

UNIVERSITY OF ILLINOIS
AT CHICAGO

Department of Biopharmaceutical Sciences (MC 865)
College of Pharmacy
833 South Wood Street
Chicago, Illinois 60612-7231

March 25, 2003

Dockets Management Branch (HFA-305)
Food and Drug Administration
5630 Fishers Lane, Room 1061
Rockville, MD 20852

RE: Docket Number OOP-1378
Draft Guidance: Alpha Hydroxy Acids as Ingredients

Dear FDA Officers:

First, please accept my sincere apology for submitting this late response regarding your Draft Guidance for Industry: Labeling for Topically Applied Cosmetic Products primarily because of my belated awareness of the document. I also would like to commend you on your fine efforts in addressing this timely issue.

I am in full agreement with your general policy and thinking in this regard. However, I wish to point out that there may be a need for exception in your guidance. I am hoping that you could kindly consider my reasoning presented below before you adopt a final, fair and balanced guidance at this time.

Among many alpha hydroxy acids used commercially, it appears that only two compounds, lactic acid (or lactate) and citric acid are **endogenous compounds**. These two compounds are expected to be very safe at low concentrations such as below 0.1 to 0.3% in products. Low concentrations of these two compounds may be formulated in topical products as electrolytes, nutrients or buffering agents. Also, citric acid may be used as a chelating agent (instead of using **triethanolamine, a xenobiotic**) in enhancing the stability of products. The above assumption of safety seems very reasonable because glycolic acid (**a xenobiotic**) and lactic acid have been concluded to be safe at concentration below <10%.

In view of the above, I would like to strongly recommend that in your final guidance, use of lactic acid (or sodium lactate) or citric acid below 0.3% or other appropriate strength can be exempted. I believe that this exemption is scientifically justifiable at this moment and would not appear to be "too aggressive" or "over reactive".

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Your kind consideration of the above suggestion is deeply appreciated. Please contact me at 312-996-6274 if you have any questions.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'W. L. Chiou', with a stylized flourish at the end.

Win L. Chiou, Ph.D.
Professor of Pharmacokinetics

Win L. Chiou, Ph.D.

Dr. Chiou is currently a full-time Professor of Pharmacokinetics at the College of Pharmacy, the University of Illinois at Chicago and the President of Chiou Consulting Inc. in Burr Ridge, IL. He received his B.S. in Pharmacy from the National Taiwan University in 1961 and his Ph.D. in Pharmaceutical Chemistry from the University of California San Francisco Medical Center in 1969.

In 1969, Dr. Chiou joined the Washington State University as Assistant Professor of Pharmacy, and in 1971, he joined the University of Illinois as Assistant Professor of Pharmacy. He was promoted to Associate Professor of Pharmacy in 1973 and to Full Professor of Pharmacy and Occupational and Environmental Medicine (in School of Public Health) in 1976. He has served for years as Director of Clinical Pharmacokinetics Laboratory, Interim Head of the Department of Pharmaceutics and Pharmacodynamics and Director of Graduate Studies in Pharmacy at the University of Illinois. He has served as President of the National Taiwan University School of Pharmacy Alumni Association in North America.

Dr. Chiou is internationally recognized for his research contributions in solid dispersions, bioanalysis, biopharmaceutics and pharmacokinetics. He holds a US patent on solid dispersions and has a successful commercial ultramicronized griseofulvin product, Gris-peg®, from that invention. Dr. Chiou has about 220 publications, and more than 80 (34 in the last 3 years) invited presentations.

Dr. Chiou is an elected Fellow in four professional organizations including the American Association of Pharmaceutical Scientists (AAPS). He has served on the editorial boards of seven professional journals, including Journal of Pharmacokinetics and Pharmacodynamics, Journal of Pharmaceutical Sciences and Journal of Chromatography Biomedical Applications, on the Food and Drug Administration's Generic Drugs Advisory Committee and Expert Panel on Biopharmaceutical Classification Systems. He has also served on the NIH Study Section as an ad hoc member. In 2001, he received the National Taiwan University Distinguished Alumnus Achievement Award.

