Drug design and screening from the viewpoint of optimizing oral drug bioavailability, August 17, 1995, Plattsburg, NY.

FIP Satellite Symposium on Optimizing Therapy Using Controlled Release Products, Swedish Academy of Pharmaceutical Sciences, Modeling drug absorption from the gastrointestinal tract as a tool for design of controlled release products; Biopharmaceutical aspects of gastrointestinal drugs, experience with resin therapy for cholesterol lowering, August 25-26, 1995, Stockholm, Sweden.

CRS Ireland Symposium, Current topics in peptide delivery; Overview, Peptide delivery in the year 2000, September 20-22, 1995, Dublin, Ireland.

German Chemical Society, Drug Targeting Symposium; Oral drug delivery of peptide-type drugs: present status and future prospects, February 9, 1996, Frankfurt, Germany.

AACP Academic Management Symposium, Experience with the NIH/SBIR program: how to be successful in the process and how to survive if you are funded, March 4, 1996, Costa Mesa, CA.

Capsugel Open Panel Discussion of the Biopharmaceutic Drug Classification Scheme, May 14, 1996, Geneva, Switzerland.

CRS Mini-Symposia, Hormonal and Autocoid Disorders, co-organizer, 23rd International Symposium on Controlled Release of Bioactive Materials, July 7-10, 1996, Kyoto, Japan.

24th Symposium of the European Peptide Society, Oral peptide and peptidiomimetic delivery: present status and future prospects, Sept 8-13, 1996, Edinburgh, Scotland.

Pre-Symposium, Keynote Address, Drug absorption from the GI tract and design of oral controlled release products, B.V. Patel Pharmaceutical Education & Research Development (PERD) Centre, Feb 5, 1997, Ahmedabad, India.

3rd International Symposium on Innovations in Pharmaceutical Sciences and Technology; Plenary Lecture, Exploiting transport mechanisms in the GI tract for improved oral peptide and protein delivery, Feb 8, 1997, Ahmedabad, India.

Korean Society of Applied Pharmacology 1997 Symposium; Biopharmaceutic properties of drugs: new tools to facilitate drug discovery and development, Apr 18, 1997, Seoul, Korea.

Pharmacokinetic Symposium in Honor of Dr. Leslie Benet; Advances in drug development: concepts based on drug delivery, May 17, 1997, San Francisco, CA.

Gattefosse Symposium, Predicting absorption of water insoluble compounds and other "difficult" molecules: strategies for enhancement of absorption, including the use of lipidic systems, June 3-7, 1997, St. Remy, France.

Capsugel Symposium, The rationale for a Biopharmaceutics Drug Classification system, July 15, 1997, Tokyo, Japan.

Alfred Benzon Symposium, Oral administration of peptide and protein drugs, Aug 17-21, 1997, Copenhagen, Denmark.

Lilly Alternative Drug Delivery Symposium, Delivery of proteins via injectable depot and oral routes, April 23-24, 1998, Indianapolis, IN.

Gattefosse Symposium, Optimizing drug delivery: overview (also conference chairman), June 4-6, 1998, St. Remy, France.

Wyeth-Ayerst Scientific Symposium, Predicting human drug absorption: implications for drug discovery, drug development and drug regulation, November 17,1998, Pearl River, NJ.

2nd AAPS Frontier Symposium, Session Co-chair; Designing drugs for hPEPT1 transport, April 8-10 1999, Bethesda, MD.

International Symposium: Strategies for Optimizing Oral Drug Delivery: Scientific to Regulatory Approaches; Introduction and Overview, Closing Remarks, Apr 19-21, 1999, Kobe, Japan.

Capsugel Symposium, Oral controlled release and pharmacodynamic optimization: future needs and prospects, April 23, 1999, Tokyo, Japan.

Powrex Pharmaceutical Symposium, Modern BA/BE and dissolution requirements: new scientific approaches to international regulatory standards, July 4-7, 1999, Osaka, Japan.

The New Pharmaceutical Engineering Program Symposium, Pharmaceutical science and regulatory policy, September 17-18, 1999, Ann Arbor, MI.

