CURRICULUM VITAE

Dhiren R. Thakker

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EDUCATION:

Ph.D. (Biochemistry) University of Kansas, Lawrence, KS, 1975
M.S. (Pharmaceutical Chem.) Columbia University, NY, 1972
B.S. (Pharmacy) Bombay University, Bombay, India, 1970

PROFESSIONAL EXPERIENCE:

2018 – Current
John A. and Margaret P. McNeill, Sr. Distinguished Professor

2017 – current
Interim Dean, UNC Eshelman School of Pharmacy
Interim Director, Eshelman Institute for Innovation

1996 - current
Howard Q Ferguson Distinguished Professor of Pharmaceutical Sciences (1996-2018)
Division of Pharmacotherapy and Experimental Therapeutics (since 2009)
Division of Molecular Pharmaceutics (formerly Division of Drug Delivery and Disposition) (1996-2009)
UNC Eshelman School of Pharmacy (formerly School of Pharmacy)
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599

2008 – 2016
Associate Dean, Entrepreneurial Development and Global Engagement (EDGE)
(Previously referred as Economic Development and International Partnerships)
UNC Eshelman School of Pharmacy

2015 – current
Director, Bill and Karen Campbell Faculty Mentoring Program
UNC Eshelman School of Pharmacy

1998 - 2008
Associate Dean, Research and Graduate Education
School of Pharmacy (now UNC Eshelman School of Pharmacy)

1996 - 2005
Joint appointment: Pharmacology
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599

1995 - 1996
Visiting Professor
Pharmaceutics Division, School of Pharmacy
University of North Carolina at Chapel Hill,
Chapel Hill, NC 27599

1992 - 1995
Director, Drug Metabolism Department, Glaxo Research Institute,
Research Triangle Park, NC 27709

1990 - 1992
Department Head, Drug Metabolism Department, Glaxo Research Institute,
Research Triangle Park, NC 27709

1987 - 1990
Section Head, Bioorganic Mechanisms Section, Drug Metabolism Department,
Glaxo Inc., Research Triangle Park, NC 27709

1993 - 1996
Adjunct Professor, Department of Pharmacology, School of Medicine,
University of North Carolina, Chapel Hill, NC 27514

1990 - 1996
Adjunct Professor, Department of Medicinal Chemistry,
School of Pharmacy, University of North Carolina,
Chapel Hill, NC 27514

1984 - 1987
Senior Investigator, Laboratory of Molecular Pharmacology, Division of Biochemistry and Biophysics, Center for Drugs and Biologics, Food and Drug Administration, Bethesda, MD 20892.

1978 - 1984
Senior Staff Fellow/Research Chemist, Laboratory of Bioorganic Chemistry, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, National Institutes of Health.

1976 - 1978
Staff Fellow, Laboratory of Chemistry, National Institute of Arthritis, Metabolism, and Digestive Diseases, National Institutes of Health.

1975 - 1976
Visiting Fellow, Laboratory of Chemistry, National Institute of Arthritis, Metabolism and Digestive Diseases, National Institutes of Health.

MANAGEMENT EXPERIENCE:

1. **Serves (or has served) on Boards and Scientific Advisory Boards of several Biotech Companies**
2. **Led and Managed the Preclinical Drug Metabolism Department at Glaxo**

- The department consisted of a staff of 36 including 19 Senior Scientists with Ph.D. or equivalent experience.
- The annual operating budget was $6 million, and the capital budget was approximately $1.5 million.
- The primary responsibility of the department was to conduct non-clinical metabolism, pharmacokinetic and toxicokinetic studies in support of development candidates, and to participate in the discovery and selection of new drug candidates to achieve optimum metabolic and pharmacokinetic profiles.
- The department also had the responsibility to synthesize radioisotope-labeled compounds for the Research and Development Divisions.

3. **As a member of the Technical Development Team (management team), participated in the coordination of exploratory development programs**

- The Technical Development Team had representation from Toxicology, Drug Metabolism, Pharmaceutics, Analytical Chemistry, Process Chemistry, Clinical Pharmacology, Regulatory Affairs, and Project Planning.
- The Technical Development Team participated in the formulation of strategies for exploratory development (preclinical through phase I/phase II) of drug candidates and was responsible for the implementation of these strategies.

4. **Interacted with the FDA on the non-clinical ADME issues**

5. **As a member of the Research Management Committees, participated in the management of Discovery Programs in Cancer, Metabolic Diseases, and Inflammation**

PROFESSIONAL EXPERIENCE

Editorial Board, J. Pharm. Sci. (1997-current)

Editorial Board, Medicinal Research Reviews (2000 – current).

UNC Global Advisory Council, UNC Global (2016-)

Chancellor's UNC Global Taskforce (2016-)

Advisory Board, Office of Technology Development, UNC-Chapel Hill

Co-Editor-in-Chief, Medicinal Research Reviews (2003-2006)

Advisory Board, Office of Business and Economic Development, UNC-Chapel Hill

Advisory Board, Carolina Student Biotechnology Network, UNC, Chapel Hill

International Affairs Advisory Council, UNC Global Education Center, UNC, Chapel Hill

IntraHealth Advisory Council, IntraHealth International, Durham, NC

National University of Singapore Department of Pharmacy Visiting Committee (external review committee) 2009

Chair, National University of Singapore Department of Pharmacy Visiting Committee (external review committee) 2014

Editorial Board, Current Drug Metabolism, 1999-2002.

Editorial Board, Drug Metabolism and Disposition, 1994-1997

Board of Directors and Scientific Advisory Board, Qualyst Inc.

Board of Directors, Chesson Labs (current)

Board of Directors, Tergus Pharma (current)

Co-founder and Chair of Scientific Advisory Board, Sphaera Pharma (current)

Drug Development Advisory Board, Scios Inc. (subsidiary of J & J)

Science and Technology Advisory Board, Oread Inc.

Scientific Advisory Board, Navicyte

Awards Committee, Society for Biomolecular Screening (SBS)

AAPS Taskforce on Drug Discovery Interface

Chair, Drug Metabolism Focus Group, AAPS

Founding Member of the Steering Committee, RTP Drug Metabolism Discussion Group, 1999-2002

Member of the External Review Committee
Graduate Program, School of Pharmacy, University of Washington, Seattle

Basic Pharmacology Advisory Committee
Pharmaceutical Manufacturers' Association Foundation

Special Emphasis Panel, National Institute of General Medical Sciences, NIH

Organizer - Short Course on "Designing Safe Drugs - Integration of Disposition Studies in Drug Discovery and Development", Residential School on Medicinal Chemistry, Drew University

Organizer and Chair– Short Course on "Prodrug Design – Enhanced and Targeted Delivery of Therapeutic Agents" at the 7th North American ISSX Meeting, October 1996, Sand Diego, CA.

Chair - Special Symposium on *"Drug Delivery and Prodrug Technologies"* at the 31st ACS Western Regional Meeting held in October 1995

Chair - Session on *"Integration of Preclinical ADME Studies in the Preclinical and Clinical Safety Assessment"* at the annual meeting of the Drug Information Association, 1994

Chair - Session on *"Delivery and Disposition of Peptides and Oligonucleotides-Current Status and Future Challenges"* at the annual meeting of the International Society for the Study of Xenobiotics held in October 1994

Special reviewer for Geriatric Review Committee, Institute on Aging

Reviewer for Investigational New Drug (IND) applications primarily dealing with Interferons and Monoclonal antibodies

Reviewer for several leading journals including Nature, Cancer Research, Journal of American Chemical Society, Molecular Pharmacology, Carcinogenesis, Chemico-Biological Interactions, Analytical Biochemistry, Toxicology and Applied Pharmacology, and Chemical Research in Toxicology, Drug Metabolism and Disposition, Pharmaceutical Research, Journal of Pharmaceutical Sciences, Journal of Experimental Therapeutics.

Served as a consultant to Amgen, Amylin Pharmaceuticals, BASF Bioscience, Du Pont Pharmaceuticals, Glaxo Wellcome, ICAgen, Intercardia, Parke Davis, Proctor & Gamble, Synaptics, Triangle Pharmaceuticals, Trimeris, Wyeth, Pozen, Ontogen, Chiron, Scios, Medivation, Arete, Virobay, Sanofi-Aventis, USVP venture partners

Served as an Expert Witness for several law firms representing pharmaceutical companies in patent litigation

External Examiner, Ph.D. Examination, Uppsala University, Sweden.

External Examiner, Ph.D. Examination for Huadong Sun, University of Toronto,

Toronto, Ontario, Canada

External Examine, Ph.D. Examination, Nirma University, Gujarat, India

Organizer, Symposium on ADME in Drug Discovery at the Institute of Chemical Technology, Mumbai, India, 2012

HONORS AND AWARDS:

INVENTOR OF THE YEAR AWARD – The University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, 2015

DISTINGUISHED ALUMNUS AWARD - Academic, UDCT Alumni Association and Chemical Institute of Technology, Mumbai, India, 2014

FELLOW, American Association of Pharmaceutical Scientists

SATO MEMORIAL INTERNATIONAL AWARD presented by the Pharmaceutical Society of Japan in 1987.