Dr. Chiou's publications are well cited. For example, his 1971 review article on pharmaceutical applications of solid dispersions and his 1978 paper on trapezoidal rule has been each cited about 400 times. He has provided important new insights on many fundamental pharmacokinetic concepts in areas of arterial-venous drug concentration differences, distribution kinetics in blood and its implications, permeability coefficients, creatinine excretion mechanisms and disposition kinetics, accumulation (plateau) principle, interspecies relationship in absorption and clearance, the role of p-glycoprotein in absorption and hepatic metabolism, and the erythromycin breath test. His Chiou Equation has been commonly used for theophylline dosing determination in patients and his discovery of acetonitrile as a simple deproteinizing agent has been routinely used worldwide.

Dr. Chiou has successfully mentored many graduate students and postdocs. For example, nine of them are presently working at the Food and Drug Administration including two in policy-making positions, both being elected AAPS Fellows (Dr. Mei-Ling Chen, Associate Director in the Office of Pharmaceutical Sciences and Dr. Shiew-Mei Huang, Deputy Director of Science in the Office of Clinical Pharmacology and Biopharmaceutics). In addition, one is a founder of some 7000-employee IVAX Corporation and another one is Associate Editor of New Drug Metabolism.

Win L. Chiou, Ph.D.

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E-mail: Chiou@uic.edu

Present Positions:

Professor of Pharmacokinetics; Full Professor rank since 1976 at UIC
President, Chiou Consulting Inc. (Burr Ridge, IL.) since 2000

Education:

B.S. in Pharmacy (1961), National Taiwan University
Ph.D. in Pharmaceutical Chemistry (1969), University of California, San Francisco
(Specialization in Biopharmaceutics and Pharmacokinetics; under the advising of late Dr. Sidney Riegelman)

Previous Positions Held:

1969-1971: Assistant Professor of Pharmacy, Washington State University.
1971-1973: Assistant Professor of Pharmacy, College of Pharmacy, UIC.
1973-1976: Associate Professor of Pharmacy and Occupational and Environmental Medicine.
1976-1982: Professor of Pharmacy, Department of Pharmacy, College of Pharmacy, UIC.
1975-1979: Director of the Clinical Pharmacokinetics Laboratory, College of Pharmacy.
1976-1977: Professor of Occupational and Environmental Medicine, School of Public Health.
1992-1995: Director of the Graduate Study in "Pharmaceutics", College of Pharmacy.
1994-1997: Interim Head, Department of Pharmaceutics and Pharmacodynamics.
1994-1999: Director, Graduate Studies in Pharmacy.
2002- Professor, Department of Biopharmaceutical Sciences.

Elected Fellows:

1. American College of Clinical Pharmacology (1978)
2. Academy of Pharmaceutical Sciences, American Pharmaceutical Association (1984).
3. American Association of Pharmaceutical Scientists (1987)
4. Academy of Pharmaceutical Research and Science, American Pharmaceutical Association (1988)

Editorial (Advisory) Boards:

Journal of Pharmacokinetics and Biopharmaceutics (1992 to 2000)
Journal of Pharmacokinetics and Pharmacodynamics (since 2001)
Journal of Pharmaceutical Sciences (1991-1997)
International Journal of Clinical Pharmacology and Therapeutics (since 1980)
Journal of Chromatography-Biomedical Applications (1980-1993)
Journal of Clinical Pharmacy and Therapeutics (1980-1994)
Biopharmaceutics and Drug Disposition (since 1994)
The Chinese Pharmaceutical Journal (since 1994)

Listing in:

Who's Who in the World (since 1993)
Who's Who in Science and Engineering (since 1993)
Who's Who in American Education (since 1993)
Who's Who in the Midwest (since 1993)
American Men and Women of Science (since 1978)
American men and Women of Science: Consultants (Since 1972)