Annual Congress of the Asociacion Farmaceutica Mexicana (AFM) Symposium, The biopharmaceutics classification system, Oct 24-27, 1999, Puerto Vallarta, Mexico.

AAPS Symposium on Predicting Oral Absorption of Drugs (AAPS National Meeting), Predicting absorption: discovery to regulation, November 15-19, 1999, New Orleans, LA

AAPS Symposium on IVIVC Update and Its Role in Setting Dissolution (AAPS National Meeting), Predicting absorption along the GI tract: implication for design and regulation of MR dosage forms, November 15-19, 1999, New Orleans, LA.

International Symposium--Role of Transporters in Drug Disposition, Transporters and molecular mechanisms of small intestinal drug absorption, January 18-19, 1999, Tokyo, Japan.

University of Michigan, 10th International Cyclodextrin Symposium, May 21-24, 2000, Ann Arbor, MI

International Symposium on Scientific and Regulatory Issues for Pharmaceutical Markets, The Biopharmaceutics Classification System: scientific basis and extensions for immediate release products, Nov 28, 2000, Bangkok, Thailand.

International Symposium on Scientific and Regulatory Issues for Pharmaceutical Markets,The Biopharmaceutics Classification System and its application and extensions to immediate release products, Dec 2, 2000, Taipei, Taiwan.

International Symposium on Scientific and Regulatory Issues for the International Pharmaceutical Market, The Biopharmaceutics Classification System and its application and extensions to immediate release products; Extensions of BCS for immediate release and modified release products, Dec 5-6, 2000, Seoul, Korea.

60th Anniversary Symposium, Seoul Pharmaceutical Society, Modern molecular biopharmaceutics: from genes to absorption, Keynote Speaker, May 11, 2001, Seoul, Korea.

Capsugel PK/PD Symposium, Co-Chair; Oral candidate selection for optimized oral delivery, Dec 12, 2002, Basal, Switzerland.

Faculdade de Farmacia da Universidade de Lisboa, International Symposium--The New European Note for Guidance on Bioavailability and Bioequivalence (Co-Chair) – Lecturer, The role of the Biopharmaceutics Classification System in regulatory requirements of bioequivalence; Session Moderator, Challenges to Harmonization, Apr 12-13, 2003, Lisbon, Portugal.

INVITED PRESENTATIONS

The Upjohn Company: Theoretical calculation of heats of complexation in solution, November 1971, Kalamazoo, MI.

University of Wisconsin (Milwaukee), Chemistry Department: Theoretical calculation of heats of complexation in solution, May 1972, Milwaukee, WI.

Pharmaceutics Seminar, University of Wisconsin: Onium ion interactions with hypothetical receptor features, Madison, WI.

University of Wisconsin, School of Pharmacy: Theoretical calculations on a model system for charge-relay effects in the serine hydrolase enzymes, March 1973, Madison, WI.

The Upjohn Company: The Means by which enzymes catalyze reactions, June 1974, Kalamazoo, MI.

The Upjohn Company: Aqueous solubilities of monofunctional aliphatic compounds, August 1974, Kalamazoo, MI.

University of Wisconsin, School of Pharmacy: Molecular surface area as a parameter in solubility prediction, Madison, WI.

The University of Michigan, College of Pharmacy: Molecular surface areas as a parameter in solubility prediction, October 1974, Ann Arbor, MI.

The Ohio State University, College of Pharmacy: Molecular surface area as a parameter in aqueous solubility estimation, November 1975, Columbus, OH.

The Upjohn Company: A free energy partitioning analysis of the hydrophobic effect, August 1976, Kalamazoo, MI.

The University of Iowa, College of Pharmacy: The binding of inhibitors to α-chymotrypsin, October 1976, Iowa City, IA.

The University of Iowa, College of Pharmacy: Expiration dating, October 1976, Iowa City, IA.

University of Wisconsin, Parkside, Biology Department: Substrate and inhibitor binding to enzymes: the role of the solvent, February 1978, Kenosha, WI.

Lawrence University, Biology Department: How enzymes catalyze reactions, February 1978, Appleton, WI.