PHILLIP NEWMARK AWARD for "Excellence in Biochemical Research" at the University of Kansas in 1974.

DISSERTATION FELLOWSHIP at the University of Kansas in 1975.

GRADUATE HONORS FELLOW at the University of Kansas.

Placed SECOND in Bombay University at the B. Pharm. degree examination.

RESEARCH:

(1) Mechanisms of drug transport across intestinal epithelium

(2) Novel intestinal absorption mechanism and pharmacology of the antidiabetic drug metformin

(3) Anticancer effects of metformin

(4) Regulation and modulation of tight junctions in biological barriers

(5) Pediatric drug disposition

(6) Stereoselectivity of cytochrome P450 isoenzymes (past interest)

(7) Metabolic activation of xenobiotics to mutagens and carcinogens (past interest)

Ph.D.

(1) Development of specific irreversible inhibitors of the enzyme, COMT, which

play an important role in the metabolism of epinephrine, norepinephrine, dopamine, as well as several catecholic endogenous compounds and xenobiotics.

(2) Study of relationship between physico-chemical properties of 8-hydroxyquinolines and their COMT inhibitory activity (Hansch approach).

(3) Affinity chromatography of COMT.

(4) Chemical modification of functional groups on COMT active-site.

M.S.

Synthesis of imidazole derivatives as potential chymotryptic agents.

FUNDING: Over $4 million in research funding from federal and state agencies as well as from pharmaceutical and biotech companies

Current Funding (2016):

RSG CCE 128826 01/01/2016 – 12/31/2019
American Cancer Society (Contact PI: Bae-Jump, V.) Annual Direct: $164,963
Role: Co-Investigator
Obesity, Cation-Selective Transporters and Metformin in Endometrial Cancer
We will evaluate the contribution of a representative metformin transporter to the anti-tumor efficacy of metformin in obese and non-obese orthotopic mouse models, in which tumors are derived from an endometrial cancer cell line with normal or overexpression of a representative transporter. In addition, we will correlate treatment response to metformin in EC patients with (i) expression and genetic variants of the metformin transporters, (ii) modulation of the AMPK-mTOR pathway, and (iii) metabolic factors associated with obesity.

PhRMA Foundation (PI – Dhiren Thakker; Predoctoral Fellowship for Christine Lee) Annual Direct: $20,000, Role: Advisor to Christine Lee 01/01/2017 – 06/30/2018
Use of Human Intestinal Tissue and PBPK Modeling to Predict the Pharmacokinetics of Orally Administered Amoxicillin in Adults and Infants

STUDENTS AND FELLOWS:

Graduate Students:

1. Kiho Lee (MCNP) - Ph.D., May 2000
2. Hui Ouyang (MCNP) – Ph.D., Dec 2001
3. Peter Ward (Pharmcology) – Ph.D., May 2001
4. Matt Troutman (DDD) – Ph.D., July 2001
5. Gururaj Rao (DDD) – Ph.D., May 2003
6. Chee Ng (DDD) - (Chair, Dissertation Committee and co-advisor), Ph.D., May 2003
7. Seongwong Hong (MCNP) –Ph.D., May 2004
8. David Bourdet (DDD)- Ph.D., August, 2005
9. Stephanie Faucette (Molecular Pharmaceutics) co-advisor – Ph.D., May 2006
10. Richard Graham (Molecular Pharmaceutics) co-advisor – Ph.D., May 2006

11. Tim Tippin (Molecular Pharmaceutics), Ph.D., Dec 2006
12. Beverly Mowrey (Molecular Pharmaceutics), Ph.D. Aug 2007
13. Ryan Klein (Molecular Pharmaceutics), Ph.D. Dec 2007
14. Xin Ming (Molecular Pharmaceutics), Ph.D. Aug 2008
15. Will Proctor (Molecular Pharmaceutics) Ph.D. May 2010
16. Claudia Generaux (Molecular Pharmaceutics) co-adivisor Ph.D. August, 2010
17. Matthew Dufek (Molecular Pharmaceutics) Ph.D. May 2011
18. Souzan Yanni (Katholic U. Leuven, Belgium) Ph.D., June 2010
19. Chester Costales (Molecular Pharmaceutics) Ph.D., May 2013
20. Kevin Han (Molecular Pharmaceutics) Ph.D., May 2013
21. Yunhui Zhang (Ji Lin University, Peoples' Republic of China), Ph.D., 2013
22. Nicole Zane (Pharmacotherapy & Exp. Therapeutics), Ph.D., May 2015
23. Hao Cai (Pharmacotherapy & Exp Therapeutics), Ph.D., May 2016
24. Christine Lee (Pharmacotherapy & Exp Therapeutics), 4th year
25. Lawrence Ku (Pharmacotherapy & Exp Therapeutics), 4th year

Postdoctoral Fellows:

1. Dr. Aruljothi Muralidharan (2017-)
2. Dr. Arti Thakkar (2013-2015)
3. Dr. Ravindra Varma Alluri (2011 - 2013)
4 Dr. Wujian Ju (2009 – 2010)
5. Dr. Yan Gao (2006- 2008)
6. Darkhan Utepbergenov (2005-2007)
7. Dr. Lorraine King (2001-1002)
8. Dr. Johne Ansede (2001-2003)
9. Dr. Dongzhou Liu (1996-1998)
10. Dr. Shailesh Desai (1996-1999)
11. Dr. Cuiping Chen (1997-1998)
12. Dr. Sonia Serron (1997-1998)
13. Dr. Pieter Annaert (1998-1999)
14. Dr. Ashwin Patel (1998-2000)

Research Assistant Professor:

1. Dr. Ruth Everett (2010 -)
2. Dr. Steven Qian (2004-2005)

Visiting Scholars:

1. Dr. Yufeng Xia (2013-2014)
2. Dr. Ruth Everett (2008-2009)
3. Souzan Yanni (2008-2010)
4. Dr. Harish Padh, Vice Chancellor, Sardar Patel University (June – September 2006)
5. Dr. Innocent Ononiwu (2012-2014)

DISSERTATION COMMITTEES:

1. Cuiping Chen, DDD (Ph.D. 1997)
2. Catherine Booth, DDD (Ph.D. 1997)
3. Xinrong Liu, DDD (Ph.D. 1998)
4. Mark Bush, DDD (Ph.D. 1999)
5. Kay Rittenhaus, DDD (Ph.D. 1999)

6. James Whisnant, DDD (M.S. 1999)
7. Mark Summerville, DDD (Ph.D. 2000)
8. Jennifer(Quin) Dong, DDD (Ph.D. 2000)
9. Claude Degenais, DDD (Ph.D. 2001)
10 Preethi Krishnan, MCNP (Ph.D. 2001)
11. Christopher Lowden, MCNP (Ph.D. 2001)
12. Jessica Smith, DDD (Ph.D., 2001)
13. Jian Zong, DDD (Ph.D., 2002)
14. Ryan Turncliff, DDD (Ph.D. 2004)
15. Chris Matheny, DDD (Ph.D. 2003)
16. Lian Zhou, MCNP (Ph.D., 2002)
17. Carolyne Cyne (Pharmacology - Ph.D. committee)
18. Peter Sazani, Pharmacology (Ph.D., 2002)
19. Craig Lee, Exp. Therapeutics (Chair) (Ph.D., 2006)
20. Scott Barrow, Toxicology Curriculum (Ph.D., 2004)
21. Enzo Palma, Molecular Pharmaceutics (Ph.D. 2006)
22. Dongmei Liu, Molecular Pharmaceutics (Chair) (Ph.D. 2007)
23. Jian Jiang, Curriculum in Applied and Material Sciences (Ph.D. 2007)
24. Xihong Xu, Chemistry, Duke University (Ph.D. 2008)
25. Brandon Swift, Experimental Therapeutics (Ph.D. 2009)
26. Melanie Joy, MCNP (Ph.D. 2009)
27. David Szabo, Toxicology Curriculum (Ph.D. 2011)
28. Michael Cohen-Wolkowiez Experimental Therapeutics (Ph.D. 2012)
29. Christina Won Experimental Therapeutics (Ph.D. 2012)
30. Nathan Pfeifer, Experimental Therapeutics (Ph.D. 2013)
31. Katsuhiko Sueda, Molecular Pharmaceutics (Ph.D. 2014)
32. Brandon Gufford, Experimental Therapeutics (SAC Committee)
33. Kyunghee Yang, Experimental Therapeutics (Ph.D. 2014)
34. Brian Ferslew, Experimental Therapeutics (Ph.D. 2014)
35. James Huckle, Molecular Pharmaceutics (Ph.D. 2014)
36. Jing Fu, Molecular Pharmaceutics (Ph.D. 2016)
37. Kevin Watt, Experimental Therapeutics (Ph.D. 2016)
38. Jason Slizgi, Experimental Therapeutics, (Ph.D. Committee)

PUBLICATIONS: Co-author of over 160 publications which include papers in the peer reviewed journals, review articles and book chapters (List Attached), co-editors of 2 books, and co-inventor on 7 patents (issued and pending).