Awards:

Elected Fellows in four professional organizations (see above)
Lederle Pharmacy Faculty Awards (1970, 1971 and 1974)
Award for Excellence in Research, Rho Chi Chapter at the University of Illinois (1974)
Award for contribution to the 30th Anniversary of the School of Pharmacy, National Taiwan University (1983)
Distinguished Achievement Award from the North America Alumni Association of the National Taiwan University School of Pharmacy (1987)
ICAST 96 Certificate of Appreciation presented by the Chinese Academic and Professional Association in Mid-America (1996)
Certificate of Appreciation for being a key-note speaker at the annual convention presented by the Pharmaceutical Society of the Republic of China (1998)
National Taiwan University Distinguished Alumnus Achievement Award (2001)

Visiting Scholar:

National Defense Medical Center, School of Pharmacy, Taipei, Taiwan (July 1994; to be postponed).

Membership in Professional Organizations:

American Association of Pharmaceutical Scientists
American Pharmaceutical Association
North America Taiwanese Professors' Association
Mid-America Chinese Science and Technology Association
American Association of Colleges of Pharmacy
Controlled Release Society
American College of Clinical Pharmacology
American Association of University Professors
American Chinese Pharmaceutical Association
National Taiwan University School of Pharmacy Alumni Association in North America
American Association for the Advancement of Science
International Association for Therapeutic Drug Monitoring and Clinical Toxicology
Taiwanese Bioscientists of America
American Society of Clinical Pharmacology and Therapeutics

Membership in Honorary Societies:

Rho Chi - Pharmaceutical Honorary Society

Sigma Xi - National Honorary Scientific Society

Organizational Committees or Offices Served:

1. Ad hoc member of the Pharmacology Study Section of the National Institutes of Health, October 27-29, 1981.
2. An honorary member of the organizing committee of the 30th anniversary of School of Pharmacy, National Taiwan University, 1983.
3. Board member of Ching-Kang Foundation for Pharmacy Promotion (1987-1990)
4. President of the National Taiwan University School of Pharmacy Alumni Association in North America for 1988 and 1989.
5. Co-Chair for a plenary session at the 1989 International Chemistry Conference, Taipei: Analytical Chemistry, sponsored by the Chinese Chemical Society, National Science Council of the Republic of China etc.
6. A co-organizer for a workshop on the Formulation and Manufacture of Pharmaceutical Products sponsored by the National of Science Council of the Republic of China, and held in Taipei, April 9-11, 1990.
7. Serving as a Chicago Program Coordinator for the visit of US-Canada Pharmaceutical Technology Mission from the Republic of China, October 25-27, 1989.
8. Serving on the Generic Drugs Advisory Committee of the Food and Drug Administration between 1990 and 1994, appointed by the Secretary of Health and Human Service.
9. Serving on the Advisory Committee of the American Pharmaceutical Association to select the Editor of J. Pharm. Sci. (1991).
10. Serving on the 1991 Meritorious Manuscript Award Committee of the American Association of Pharmaceutical Scientists.
11. Serving on the Subcommittee on Biotechnology and Pharmaceutical Sciences, National Health Research Institute, Department of Health, Republic of China (1992-1993).
12. Chairperson, Pharmacy section, International Symposium on Pharmaceutical Sciences, sponsored by the National Taiwan University School of Pharmacy Alumni Association in North America, June 30 - July 2, 1995, Herndon, Virginia.
13. Chair, Program Committee, the 12th International Conference on Advanced Science and Technology, University of Illinois at Chicago, April 6-8, 1996.
14. Co-Chair in the session on Pharmacokinetics and Product Development, the 12th Conference on Advanced Science and Technology, University of Illinois at Chicago, April 6, 1996.
15. Number of Expert Panel for Biopharmaceutics Drug Classification System of the Food and Drug Administration (1997).
16. Chairperson of Biopharmaceutical Sciences Session, 14th International Conference on Advanced Science and Technology, Lucent Technology, Naperville, IL., April 3-5, 1998.