University of Texas, College of Pharmacy and Drug Dynamics Institute: Drug receptor interactions; the solvent contribution, July 1978, Austin, TX.

University of Texas, College of Pharmacy and Drug Dynamics Institute: Drug design: a pharmaceutical perspective, July 1978, Austin, TX.

The University of Michigan, College of Pharmacy, Pharmaceutics Alumni Seminar: Drug absorption through membrane metabolism, September 1978, Ann Arbor, MI.

Ohio State University, College of Pharmacy and the Ohio Pharmaceutical Society: Information management and future issues: educational needs, April 1979, Columbus, OH.

Arner-Stone Pharmaceutical Company: A biochemical approach to drug absorption, April 1979, Chicago, IL.

University of Utah, College of Pharmacy: Drug absorption through membrane metabolism, May 1979, Salt Lake City, UT.

Northern California Pharmaceutical Association and Syntex, Inc.: New approaches to improving absorption of water insoluble compounds, May 1979, Palo Alto, CA.

ALZA, Corp.: A biochemical approach to drug absorption, May 1979, Palo Alto, CA.

Merck Sharp and Dohme, Research Labs: A biochemical approach to drug absorption, August 1979, West Point, PA.

The University of Wisconsin, School of Pharmacy: A biochemical approach to drug absorption, September 1979, Madison, WI.

Lawrence University, Biology Department: The biochemistry of absorption: pharmaceutical applications, November 1979, Appleton, WI.

Eli Lilly and Co., Research Labs: Strategies for solubilizing drug: A biochemical approach, January 1980, Indianapolis, IN.

W.H. Rorer and Company, Product development section: stable aspirin amino acid derivatives, January 1980, Fort Washington, PA.

W.H. Rorer and Company, Product Development Section: The physiochemical and biochemical basis for solubilization, January 1980, Fort Washington, PA.

Riker Division of 3M: Improving intestinal absorption of water insoluble drugs, April 1980, St. Paul, MN.

DuPont Research: A biochemical approach to drug absorption, August 1980, Wilmington, DE.

The University of Michigan, College of Pharmacy, Pharmaceutics Alumni Seminar: Intestinal absorption, October 1980, Ann Arbor, MI.

E.R. Squibb Pharmaceutical Co.: A biochemical approach to drug absorption, November 1980, New Brunswick, NJ.

University of Texas: Improving intestinal absorption of drugs, November 1980, Austin, TX.

University of Illinois: A biochemical approach to improving intestinal absorption, November 1980, Chicago, IL.

University of Buffalo: A membrane metabolism approach to drug absorption, June 1981, Buffalo, NY.

INTERx Research Corp.: A biochemical approach to drug absorption, July 1981, Lawrence, KS.

Eli Lilly Co. Research Labs.: Water uptake by soluble salts: a heat transport controlled process, September 1981, Indianapolis, IN.

The Univ. of Connecticut, Arthur E. Schwarting Pharmacy Practice Symposium: prodrugs; design and application, April 1983, Storrs, CT.

Philadelphia Discussion Group, Oral Absorption: Soluble prodrugs of hydrocortisone, February 1984, Philadelphia, PA.

T. Higuchi Research Seminar, Oral absorption of water soluble hydrocortisone prodrugs, March 1984, Lake Ozarks, MO.

University of California, San Francisco: Diffusion and enzymatic reaction: theoretical analysis and prodrug implications, April 1985, San Francisco, CA.

The Upjohn Co., Compaign for Michigan: Oral absorption and drug delivery systems, April 1985, Ann Arbor, MI.

Pfizer Research Seminar: Oral absorption of peptides, May 1986, Groton, CT.

The University of Michigan, College of Pharmacy Steering Committee Meeting: Oral absorption of peptides and related compounds, September 1985, Ann Arbor, MI.

University of Cincinnati: *In vivo* performance of enteric coated dosage forms, November 1986, Cincinnati, OH.

Procter & Gamble: Oral peptide delivery; small peptide absorption, November 1986, Cincinnati, OH.

University of Toronto: Oral absorption of peptides: passive vs carrier-mediated transport, December 1986, Toronto, Canada.