AFFILIATIONS:
(1) American Chemical Society (ACS)
(2) American Association for Advancement of Science (AAAS)
(3) American Society of Pharmacology and Experimental Therapeutics (ASPET)
(4) American Association for Cancer Research (AACR)
(5) American Association of Pharmaceutical Scientists (AAPS)
(6) International Society for the Study of Xenobiotics (ISSX)
(7) Indian Association for Cancer Research

PUBLICATIONS

1. Borchardt, R.T. and Thakker, D.: Affinity Labeling of Catechol-O-Methyltransferase with N-Iodoacetyl-3,5-dimethoxy-4-hydroxyphenylethylamine. Biochem. Biophys. Res. Commun., 54: 1233-1239, 1973.

2. Borchardt, R.T. and Thakker, D.R.: Catechol-O-methyltransferase. 6. Affinity Labeling with N-Iodoacetyl-3,5-dimethoxy-4-hydroxyphenylalkylamines. J. Med. Chem., 18: 152-158, 1975.

3. Borchardt, R.T. and Thakker, D.R.: Affinity Labeling of Catechol-O-methyltransferase by N-Halonacetyl Derivatives of 3,5-Dimethoxy-4-hydroxyphenylethylamine and 3,4-Dimethoxy-5-hydroxyphylethylamine. Kinetics of Inactivation. Biochemistry, 14: 4543-4551, 1975.

4. Borchardt, R.T., Cheng, C.G. and Thakker, D.R.: Purification of Catechol-O-methyltransferase. 8. Structure-Activity Relationships for Inhibition by 8-Hydroxyquinolines. J. Med. Chem., 63: 69-77, 1975.

5. Bochardt, R.T., Thakker, D.R., Warner, V.D., Mirth, D.B. and Sane, J.M.: Catechol-O-methyltransferase. 8.Structure-Activity Relationships for Inhibition by 8-Hythyltransferase. J. Med. Chem., 19: 558-560, 1976.

6. Brochardt, R.T. Reid, J. R., Thakker, D.R., Liang, Y.O., Wightman, R.W. and Adams, R.N.: Catechol-O-methyltransferase. 9. Mechanisms of Inactivation by 6-Hydroxydopamine. J. Med. Chem., 19: 1201-1209, 1976.

7. Borchardt, R.T. and Thakker, D.R.: Evidence for Sulfhydryl Groups at the Active Site of Catechol-O-methyltransferase. Biochim. Biophys. Acta, 445: 598-609, 1976.

8. Borchardt, R.T. and Thakker, D.R.: Affinity Labeling of Catechol-O-Methyltransferase using N-Haloacetyl Derivatives of 3,5-Dimethoxy-4-hydroxyphenylethylamine and 3,4-Dimethoxy-5-hydroxyphenylethylamine. In Jacoby, W.B. and Wilchek, M. (Ed.): Methods in Enzymology - Affinity Labeling. New York, Academic Press, 1977, Vol. 46, pp. 554-561.

9. Lu, A.Y.H., Levin, W., Vore, M. Conney, A.H., Thakker, D.R., Holder, G. and Jerina, D.M.: Metabolism of Benzo[a]pyrene by Purified Liver Microsomal Cytochrome P-448 and Epoxide Hydrase. In Freudenthal, R.I. and Jones, P.W. (Ed.): Polynuclear Aromatic Hydrocarbons: Chemistry, Metabolism, and Carcinogenesis. New York, Raven Press, 1976, Vol. 1, pp. 115-126.

10. Thakker, D.R., Yagi, H., Lu, A.Y.H., Levin, W., Conney, A.H. and Jerina, D.M.: Metabolism of Benzo[a]pyrene IV. Conversion of (+)-Trans-7,8-dihydroxy-7,8-dihydrobenzo[a]pyrene to the Highly Mutagenic 7,8-Diol-9,10-epoxides, Proc. Natl. Acad. Sci. USA, 73: 3381-3385, 1976.

11. Thakker, D.R., Yagi, H., Akagi, H., Koreeda, M., Lu, A.Y.H., Levin, W., Wood, A. W., Conney, A.M.: Metabolism of Benzo[a]pyrene VI. Stereoselective Metabolism of Benzo[a]pyrene and Benzo[a]pyrene 7,8-Dihydrodiol to Diol Epoxides. Chem.-Biol. Interact., 16: 281-300, 1977.

12. Thakker, D.R., Yagi, H., Levin, W., Lu, A.Y.H., Conney, A.H. and Jerina, D.M.: Stereospecificity of Microsomal and Purified Epoxide Hydrase from Rat Liver: Hydration of Arene Oxides of Polycyclic Hydrocarbons. J. Biol. Chem., 252: 6328-6334, 1977.

13. Yagi, H., Thakker, D.R. Hernandex, O., Koreeda, M. and Jerina, D.M.: Synthesis and Reactions of the Highly Mutagenic 7,8-Diol-9,10-epoxides of the Carcinogen Benzo[a]pyrene. J. Am. Chem. Soc., 99: 1604-1611, 1977.

14. Yagi, H., Thakker, D.R., Mah, H.D., Koreeda, M. and Jerina, D.M.: Absolute Stereochemistry of the Highly Mutagenic 7,8-Diol-9,10-epoxides Derived from the Potent Carcinogen trans-7,8-Dihyroxy-7,8-dihydrobenzo[a]pyrene. J. Am. Chem. Soc., 99: 2358-2359, 1977.

15. Whalen, D.L. Montemarano, J.A., Thakker, D.R., Yagi, H. and Jerina, D.M.: Changes of Mechanism and Product Distributions in the Hydrolysis of benzo[a]pyrene 7,8-Diol-9,10-epoxide metabolites Induced by Changes in pH. J. Am. Chem. Soc., 99: 5522-5524, 1977.

16. Wood, A.W., Chang, R.L., Levin, W., Yagi, H. Thakker, D.R., Jerina, D.M., and Conney, A.H.: Differences in Mutagenicity of the Optical Enantiomers of the Diastereomeric Benzo[a]pyrene 7,8-Diol-9,10-epoxides. Biochem. Biophys. Res. Commun., 77: 1389-1396, 1977.

17. Wood, A.W., Levin, W., Ryan, D., Thomas, P.E., Yagi, H., Mah, H.D., Thakker, D.R., Jerina, D.M., and Conney, A.H.: High Mutagenicity of Metabolically Activated Chrysene 1,2-Dihydrodiol: Evidence for Bay Region Activation of chrysene. Biochem. Biophys. Res. Commun., 78: 847-854. 1977.

18. Levin, W., Wood, A.W., Lu, A.Y.H., Ryan, D., West, S., Thakker, D.R., Yagi, H., Jerina, D.M., and Conney, A.H.: Role of Purified Cytochrome P-448 and Epoxide Hydrase in the Activation and Detoxification of Benzo[a]pyrene. In Jerina, D.M. (Ed.): Drug Metabolism Concepts. Washington, D.C., American Chemical Society, 1977, ACS Symposium Series 44, pp. 99-126.

19. Jerina, D.M. Lehr, R., Shaefer-Ridder, M., Yagi, H., Karle, J.M., Thakker, D.R., Wood, A.W., Lu, A.Y.H., Ryan, D., West, S., Levin, W., and Conney, A.H.: Bay Region Epoxides of Dihydrodiols: A Concept which Explains the

Mutagenic and Carcinogenic Activity of Benzo[a]pyrene and Benzo[a]amthraceme. In Hiatt, H., Watson, J.D. and Winsten, I. (Ed.): Origins of Human Cancer. New York, Cold Spring Harbor Laboratories, 1977, PP. 639-658

20. Levin, W., Lu, A.Y.H., Ryan, D., Wood, A.W., Kapitulnik, J., West, S.,Huang, M.T., Thakker, D.R., Holder, G., Yagi, H., Jerina, D.M. and Conney, A.H.: Properties of the Liver Microsomal Monooxygenase System and Epoxide Hydrase: Factors Influencing the Metabolism and Mutagenicity of Benzo[a]pyrene. In Hiatt, H., Watson, J.D., and Winsten, I. (Ed.): Origins of Human Cancer. New York, Cold Spring Harbor, Cold Spring Harbor Laboratories, 1977, pp.659-682.