17. Co-Chair of the Pharmaceutical Sciences Session, 15th International Conference on Advanced Science and Technology, Argonne Laboratory, April 2-3, 1999.
18. Member of the Board of Director, National Taiwan University Alumni Association in Great Chicago (1998-2000).
19. President of the Taiwan Provincial Hsinchu High School Alumni Association in Great Chicago (1995-2001).
20. Advisor (1999-2002), Ching-Kang Foundation for Pharmacy Promotion (Taiwan).
21. Chair, Fund Raising Committee, National Taiwan University School of Pharmacy Alumni Association in North America (1999-2002).
22. Chair for Research and Teaching Section, 2001 National Taiwan University Medical College Annual Convention, Anaheim, CA Aug. 3-5.
23. Chair for organizing a pharmaceutical scientific program at the 2002 Annual Convention of the National Taiwan University Medical College Alumni Association in North America, Chicago, August 16-8, 2002.

Invited Lectures/Seminars:

1. A seminar on the pharmaceutical applications of solid dispersion systems at the Abbott Laboratories, North Chicago, March 13, 1974
2. A seminar on the pharmacokinetics and toxicity of aerosol propellants at the School of Pharmacy, University of Kansas, March, 1974
3. A seminar on the pharmacokinetics of creatinine and its clinical applications at the Department of Pharmacology and Physiological Sciences and the Committee on Clinical Pharmacology, University of Chicago, May 13, 1975
4. The above mentioned seminar at the Department of Pharmacology, University of Illinois, May 16, 1975.
5. A talk on the interactions between butaperazine and antacids at the Research Division of the Illinois State Psychiatric Institute, September 18, 1975.
6. A seminar on the dissolution and polymorphic studies on digoxin and digitoxin at the Department of Pharmacy, University of Illinois, March 12, 1976
7. A talk at the conference (September, 1974, Washington, D.C.) on the safety of aerosol propellants sponsored by the American Cosmetics and Toiletry and Frangance Association.
8. A lecture on the HPLC assays of drugs and metabolites in plasma and urine at the Second Annual High Performance Liquid Chromatography School, September 15, 1977, sponsored by the Chicago Chromatography Discussion Group.
9. A lecture on the high-pressure liquid chromatography in therapeutic monitoring at the Toxicology Workshop, December 8, 1977, sponsored by the Department of Pathology, Abraham Lincoln School of Medicine, University of Illinois, Chicago.

10. Invited by the American Association for Clinical Chemistry (AACC) and its Illinois Section to present a talk on the problem asthmatic and theophylline monitoring, in a symposium on "Therapeutic drug monitoring in the pediatric patient", September 29, 1978, Chicago.
11. Invited by the AACC and its Pacific Northwest Section for the above mentioned talk, February 16, 1979, Portland.
12. Invited by the AACC and its Southern California Section for the above mentioned talk, March 10, 1979, San Diego.
13. Invited by the AACC and its Detroit Section for the above mentioned talk, April 26, 1979, Detroit.
14. Invited by the AACC and its Northern California Section for the above mentioned topic, May 18, 1979, Berkeley.
15. A seminar on some theoretical considerations of pharmacokinetics analyses at the Department of Pharmacology, Rush Medical School, August 12, 1980, Chicago.
16. A talk on the nonrenal elimination, extensive renal tubular reabsorption and secretion of creatinine in humans and animals at the Sidney Riegelman Memorial Symposium of Pharmacokinetics: A modern view, April 22-24, 1982 in San Francisco.
17. A special lecture on the new perspectives In pharmacokinetics at the 30th Anniversary Memorial Symposium, School of Pharmacy, National Taiwan University, NTU, July 30-31, 1983, Taipei, Taiwan.
18. A series of talks on the bioavailability and pharmacokinetics studies at the United Pharmaceutical Co. in Manila, Philippine on August 3-6, 1983.
19. A lecture on new perspectives in pharmacokinetics at the Academy of Pharmaceutical Sciences Midwest Regional Meeting in Chicago on April 2, 1984.
20. A lecture on a new approach to study organ drug clearance and its applications in pharmacokinetics at the plenary symposium sponsored by the Federation of Asian Pharmaceutical Association in Taipei, Taiwan on November 18-24, 1984.
21. A lecture on the biopharmaceutics, pharmacokinetics and pharmacodynamics of furosemide at the scientific section symposium sponsored by the Federation of Asian Pharmaceutical Association In Taipei, Taiwan on November 18-24, 1984.
22. A talk on the prospects of pharmaceutical research and development in Taiwan to a group of some 30 pharmaceutical chief executives in Taiwan on November 22, 1984.
23. A seminar on the rationale and pharmacokinetics implications of the dependency of drug concentration on the sampling site to the Bristol-Myers Company (Syracuse, New York) on April 29, 1985.
24. A seminar on the rationale and pharmacokinetics implications of the dependency of drug concentration on the sampling site at the College of Pharmacy, University of Texas at Austin on May 9, 1985.