The University of Michigan, College of Pharmacy, Interdepartmental Program in Medicinal Chemistry: Oral delivery of peptides; prospects and limitations, January 1987, Ann Arbor, Michigan.

Syntex Research, Institute of Pharmaceutical Sciences: Oral absorption of passive and carrier-mediated compounds: application to peptide analog absorption, April 1987, Palo Alto, CA.

The University of Michigan, Chemical Engineering Department: Transport phenomena in pharmaceutical Systems, April 1987, Ann Arbor, MI.

The University of Michigan, Pediatric Cardiology Department: Dose and dose-rate effects on the oral delivery of first-pass metabolized drugs, April 1987, Ann Arbor, MI.

The Squibb Institute for Medical Research: Oral absorption of passive and carrier-mediated compounds: application to peptide analog absorption, April 1987, New Brunswick, NJ.

West Virginia University Graduate Research Association of Students in Pharmaceutics: Innovation in drug product efficacy: a new role for pharmaceutics, June 1987, Morgantown, W. VA.

Abbott Laboratories: Oral delivery of peptides and peptide analogs, July 1987, N. Chicago, IL.

CIBA-GEIGY Corporation: Design of biopharmaceutical properties for drug absorption through prodrugs and analogs, March 1988, Summit, NJ.

Hudson Valley Discussion Group: Predicting drug absorption in man, March 1988, New Brunswick, NJ.

IInd International ISSX Meeting: Design of prodrugs for oral drug delivery, May 1988, Kobe, Japan.

Sankyo Company, Oral absorption of captopril, May 1988, Tokyo, Japan.

Hoshi University, Oral delivery of peptide drugs, May 1988, Tokyo, Japan.

Kyoto University Hospital, Oral delivery of peptide drugs, May 1988, Kyoto, Japan.

Hokuriku Branch of the Pharmaceutical Society of Japan, Oral delivery of peptide drugs, May 1988, Kanazawa, Japan.

Nagoya City University, Oral delivery of peptide drugs, May 1988, Nagoya, Japan.

Kanebo Company, Oral delivery of peptitic drugs, May 1988, Osaka, Japan.

Kobe-Gakuin University, Oral delivery of peptitic drugs, May 1988, Kobe, Japan.

Takeda Company, Oral delivery of peptide drugs, May 1988, Osaka, Japan.

AAPS Joint Eastern Regional Meeting, Use of enzymes and carriers in the gastrointestinal tract for improving drug absorption, June 1988, Atlantic City, NJ.

Fourth Japanese-American Conference on Pharmacokinetics and Biopharmaceutics, Phase related variation and fasted state gastric emptying rates: implications for oral drug pharmacokinetics, July 1988, San Francisco, CA.

Sandoz Ltd., Oral delivery of peptide drugs, August 1988, Basle, Switzerland.

Controlled Release Society, Macroscopic mass balance approach for predicting fraction dose absorbed in humans, August 1988, Basel, Switzerland.

KRUG International,Technology Life Sciences Div., Johnston Space Center, Workshop on Pharmacokinetics-Pharmacodynamics, August 1988, Houston, TX.

Drug Absorption in microgravity. Pharmacokinetics and Pharmacodynamics in Space, Report of a Workshop, NASA Conference Publication 10048 (Aug 1988), Lunar and Planetary Institute, Houston, TX.

Pfizer Central Research, Carrier-mediated transport of small peptide type drugs, September 1988, Sandwich, Kent, England.

Third International Conference on Drug Absorption, Absorption of difficult drug molecules; carrier-mediated transport of peptides and peptide analogs, September 1988, Edinburgh, Scotland.

Royal College, University of Strathclyde, Oral absorption of peptide type drugs, October 1988, Glasgow, Scotland.

University of Geneva, Oral delivery of peptitic drugs, October 1988, Geneva, Switzerland.

Universite de Lausanne, Importance of solubility in drug absorption, October 1988, Lausanne, Switzerland.

Squibb Institute for Medical Research, Carrier-mediated absorption of ACE inhibitors, December 1988, New Brunswick, NJ.