21. Bresnick, E., Stoming, T.A., Vaught, J.B., Thakker, D.R., and Jerina, D.M.: Nuclear Metabolism of Benzo[a]pyrene and of (+)-trans-7,8-Dihydroxy-7,8-dihydrobenzo[a]pyrene. Comparative Chromatographic Analysis of Alkylated DNA. Arch. Biochem. Biophys., 183: 31-37, 1978.

22. Lehr, R.E., Yagi, H., Thakker, D.R., Levin, W., Wood, A.W., Conney, A.H. and Jerina, D.M.: The Bay Region Theory of Polycyclic Aromatic Hydrocarbon Induced Carcinogenicity. In Freudenthal, R.I. and Jones, P.W. (Ed.): Polynuclear Aromatic Hydrocarbons: Chemistry, Metabolism and Carcinogenesis. New York, Raven Press, Vol. 2., pp.231-241.

23. Thakker, D.R., Levin, W., Stoming, T.A., Conney, A.H., and Jerina, D.M.: Metabolism of 3-Methylcholanthrene by Rat Liver Microsomes and a Highly Purified Monooxygenase System With and Without Epoxide Hydrase. In Freudenthal, R.I., and Jones, P.W.(Ed.): Polynuclear Aromatic Hydrocarbons: Chemistry, Metabolism and Carcinogenesis. New York, Raven Press, 1978, Vol. 2., pp.253-264.

24. Thakker, D.R., Yagi, H., and Jerina, D.M.: Analysis of Polycyclic Aromatic Hydrocarbons and Their Metabolites by High Pressure Liquid Chromatography. In Packer, L. and Fleischer, S. (Ed.): Methods in Enzymology: Biomembranes. New York, Academic Press, 1978, Vol. 51 (part C), pp. 279-296.

25. Thakker, D.R., Levin, W., Wood, A.W., Conney, A.H., Stoming, T.A., and Jerina, D.M.: Metabolic Formation of 1,9,10-Trihydroxy-9,10-dihydro-3-methylcholanthrene: A Potential Proximate Carcinogen from 3-Methylcholanthrene. J. Am. Chem. Soc., 100: 654-647, 1978.

26. Thakker, D.R., Yagi, H., Lehr, R.E., Levin, W., Lu, A.Y.H., Change, R.L., Wood, A.W., Conney, A.H., and Jerina, D.M.: Metabolism of trans-9,10-Dihydroxy-9,10-dihydrobenzo[a]pyrene Occurs Primarily by Arylhydroxylation Rather than Formation of a Diol Epoxide. Mol. Pharmacol., 14: 502-513, 1978.

27. Levin, W., Thakker, D.R., Wood, A.W., Chang, R.L., Lehr, R.E., Jerina, D.M. and Conney, A.H.: Evidence that Benzo[a]anthracene 3,4-Diol-1,2-epoxide is an Ultimate Carcinogen on Mouse Skin. Cancer Res., 38: 1705-1710, 1978.

28. Jerina, D.M., Yagi, H., Thakker, D.R., Karle, J.M., Mah, H.D., Boyd, D.R., Gadaginamath, G., Wood, A.W., Beuning, M., Chang, R.L. Levin, W., and Conney, A.H.: Stereoselective Metabolic Activation of Polycyclic Aromatic Hydrocarbons. In Cohen, Y. (Ed.): Advances in Pharmacology and Therapeutics, Vol. 9, Toxicology. New York, Pergamon Press, 1978, pp. 53-62.

29. Jerina, D.M. Yagi, H., Lehr, R.E., Thakker, D.R., Schaefer-Ridder, M., Karle, J.M., Levin, W., Wood, A.W., Change, R.L., and Conney, A.H.: The bay-Region Theory of Carcinogenesis by Polycyclic Aromatic Hydrocarbons. In Gelboin, H.V. and Ts'o P.O.P. (Ed.): Polycyclic Hydrocarbons and Cancer: Chemistry, Molecular Biology, and Environment. New York, Academic Press, 1978, pp. 173-188.

30. Jerina, D.M., Thakker, D.R., Yagi, H., Levin, W. Wood, A.W., and Conney, A.H.: Carcinogenicity of Benzo[a]pyrene Derivatives: The Bay-Region Theory. In Pure and Applied Chemistry. Vol. 50, Oxford, England, Pergamon Press, 1978, pp. 1033-1044.

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126. Costales C.L., Proctor W.R, Dufek M.B., Everett R.S, Thakker D.R. Apically Localized Mouse Intestinal Cation-selective Transporters Play a Role in the Oral Absorption and Pharmacology of Metformin. Globalization of Pharmaceutics Education Network: Eighth Meeting, Chapel Hill, NC, November 2010.

127. Dufek M.B., Bridges A, Zhao L, Knight BM, Thakker DR. P-glycoprotein (P-gp) Enhances Intestinal Bioavailability of Loperamide in Mouse by Reducing First-pass Intestinal Metabolism. AAPS, New Orleans, LA. November 2010.

128. Dufek M.B., Zhao L, Thakker DR. The Effect of P-glycoprotein (P-gp) on Metabolism of Loperamide in Human and Mouse Intestinal Epithelium. AAPS, New Orleans, LA. November 2010.

129. Dufek M.B., Bridges, A, Zhao L, Knight B, Thakker DR. P-glycoprotein (P-gp) Enhances the Portal Bioavailability of Loperamide in Mouse by Reducing First-pass Intestinal Metabolism. Global Pharmaceutical Education Network (GPEN) Biannual Conference, Chapel Hill, NC. November 2010.

130. Dufek M.B., Knight BM, Bridges AS, Overby DW, Farrel TM and Thakker DR. Can P-glycoprotein (P-gp) Increase Oral Bioavailability of Dual P-gp and Cytochrome P450 3A (CYP3A) Substrates in Human? AAPS Workshop on Drug Transporters in ADME: From the Bench to the Bedside. Bethesda, MD. March 2011.

131. Costales C.L., Proctor W.R., Dufek M.B., Everett R.S., Overby D, Farrell T, Thakker D.R. Metformin Absorption is mediated by Apical Cation-selective Transporters in Mouse and Human Intestinal Tissue. AAPS Workshop on Drug Transporters in ADME: From the Bench to the Bedside, Bethesda, MD, March 2011.

132. Everett, R., Han, T., Proctor, W.R., Ng, C., Costales, C., and Thakker D.R. The Apical Localization of the Organic Cation Transporter 1 (OCT1) in the Caco-2 cell Monolayer. AAPS Workshop on Drug Transporters, Bethesda, MD, March 2011.

133. Han, T., Proctor, W.R., Costales, C., Everett, R., and Thakker, D.R. The Role of the Organic Cation Transporter 1 (OCT1) and Plasma Membrane Monoamine Transporter (PMAT) in Metformin Apical Uptake in Caco-2 cells. AAPS Workshop on Drug Transporters, Bethesda, MD, March 2011.

134. Alluri, R.V., Dufek, M.B., Proctor, W.R., Costales, C.L., Everett, R.S., Thakker, D.R. The Role of Intestinal Organic Cation Transporter 1 (Oct1) in Influencing the Intestinal Absorption (Portal Concentrations) and Overall Pharmacokinetics of Metformin in Male Diabetic db/db Mice. AAPS, Washington D.C., October 2011

135. Costales C.L., Proctor W.R., Thakker, D.R. Identification and Characterization of Mouse Cation-Selective Transporters Involved in the Intestinal Absorption of Metformin. AAPS, Washington D.C., October 2011

136. Han, T., Thakker, D.R. The Interaction between Serotonin Reuptake Transporter (SERT) and Metformin: Mediating the Mechanisms of Absorption and Adverse Effects of Metformin. AAPS, Washington D.C., October 2011

137. Zane, N., Thakker D.R. *In Vitro* Data Suggest Decreased Metabolic Clearance of Voriconazole in Pediatric CYP2C19-Poor Metabolizers with Normal CYP3A4 Activity. AAPS, Washington D.C., October 2011

138. Zhang, Y., Everett, R.S., Thakker, D.R. Are MCF-7 Cells a Relevant *In Vitro* Model for Evaluating Metformin Anticancer Efficacy in Breast Cancer? AAPS, Washington D.C., October 2011

141. Han, T.H., Everett, R.S., Proctor, W.R., Ng, C.M., Costales, C.L., and Thakker, D.R., Intestinal Cation-Selective Transporters Involved in the Apical Uptake, Accumulation and Absorption of Metformin. Globalization of Pharmaceutics Education Network (GPEN) Meeting, Australia, 2012

142. Han, T.H., Proctor, W.R., Costales, C.L., Everett, R.S., and Thakker, D.R., Cation-Selective Transporters Involved in the Apical Uptake and Accumulation of Metformin in Caco-2 Cell Monolayers. AAPS– Chicago, IL, 2012

143. Han, T.H., Everett, R.S., Proctor, W.R., Ng, C.M., Costales, C.L., and Thakker, D.R., Apical Localization of the Organic Cation Transporter (OCT) 1 in Caco-2 Cell Monolayers, and Human and Mouse Intestine. AAPS– Chicago, IL, 2012

144. Romo-Fewell, O., Han, T.H., Alluri R.V., and Thakker, D.R., Evidence for "Metformin-Like" Cation Transporter-Assisted Paracellular Absorptive Transport of the Dietary Hydrophilic Organic Cation Choline across Caco-2 Cell Monolayers. AAPS– Chicago, IL, 2012

145. Costales C, Alluri R, and Thakker D.R., Metformin Intestinal Absorption and Accumulation in Mouse is Inhibited by Tricyclic Anti-depressant Desipramine: Insights into a Novel Absorption Mechanism of Metformin. AAPS– Chicago, IL, 2012

146. Alluri R, Costales C, and Thakker D. Interactions of Commonly Used Anesthetics on Intestinal Absorption and Systemic Disposition of Metformin. AAPS– Chicago, IL, 2012.