25. A seminar on the animal scale-up in drug absorption and disposition kinetics to Ciba-Geigy, pharmaceutical laboratories, Summit, New Jersey on June 3, 1987.
26. A lecture on the determination of drugs and metabolites in biological fluids by high performance liquid chromatography at 1989 International Chemistry Conference, Taipei: Analytical Chemistry, April 9-12, 1989, sponsored by the Chinese Chemical Society and National Science Council of China and Department of Health.
27. A seminar on the determination of drugs and metabolites in biological fluids by high-performance liquid chromatography at the School of Pharmacy, National Taiwan University on April 17, 1989.
28. To present a seminar (#27) at the School of Pharmacy, National Defense Medical Center, Taipei, on April 21, 1989.
29. A seminar on the implications of marked dependence of drug concentration on the blood sampling site in pharmacokinetics and pharmacodynamics at the College of Pharmacy and Allied Health Professions, Wayne State University, Michigan, on March 20, 1990.
30. Two lectures on the pharmaceutical applications of solid dispersion system at a workshop on the formulation and manufacture of pharmaceutical products sponsored by the National Science Council of the Republic of China, April 9-11, 1990, Taipei.
31. A special lecture on a new look at the pharmacokinetics and pharmacodynamics: sampling sites and distribution kinetics in blood sponsored by the Pharmaceutical Society of the Republic of China in Taipei, on April 16, 1990.
32. A seminar on a new look at the pharmacokinetics and pharmacodynamics: sampling sites and distribution kinetics in blood at the Department of Pharmacology and Toxicology, The University of Mississippi Medical Center, Mississippi, April 30, 1990.
33. A lecture on the significance of marked universal dependence of drug concentration on blood sampling site in pharmacokinetics and pharmacodynamics at the Biomedical Simulation Resource Workshop on Advanced Methods of Pharmacokinetics and Pharmacodynamics Systems Analysis sponsored by the School of Engineering, University of Southern California, May 19-20, 1990.
34. A lecture on the importance of blood sampling site in the drug monitoring and toxicology at the 2nd International Congress of Therapeutic Drug Monitoring and Toxicology, October 9-12, 1990, Barcelona, Spain.
35. Two lectures on pharmacokinetics in a workshop on "Quantitative structure-activity relationships, side effects and drug design", on October 15-17, 1990 in New Jersey, sponsored by the Center for Professional Advancement.
36. A lecture on the effect of sampling site on drug concentration at the Fall Meeting of the American Association Clinical Chemistry Upstate New York Section in Rochester, New York, October 10-11, 1991.
37. A seminar on a century-old misconception in health sciences: rapid mixing of drug in blood circulation and implications presented to the College of Pharmacy, University of Illinois at Chicago, January 15, 1992.

38. A lecture on the effect of venous vs arterial sampling in pharmacokinetics at the 4th Symposium on Frontiers of Pharmacokinetics and Pharmacodynamics sponsored by National Center for Toxicological Research/FDA, Little Rock, Arkansas, March 18-20, 1992.
39. Two lectures on pharmacokinetic studies in new drug development in a workshop on Bioavailability and Bioequivalence sponsored by Department of Health, Republic of China, Taipei, June 18-20, 1992.
40. A seminar on toxicokinetics: Scale-up from animals to humans presented to the Institute of Toxicology, College of Medicine, National Taiwan University, Taipei, June 25, 1992.
41. A lecture on the first-pass accumulation of drugs in gut wall after oral administration at the National Taiwan University School of Pharmacy on July 31, 1993.
42. A talk on prediction of drug absorption after oral administration from the *in situ* closed intestinal loop study in rats at the Annual International Particle Size Association Convention in Chicago, Aug. 19, 1993.
43. A seminar on the intestinal absorption and modeling at the National Taiwan University School of Pharmacy, December 26, 1994.
44. A talk on some new concepts in intestinal absorption and modeling at the International Conference in Pharmaceutical Sciences sponsored by the National Taiwan University School of Pharmacy Alumni Association in North American, Herndon, Virginia July 30- August 2, 1995.
45. A talk on my current research on drug absorption at the School of Pharmacy, National Taiwan University, June 5, 1996.
46. A seminar on the challenge to the conventional permeability coefficient concept and a new reliable method to predict the extent of oral absorption in humans at the Department of Pharmaceutics and Pharmacodynamics, UIC (November 19, 1997).
47. A talk on “new drug development: are man and rat alike in pharmacokinetics and pharmacodynamics?” at the 14th International Conference on Advanced Science and Technology, Naperville, IL. April 4, 1998.
48. A talk on “Prediction of oral absorption and plasma clearance of drugs in humans: some new perspectives on the intestinal permeability concept” at Novartis Pharmaceutical Corp., East Hanover, New Jersey, April 30, 1998.
49. A talk on “Prediction of oral absorption and plasma clearance of drugs: some new perspectives on the intestinal permeability concept” at Abbott Laboratories. North Chicago, Illinois, May 29, 1998.
50. A talk on “Drug absorption studies in vivo in rats for predicting fraction of drugs absorbed in humans” in a Workshop on Permeability Definitions and a Regulatory Standards for Bioequivalence” sponsored by AAPS and FDA, Arlington, Virginia, August 17-19, 1998.
51. A talk on “New drug development : prediction of oral absorption and plasma clearance in humans” at G.D. Searle, Skokie, Illinois on October 9, 1998.