147. Alluri R, Costales C, Everett R, Asokan A and Thakker D. Development of an Adeno-Associated Virus (AAV) Vector-mediated Transporter Knockdown Mouse Model to Study the Contribution of Mouse Organic Cation Transporter 1 (mOct1) in the Intestinal Absorption of Metformin. AAPS– Chicago, IL, 2012

148. Han T, Proctor W, Costales C, Everett R, and Thakker D. Cation-Selective Transporters Involved in the Apical Uptake and Accumulation of Metformin in Caco-2 Cell Monolayers. AAPS– Chicago, IL, 2012

149. Han T, Everett R, Proctor W, Ng C, Costales C, and Thakker D. Organic Cation Transporter 1 (OCT1/Oct1) is Localized to the Apical Membrane in Caco-2 Cell Monolayers and Intestinal Epithelium of Mouse and Human. AAPS– Chicago, IL, October 2012

150. Costales C, Alluri R, and Thakker D. Insights into a Novel Absorption Mechanism of the Antidiabetic Drug Metformin. Globalization of Pharmaceutics Education Network: Ninth Meeting – Melbourne, AU, November 2012.

151. Costales C, Alluri R, and Thakker D. Apical Uptake and Efflux Transporters Enhance the Intestinal Absorption of Metformin in Mouse. AAPS Workshop on Drug Transporters in ADME: From the Bench to the Bedside – Bethesda, MD, 2013.

152. Mackowiak B, Costales C, Alluri R, Han T, Everett R, and Thakker D. Apical Membrane Transporters in Human and Mouse Intestinal Epithelia Mediate Metformin Efflux. AAPS Workshop on Drug Transporters in ADME: From the Bench to the Bedside – Bethesda, MD, 2013.

153. Han T, Everett R, Proctor W, Ng C, Costales C, Brouwer K, and Thakker D. Organic Cation Transporter 1 (OCT1/Oct1) is Localized in the Apical Membrane of Caco-2 Cell Monolayers and Enterocytes. AAPS Workshop on Drug Transporters in ADME: From the Bench to the Bedside – Bethesda, MD, 2013.

154. Han, T.H., Everett, R.S., Proctor, W.R., Ng, C.M., Costales, C.L., and Thakker, D.R., Apical Localization of the Organic Cation Transporter (OCT) 1 in Caco-2 Cell Monolayers, and Human and Mouse Intestine. AAPS Workshop on Drug Transporters in ADME: From the Bench to the Bedside – Bethesda, MD, 2013.

155. Han, T.H., Everett, R.S., and Thakker, D.R., The Interaction Between Serotonin Reuptake Transporter (SERT) and Metformin: A Novel Mechanism of Oral Absorption and Intestinal Adverse Effects of Metformin. AAPS Workshop on Drug Transporters in ADME: From the Bench to the Bedside – Bethesda, MD, 2013.

156. Everett, R.S., Zhang, Y, Onoliwu, I., Bae-Jump, V.L., and Thakker, D.R. Multiple Cation-selective Transporters Contribute to the Anti-proliferative Effect of Metformin in Ovarian Cancer Cell Lines, AACR, Washington, D.C., 2013.

157. Damery, E.F., Zhang, Y., Ononiwu, I.M., Everett, R.S., Bae-Jump, V.L., and Thakker, D.R. Cation-selective Transporters are Critical to the Anti-cancer Efficacy of Metformin in Endometrial Cancer. The Society of Gynecologic Oncology 44th Annual Meeting on Women's Cancer, Los Angeles, CA, 2013.

158. Zane, N.R. and Thakker D.R. A Physiologically Based Pharmacokinetic Model Incorporating Extrahepatic Metabolism Explains Voriconazole Pediatric Bioavailability Differences. The American Society for Pharmacology and Experimental Therapeutics (ASPET), Boston, MA, 2013.

159. Zane NR and Thakker DR. Age-Dependent Differential Gene Expression Explains Higher Voriconazole Clearance in Children. American Association of Pharmaceutical Sciences (AAPS), San Antonio, Tx. November 2013

160. Cai, H., Wahajuddin, M., Alluri, R.V., Everett R.S., and Thakker, D.R. Cation-selective Transporters are Critical Determinants of the Anti-proliferative Effects of Metformin in Breast Cancer Cells. AAPS Annual Meeting, San Antonio, TX, 2013.

161. Zane NR and Thakker DR. Integrating In Vitro Sildenafil Metabolism into a Physiologically-Based Pharmacokinetic (PBPK) Model: Validating a Bottom-Up Modeling Approach. American Association of Pharmaceutical Sciences (AAPS), San Diego, CA. November 2014

162. Zane NR and Thakker DR. In Vitro Techniques to Predict Intestinal First-pass Metabolism in Children and Adults. American Association of Pharmaceutical Sciences (AAPS), San Diego, CA. November 2014

163. Zane NR, Chen Y, Wang M, and Thakker DR. Higher CYP2C19 Functional Activity in Children is Not Entirely Explained by Higher Gene or Protein Expression. International Society for the Study of Xenobiotics (ISSX), San Francisco, CA. October 2014

164. Zane NR, Chen Y, Wang M, and Thakker DR. Evidence for a New Testosterone Metabolite Uniquely formed by CYP3A7: A Potential Probe for CYP 3A7-mediated Metabolism in the Newborn. International Society for the Study of Xenobiotics (ISSX), San Francisco, CA. October 2014

165. Cai, H., Wahajuddin, M., Everett R.S., and Thakker, D.R. Cation-Selective Transporters Enhance the Antitumor Efficacy of Metformin in Xenograft Mouse Models of Breast Cancer. AAPS Annual Meeting, San Diego, CA, 2014.

166. Cai, H., Wahajuddin, M., Everett R.S., and Thakker, D.R. Do cation-selective transporters help or hurt the antitumor efficacy of metformin in breast cancer? AACR Annual Meeting, San Diego, CA, 2014.

167. Thakker, A.R., and Thakker, D.R. Lower Pediatric Oral Bioavailability of Voriconazole is Not Due to Lower Intestinal Bile Salt Concentration in Children. AAPS Annual Meeting, San Diego, CA, 2014.

168. Thakker, A.R., Alluri, R.V., Everett, R.S., and Thakker, D.R. Adeno-associated Viral Vector-mediated shRNA Strategies to Generate Intestinal and Hepatic Metformin Transporters Knockdown Mouse Models. AAPS Annual Meeting, San Diego, CA, 2014.

169. Xia, Y., Thakker, A.R., and Thakker, D.R. A Novel Mechanism for Glucose Lowering Effect of Metformin Involving the Intestine. AAPS Annual Meeting, San Diego, CA, 2014.

170. Hao Cai, Ruth S. Everett, and Dhiren R. Thakker. Cation-Selective Transporters Are Central to the Antitumor Efficacy of Metformin against Breast Cancer. American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Orlando, FL, 2015.

171. Hao Cai, Ruth S. Everett, and Dhiren R. Thakker. Interaction of the Insulin-Dependent and AMPK-Dependent Pathways in Human Breast Cancer Cells Improves the Antiproliferative Efficacy of Metformin. AAPS Annual Meeting and Exposition, Orlando, FL, 2015.

172. Lee, C.M., Zane, N.R., Thakker, D.R. Use of Physiologically-Based Pharmacokinetic Model to Elucidate the Role of Metabolism and Transport in Vincristine Disposition. AAPS Annual Meeting and Exposition; Orlando, FL, 2015

173. Lee, C.M., Thakkar, A., Ward, P.D., Sepassi, K., Thakker, D.R. Use of Human Intestinal Tissue and Modeling to Replace Preclinical Species in the Evaluation of Oral Formulations. AAPS Annual Meeting and Exposition; Orlando, FL. 2015

174. Arti R. Thakkar, Ravindra V Alluri, Chester Costales, Garrett Berry, Aravind Asokan, Ruth S. Everett and Dhiren R. Thakker. Strategies to Generate Intestinal and Hepatic Metformin Transporter Knockdown Mouse Models: Delivery of Transporter-specific Multiple microRNA by Adeno-associated Viral Vector. 7th International Symposium on DMPK, NIPER, Mohali, India, 2015.

175. Staley AS, Roque DR, Schuler KM, Rambally BS, Sampey B, Everett R, Thakker D, Gehrig PA, O'Connor S, Makowski L, Bae-Jump VL. Molecular and metabolic differences of treatment responders versus non-responders in a phase 0 clinical trial of metformin in endometrial cancer. Society of Gynecologic Oncology 47th Annual Meeting on Women's Cancer, San Diego, CA, 2016.

176. Emily Meichun Ko, Stephanie Sullivan, Brooke Rambally, Siobhan O'Connor, Ruth Everett, Dhiren Thakker, Dominic T. Moore, John Byron, Victoria Lin BaeJump. Metformin for the Treatment of Endometrial Hyperplasia. American Society of Clinical Oncology Annual Meeting, Chicago, IL 2016.

179. Christine M Lee, Nicols Zane, and Dhiren R Thakker. A Physiologically-Based Pharmacokinetic Model Suggests that Intracellular Binding, in Addition to Metabolism and Efflux Transport, Defines the Disposition of Vincristine in Adult and Pediatric Populations. AAPS Annual Meeting and Exposition, Denver, CO, 2016

180. Christine M Lee, Hao Cai, and Dhiren R Thakker. Elucidation of the Intestinal Absorption Mechanism of Amoxicillin Using the Caco-2 Cell Monolayer Model and Human Intestinal Tissue. AAPS Annual Meeting and Exposition, Denver, CO, 2016.

181. Hao Cai, Ruth S Everett, and Dhiren R Thakker. Higher Sensitivity of Human Breast Cancer Stem Cells Compared to Non-stem Cancer Cells to Antiproliferative Effect of Metformin Results from Higher Metformin Transporter Expression. AAPS Annual Meeting and Exposition, Denver, CO, 2016.

182. Hao Cai, Ruth S Everett, and Dhiren R Thakker. A Higher Dose of Metformin is Necessary for Treatment of Breast Cancer than the Doses Used for Treatment of Diabetes. AAPS Annual Meeting and Exposition, Denver, CO, 2016.

183. Hao Cai, Ruth S Everett, and Dhiren R Thakker. Inhibition of the Insulin Pathway Sensitizes Breast Tumors to the Anticancer Efficacy of Metformin. AAPS Annual Meeting and Exposition, Denver, CO, 2016.

184. Ben M. Clements, Ruth S Everett, and Dhiren R Thakker. The Critical Nutrient Choline is Absorbed across the Intestinal Epithelium by a Mechanism Similar to the Enterocyte-luminal Cycling Absorptive Transport of Metformin. AAPS Annual Meeting and Exposition, Denver, CO, 2016.

185. Derek L. Bolhuis, Erin F. Damery, Innocent M. Onoiwu, Aakash Patel, Hao Cai, Christine M. Lee, Ruth S. Everett, Victoria L. Bae-Jump, Dhiren R. Thakker. Cation-Selective Transporters are Central to AMPK-mediated Anti-

proliferative Efficacy of Metformin in Endometrial Cancer Cells. AAPS Annual Meeting and Exposition, Denver, CO, 2016.

186. Lawrence C. Ku, P. Brian Smith, Michael Cohen-Wolkowiez, and Dhiren R. Thakker. Interaction between Formula Feedings and Caffeine Pharmacokinetics in Premature Infants. AAPS Annual Meeting and Exposition, Denver, CO, 2016.

187. Dhiren R. Thakker. Strategic Need and Optimal Use of Preclinical Determinants of ADME Properties In Conjunctions with Toxicological Endpoints. AAPS Annual Meeting and Exposition, Denver, CO, 2016.

INVITED LECTURES

1. Clinical Society of Washington, Rockville, MD., 1976.

2. Department of Pharmacology, George Washington University, Washington, D.C., 1977.

3. Department of Chemistry, George Washington University, Washington, D.C., 1977.

4. Syntex Pharmaceutical Co., Palo Alto, CA., 1978.

5. Departments of Medicinal Chemistry and Biochemistry, University of Kansas, Lawrence, KS, 1978.

6. Environmental Health Chemistry Symposium, American Chemical Society, Washington, DC., 1979.

7. 39th International Congress of Pharmaceutical Sciences, Brighton, U.K., 1979.

8. Department of Chemical Technology, Bombay University, Bombay, India, 1980.

9. Cancer Research Institute, Bombay, India, 1980.

10. Bristol Myers Laboratories, Syracuse, NY., 1980.

11. Laboratory of Developmental Pharmacology, National Institute of Child Health and Human Development, NIH, Bethesda, MD., 1981.

12. Laboratory of Biochemistry and Metabolism, NIADDK, NIH, Bethesda, MD., 1981.

13. International Symposium on Biological Reactive Intermediates, Gilford, Surrey, U.K., 1981.

14. Interx-Merck Pharmaceutical Co., Lawrence, KS., 1982.

15. Smith Kline Beckman, Philadelphia, PA., 1982.

16. Indian Pharmaceutical Association, Bombay, India, 1983.

17. Cancer Research Institute, Bombay, India, 1983.

18. National Center for Drugs and Biologics, FDA, Bethesda, MD., 1983.

19. Department of Pharmaceutical Chemistry, University of Kansas, Lawrence, KS., 1984.

20. Smith Kline Beckman, Philadelphia, PA., 1985.

21. Cancer Research Institute, Bombay, India, 1986.

22. Central Drug Research Institute, Lucknow, India, 1986.

23. Bhabha Atomic Research Center, Bombay, India, 1986.

24. Hochest Pharmaceuticals, Bombay, India, 1986.

25. 6th International Catecholamine Symposium, Jerusalem, Israel, 1987.

26. SATO Memorial International Award Lecture at the 107th Annual Meeting of the Pharmaceutical Society of Japan,

Kyoto, Japan, 1987.

27. Nagoya City University, Facility of Pharmaceutical Sciences, Nagoya, Japan, 1987.

28. Tohuku University, Research Institute for Tuberculosis and Cancer Sendai, Japan, 1987.

29. Keio University School of Medicine Tokyo, Japan, 1987.

30. Tokyo College of Pharmacy, Tokyo, Japan, 1987.

31. National Institute of Hygienic Sciences, Tokyo, Japan, 1987.

32. Department of Chemical Technology, Bombay University, Bombay, India, 1987.

33. Laboratory of Bioorganic Chemistry, NIDDk, Bethesda, MD., 1987.

34. Carcinogen Risk Assessment, Banbury Center, Cold Spring Harbar, 1987.

35. Pharmaceutical Institute, School of Medicine, Keio University, Tokyo, Japan, 1988.

36. Tokyo College of Pharmacy, Tokyo, Japan, 1988.

37. Dept. of Pharmaceutical Sciences, Nagoya City University, Nagoya, Japan, 1988

38. Dept. of Medicinal Chemistry, University of North Carolina, 1989.

39. Dept. of Medicinal Chemistry, University of North Carolina, 1990 (presented 3 lectures in a Course on Drug Metabolism).

40. Dept. of Medicinal Chemistry, University of North Carolina, 1991 (presented 3 lectures in a Course on Drug Metabolism).

41. Dept. of Pharmacology, University of North Carolina, 1991.

42. Annual Meeting of the PMA Drug Metabolism Section, New Orleans, 1991.

43. 25th Annual Higuchi Symposium, Lake of the Ozarks, 1992.

44. Enz Lecture, Dept. of Pharmaceutical Chem., University of Kansas, 1992

45. Dept. of Medicinal Chemistry, University of North Carolina, 1992 (presented 3 lectures in a course on Drug Metabolism).

46. Dept. of Medicinal Chemistry, University of North Carolina, 1993 (presented 3 lectures in a course on Drug Metabolism).

47. Dept. of Chemistry, Catholic University, Washington, D.C., 1993.

48. Lab of Bioorganic Chemistry, NIDDK, NIH, 1993.

49. Chaired a session on the "Integration of Preclinical ADME studies in the Preclinical and Clinical Safety Assessment" at the National Meeting of Drug Information Association, at Washington, D.C., 1994.

50. Chaired a session on “Delivery and Disposition of Peptides and Oligonucleotides- Current Status and Future

Challenges" at the annual meeting of the International Society for the Study of Xenobiotics (ISSX), Raleigh, NC, October 1994.

51. Chaired a Special Symposium on "Drug Delivery and Prodrug Technologies" at the 31st ACS Western Regional Meeting, San Diego, CA, October 1995.

52. Conference on "Lead Generation and Optimization", Princeton, NJ, September, 1996.

53. Organized a short course presented a talk on Prodrugs at the 7th North American ISSX Meeting, San Diego, October 1996.

54. Winter Conference on "Medicinal and Bioorganic Chemistry", Steamboat Springs, Colorado, January, 1997.

55. Third International Symposium on Innovations in Pharmaceutical Sciences and Technology", Ahmadabad, India, February 1997.

56. S.N.D.T. College of Pharmacy, Bombay University, Bombay, India, February, 1997.

57. Tata Institute for Cancer Research, Bombay, India, February, 1997.

58. Amylin Pharmaceuticals, San Diego, CA, April, 1997

59. Merck Research, West Point, PA, April, 1997.

60. Proctor & Gamble, Cincinnatti, OH, June, 1997.

61. AAPS Southeast Regional Meeting, Research Triangle Park, NC, June, 1997.

62. Drew University, (faculty), Princeton, NJ, July, 1997.

63. DuPont Merck, Newark, DE, July 1997.

64. Formulations and Drug Delivery, ACS Conference, San Diego, CA, October 1997.

65. Glaxo Wellcome, Inc. Pharmaceutics Division, RTP, NC, January, 1998.

66. Swiss Chemical Society – Minisymposium on Oral Drug Delivery, Basel Switzerland, May, 1998.

67. University of Leuven, Workshop on Industry – Academic Collaborations, Leuven, Belgium, May 1998.

68. Glaxo Wellcome, Inc., Biomet Division, Ware, U.K., May, 1998.

69. AAPS Western Regional Meeting, San Francisco, CA, May, 1998.

70. AAPS Southeastern Regional Meeting, RTP, NC, June, 1998.

71. 28th Annual Gordon Research Conference on Drug Metabolism, Plymouth, NH, July, 1998.

72. Drew University, (faculty), Princeton, NJ, July, 1998.

73. Pfizer, Inc., Groton, CT, July, 1998.

74, Bristol-Meyer Squibb, Inc., Wallingford, CT, July, 1998.

75. School of Pharmacy, University of Michigan, Ann Arbor, MI, September, 1998.

76. Higuchi Research Seminar, Lake of Ozarks, MO, March, 1999.

77. Glaxo Wellcome, Pharmaceutics Dept., RTP, NC, March, 1999.

78. BASF, Boston, MA, June, 1999.

79. Parke Davis, Inc., Ann Arbor, MI, July, 1999.

80. Novartis, East Hanover, NJ, September, 1999.

81. Institute for Innovative Research, (faculty), San Diego, CA, December, 1999.

82. Agouron Pharmaceuticals, San Diego, CA, December 1999.

83. Glaxo Wellcome (Pharmaceutics), RTP, NC, March 2000.

84. Laboratory of Biorganic Chemistry, NIDDK, NIH, Bethesda, MD, May 2000

85. Pratt Fellowship Program, NIH, Bethesda, MD, May 2000

86. Wyeth-Ayerst, Pearl River, N.Y., June 2000

87. Drew University (faculty), Princeton, NJ, June 2000

88. Chiron, CA, 2001.

89. Roche, Palo Alto, CA, 2001

90. Guilford Pharmaceuticals, Baltimore, MD, 2001

91. Drew University (faculty), Princeton, NJ, 2001

92. Drew University (faculty), Course Organizer, priceton, NJ, 2001

93. Transform Pharmaceuticals, Boston, MA, 2001

94. Bristol-Myers Squibb, Princeton, NJ, 2001

95. Albany Biolomolecules, Albany, NY, 2001

96. Lilly Pharmaceuticals, Indianapolis, IN, 2001

97. 3-D Pharmaceuticals, Philadelphia, PA, 2001

98. Pfizer, Ann Arbor, MI, 2002

99. Gilford Pharmaceuticals, Baltimore, MD, 2002

100. Pfizer (Agouron), San Diego, CA, 2002

101. Serono Pharmaceuticals, Soreno, Switzerland, 2002

102. Avantis, Frankfurt, Germany, 2002

103. Bristol Myers Sqibb, Lawrenceville, NJ, 2002

104. Avantis, Pearl River, NJ, 2002

105. Roche, Nutley, NJ, 2002

106. Pfizer, Groton, CT, 2002

107. GPEN, Detriot, MI, 2002

108. GlaxoSmithKline, Philadelphia, PA, 2002

109. Arena Pharmaceuticals, San Diego, CA, 2002

110. Drew University, Newark, NJ, 2003

111. Novartis, Jolla CA, 2003

112. AstraZeneca, Boston, MA, 2003

113. Fibrogen, San Francisco, CA 2003

114. ADMET-1, San Diego, CA 2004

115. AstraZeneca, San Diego, CA 2004

116. LabFusion, Boston, Ma 2004

117. Millennium, Cambridge, MA 2004

118. Schering-Plough, Kenilworth, NJ 2004

119. Neurocrine, San Diego, CA 2004

120. Abbott, Abbott Park, IL 2004

121. Pfizer, Groton, CT, 2005

122. ICOS, Bothell, WA, 2005

123. SCIOS, Inc. San Francisco, CA, 2005

124. Biogen, Cambridge, MA 2005

125. Genzyme, Framingham, MA 2005

126. Sunesis, San Francisco, CA 2005

127. Drew University, Newark, NJ 2005

128. Amgen, Boston, MA, 2005

"Probing the Intestinal Epithelial Barrier: A Tortuous Journey"

129. Pediatric Pharmacology Research Unit Network Meeting, Washington, D. C., 2005
"Implementing In Vitro Drug Disposition Studies to Improve Pediatric Therapy – Challenges and Opportunities"

130. Cambridge Healthcare Institute – Mastering Medicinal Chemistry/ADME In-depth, San Francisco, CA, 2006
"ADME In-depth: A Medicinal Chemistry Perspective" (Lead Lecture)

131. Scitech Center, Mumbai, India, 2006
"Integration of ADME in Drug Discovery: Past, Present, and Future"

132. Indian Drug Manufacturers' Association Meeting – Bioavailability and Bioequivalence, Mumbai, India, 2006.
"Integration of ADME in Drug Discovery: Past, Present, and Future"

133. PERD Center, Ahmedabad, India, 2006
"Integration of ADME in Drug Discovery: Past, Present, and Future"

"Probing the Intestinal Epithelial Barrier: A Tortuous Journey"

134. Drew University, Madison, NJ, 2006.
"Use of Preclinical Pharmacokinetics and In Vitro Models to Assess Problems of Poor Oral Bioavailability" (with Kim Brouwer)

"Role of Intestinal and Hepatic Metabolism in Drug Clearance – Chemical Strategies to Optimize Metabolic Clearnce"

135. Genentech, San Francisco, CA, 2006.
"Use of Preclinical Pharmacokinetics and In Vitro Models to Assess Problems of Poor Oral Bioavailability" (with Kim Brouwer)

"Role of Intestinal and Hepatic Metabolism in Drug Clearance – Chemical Strategies to Optimize Metabolic Clearance"

136. New Jersey Drug Metabolism Discussion Group, Newark, NJ, 2006.
Intestinal Drug Transport: A Black Box or a Target for Rational Design of Orally Active Drugs?

137. Bristol Myers Squibb, NJ, 2006.
Interplay of Transport and Metabolism in the Intestinal Epithelium

138. Nektar Pharmaceuticals, Mobile, Alabama/San Diego, CA, 2007
"Use of Preclinical Pharmacokinetics and In Vitro Models to Assess Problems of Poor Oral Bioavailability" (with Kim Brouwer)

"Role of Intestinal and Hepatic Metabolism in Drug Clearance – Chemical Strategies to Optimize Metabolic Clearnce"

139. Molecular Medicine Tri-Conference – ADMET short course, San Francisco, CA, February, 2007.
Lead Speaker - *In Vitro* ADME Assays: Strategic Application to Drug Discovery

140. New England Drug Metabolism Discussion Group Symposium, Boston, MA, April 2007
"Drug Metabolism-Pharmacokinetics-guided (DM/PK-guided) Lead Optimization: A Historical Perspective of a Paradigm Shift"

141. Bayer Pharmaceuticals, Dusseldorf, Germany, January 2008

"Use of Preclinical Pharmacokinetics and In Vitro Models to Assess Problems of Poor Oral Bioavailability" (with Kim Brouwer)

"Role of Intestinal and Hepatic Metabolism in Drug Clearance – Chemical Strategies to Optimize Metabolic Clearance"

142. Molecular Medicine Tri-Conference – ADMET short course, San Francisco, CA, March, 2008.
Lead Speaker – "*In Vitro* ADME Assays: Strategic Application to Drug Discovery"

143. Sepracor Short Course, Boston, MA, July 2008
"Use of Preclinical Pharmacokinetics and In Vitro Models to Assess Problems of Poor Oral Bioavailability- Part 2

144. University of Toronto, Canada, August 2008
"Orally Active Hydrophilic Cationic Drugs – Design or Serendipity?"

145. National Institute of Pharmaceutical Education and Research (NIPER) 1st International Symposium on Metabolism and Pharmacokinetics, Chandigarh, India, 2009
"Introduction to Drug Transporters"
"Pharmacogenomics of Drug Transporters"

146. Wolfe Biopharma , Conference – Filling Biopharma's Pipeline Boston, MA, April 2009
"ADMET: Strategic Use of In Vitro and Preclinical Studies to De-risk Clinical Candidates"

147. GSK, Research Triangle Park, NC, August 2009
"A Novel Mechanism for Intestinal Absorption of Metformin: Possible Role in Metformin Pharmacology"

148. Asian Symposium on ADMET Profiling for Drug Discovery: Metabolism and Medication Safety, September 2009
"Role of ADME in Adverse Effects of Drugs" – Keynote Address

149. J & J, La Jolla, CA, November 2009
"Overcoming the Intestinal Barrier: Challenges and Opportunities for Oral Drug Delivery"

150. Institute of Pharmaceutical Education and Research (NIPER) 2nd International Symposium on Metabolism and Pharmacokinetics, Chandigarh, India, 2010
"Understanding the Role of Transporters in Efficacy and Adverse Effects of Therapeutic Agents: Past, Present, and Future"

151. Advinus Therapeutics, Poone, India, March 2010.
"Transporters in Efficacy and Adverse Effects of Therapeutic Agents"

152. Scitech, Mumbai, Bombay, India, March, 2010.
"Transporters: An Overview of the Role of Transporters in Drug Development"

153. Medicinal Chemistry Symposium, National University of Singapore, Singapore, September 2010: "Challenging Landscape of Drug Discovery in the 21st Century"

154. Institute of Pharmaceutical Education and Research (NIPER) 3rd International Symposium on Metabolism and Pharmacokinetics, Chandigarh, India, February, 2011: "Transporters in Drug Efficacy and Toxicity: Revisiting History and Looking to the Future"

155. Indian Institute of Technology –Bombay, India, February, 2011: "Absorption of Therapeutic Agents across the Intestinal Epithelial Barrier: A Tortuous Journey"

156. ISF College of Pharmacy, Moga, India, February, 2011: "Strategies to Design Orally Active Therapeutic Agents"

157. Ili Lilly & Co., April, 2011: "Interactions of Metformin and Loperamide with the Intestinal Epithelial Barrier: A New Look at Old Drugs"

158. New Jersey Drug Metabolism Discussion Group, October 2011: "Interplay of Drug Metabolizing Enzymes and Transporters".

159. Bristol Myer Squibb, New Jersey, October 2011: "Interplay of Drug Metabolizing Enzymes and Transporters".

160. American Association of Indian Pharmaceutical Scientists – Dr. R. S. Baichwal Seminar – Department of Pharmaceutical Sciences and Technology, Institute of Chemical Technology, Bombay, India, February 2012:
Chair, Symposium on "ADME (DM/PK) as a Success Factor in Drug Discovery"

161. American Association of Indian Pharmaceutical Scientists – Dr. R. S. Baichwal Seminar – Department of Pharmaceutical Sciences and Technology, Institute of Chemical Technology, Bombay, India, February 2012: Symposium on "ADME (DM/PK) as a Success Factor in Drug Discovery
"Science and Application of Absorption, Distribution, Metabolism, Excretion (ADME) in Therapy: Past, Present, and Future"

162. Dow Chemical, Mumbai, India, February 2012:
"Activation of Phospholipase C: A Serendipitous Discovery in Search of Applications"

163. Indian Institute of Technology, Bombay, India, February 2012:
"Transporters in Drug Efficacy and Toxicity: Past Present, and Future"

164. Institute of Pharmaceutical Education and Research (NIPER) 4th International Symposium on Drug Metabolism and Pharmacokinetics, Chandigarh, India, February 2012:
"Intestinal Transport-Metabolism Interactions"

165. The Delaware Valley Drug Metabolism Discussion Group, Langhome, PA, September 2012:
"Complex Interplay of Intestinal Apical Uptake/Efflux and Basolateral Efflux Transporters in Affecting Oral Absorption of Hydrophilic Ionic Compounds: Implications for Drug-drug Interactions"

166. The joint conference of the Australasian Pharmaceutical Science Association – Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists, December 2012: Role of organic cation transporters in mediating oral drug absorption"

167. Applied Pharmaceutical Analysis-India, Annual Meeting, Hyderabad, India, March, 2013:
"Intestinal Transporters: A Gateway to the Body but Also a First Line of Defense"

168. National Institute of Pharmaceutical Education and Research (NIPER) 5th International Symposium on Drug Metabolism and Pharmacokinetics, Chandigarh, India, March 2013:
A Keynote Address - "DMPK in the 21st Century"

169. Scitech Center, Mumbai, Bombay, India, March 2013:
"DMPK in the 21st Century"

170. Parul Institutes - College of Pharmacy, Baroda, India, March 2013:
"Complex Interplay of Intestinal Apical and Basolateral Transporters Affecting Oral Absorption of Hydrophilic Ionic compounds: Implications for DDI"

171. University of Maryland School of Pharmacy, November 2013:
"The Metformin Story: How Multiple Transporters Affect Its Oral Absorption, Efficacy in Type II Diabetes and Cancer, and Adverse Effects"

172. Applied Pharmaceutical Analysis-India, Annual Meeting, Ahmedabad, India, February 2014:
"Transporter-driven Vectorial Transport of Cationic, Anionic, and Zwitterionic Drugs in the Intestine"

173. National Institute of Pharmaceutical Education and Research (NIPER) 6th International Symposium on Drug Metabolism and Pharmacokinetics, Chandigarh, India, February28-March 2 2014:
"The Journey of Metformin in the Intestine and Tumors: How Transporters Affect Metformin Pharmacology in Diabetes and Cancer"

174. Institute of Chemical Technology, Department of Pharmaceutical Sciences and Technology, Mumbai, India, March 2014:
Organizer of Dr. R. S. Baichwal Seminar: "Intellectural Property in an Academic Institution: Conception to Commercialization"

175. Institute of Chemical Technology, Department of Pharmaceutical Sciences and Technology, Mumbai, India, March 2014:
Dr. R. S. Baichwal Seminar: Intellectural Property in an Academic Institution: Conception to Commercialization:
"Creation of Intellectual Property and Entrepreneurism: An Integral Part of Academic Pursuit in 21st Century"

176. Piramel Enterprises Ltd., Mumbai, India, March 2014:
"How Transporters Affect Metformin Pharmacology in Diabetes and Cancer"

177. Pharmaceutical Sciences World Congress, Melbourne, Australia, April 2014:
Debate on "Carrier Mediated Transport through Membranes: The Exception or The Rule"

178. Pharmaceutical Sciences World Congress, Melbourne, Australia, April 2014:
"Interplay of Drug Metabolizing Enzymes and Transporters" in a Symposium entitled "Barrier Mechanisms Team Up: Interplay between Transporters, Enzymes, and Tight Junctions"

179. Nicolae Testemitanu State University of Medicine an Pharmacy of the Republic of Moldova, Chisinau, Moldova, April 2014:
"Inside UNC Eshelman School of Pharmacy: Highlighting the Research Enterprise, Educational Outreach, and Health care Impact"

180. North Dakota State University, Fargo, North Dakota, May 2014:
"Creation of Intellectual Property and Entrepreneurism to Translate Discoveries for Societal Benefit: An Integral Part of Academic Pursuit in 21st Centrury" in a Symposium entitled "Frontiers in Biomedical Research"

181. National Institute of Pharmaceutical Education and Research (NIPER) 6th International Symposium on Drug Metabolism and Pharmacokinetics, Chandigarh, India, February28-March 2 2015:
"Transporters in Breast Cancer Cells Play a Critical Role in Anticancer Efficacy of Metformin".

182. Applied Pharmaceutical Analysis-India, Annual Meeting, Mumbai, India, February 2015:
"Four Cation-selective Transporters Contribute to Intestinal Absorption and Pharmacology of The Type II Diabetes Drug Metformin".

183. JSS University, School of Pharmacy, Mysore, India, February 2015:
"Inside UNC Eshelman School of Pharmacy: Highlighting the Research Enterprise, Educational Outreach, and Health care Impact"

184. AAPS Annual meeting (Sunrise Session), Denver, CO, November 2016
"Strategic Need and Optimal Use of preclinical determination ADME of ADME properties in conjunction with Toxicological endpoints"