52. A talk on "Intestinal uptake and accumulation----a biopharmaceutical perspective" in a Symposium on "Evaluation and Use of Formulation Additives to Enhance the Bioavailability of poorly Absorbed Drugs", at the 1998 Annual AAPS meeting in San Francisco, November 18, 1998.
53. A talk on "A new approach to the prediction of oral absorption and plasma clearance in humans in new drug development" at the Hoffman-La Roche Inc., Nutley, New Jersey, December 2, 1998.
54. A seminar on "Some recent concepts in new drugs development: From in vitro and animal to human studies" at the Department of Medicinal Chemistry and Pharmacognosy, UIC on February 26, 1999.
55. An talk on "Prediction of oral absorption and plasma clearance in humans in early drugs development" at Bevlex Biosciences, Richmond, California on August 18, 1999.
56. A talk on "Drug absorption studies in vivo in rat for predicting fraction of drugs absorbed in humans " in a symposium on "Prediction of Drug Absorption in Man by Animal Experiment" at the World Congress of Pharmacy and Pharmaceutical Sciences (International Pharmaceutical Federation Annual Meeting) in Barcelona, Spain, September -10, 1999.
57. A presentation entitled "New drug development: Prediction of oral absorption and plasma clearance in humans" in a symposium "Pharmacokinetics, Drug Metabolism and Pharmacokinetics" at the 8th Southeast Asia-Western Pacific Region Meeting of Pharmacologists to be held November 1-5, 1999 in Taipei, Taiwan.
58. A talk on the Pharmacokinetics in new drug development, "in a symposium entitled" "Chinese Herbal Medicine Evaluation and Development" Taipei Medical College, Taipei, Taiwan, October 30, 1999.
59. A talk on "Prediction and evaluation of oral absorption in humans and its application in drug development and BA/BE studies," at the Chinese Pharmaceutical Manufacture and Development Association, Taipei, Taiwan, November 1, November 1, 1999.
60. A talk on "Oral absorption prediction, overestimation of gut first-pass metabolism and the role of P-glycoprotein in absorption and hepatic metabolism", at the School of Pharmacy, National Taiwan University, November 2, 1999.
61. A talk on "Prediction and evaluation of oral absorption in humans and its application in drug development and BA/BE studies", at the Bureau of Pharmaceutical Affairs, Department of Health, Taipei, Taiwan, November 2, 1999.
62. A talk on "New perspectives on the role of P-glycoprotein, and the prediction of oral absorption and first-pass metabolism in man", at the Center for Drug Evaluation and Research, Food and Drug Administration, Rockville, Maryland, Dec 6, 1999.
63. Same as above at the Xenobiotic Laboratories, Plainsboro, New Jersey, December 7, 1999.
64. Same as above at the Schering Plough Research Institute, Knilworth, New Jersey, December 8, 1999.

65. Same as above at the College of Pharmacy, University of Michigan. Ann Arbor, Michigan, February 23, 2000.
66. Same as above at the Department of Biomedical and Therapeutic Sciences, College of Medicine, University of Illinois at Chicago, Peoria, IL, March 22, 2000.
67. Same as above at the Roche Bioscience, Palo Alto, California, May 2000.
68. Same as above at the Axys Pharmaceuticals, San Francisco, California, May 2000.
69. Same as above at the School of Pharmacy, University of California, San Francisco, June 2000.
70. A talk on "New perspectives on the role of P-glycoprotein in absorption and metabolism of drugs" at the Bevlex Biosciences, Richard, California, June 2000.
71. A talk on "New perspectives on the role of P-glycoprotein in oral absorption and hepatic metabolism of drugs" at the College of Pharmacy, Rutgers University, August 2000.
72. A talk on "Prediction of oral absorption in humans and the new perspective on the role of p-glycoprotein" at the Oral Bioavailability Breakthrough Workshop held in August 2000 at Aventis Pharmaceuticals, New Jersey.
73. A talk on "Some new perspective on the role of P-glycoprotein in oral absorption and hepatic metabolism" at Abbott Laboratories, Illinois January 25, 2001.
74. A talk on "Prediction of oral absorption in humans and new perspectives on the role of p-glycoprotein" at the Pharmaceutical Industry Technology and Development Center in Taipei on June 14, 2001.
75. The above talk at the Chinese University of Hong Kong School of Pharmacy on June 19, 2001.
76. Delivery of the key-note speech at the graduation ceremony of the National Taiwan University School of Pharmacy on June 16, 2001.
77. A talk on "Use of rat to predict oral absorption, bioavailability and plasma clearance of drugs in humans" at the 2001 National Taiwan University Medical College Alumni Convention in North American, Anaheim, CA, August 5, 2001.
78. Two presentations entitled "Oral absorption and bioavailability in drug discovery and development" at Aventis. New Jersey, December 14, 2001.
79. A talk on "Transport mechanisms of drugs across enterocytes and interspecies relationship in oral absorption" presented to the Taipei Medical University School of Pharmacy on December 16, 2002.
80. The same talk presented to the National Defense Medical University School of Pharmacy in Taipei on December 18, 2002.
81. The same talk presented to the National Taiwan University School of Pharmacy on December 18, 2002.

External Reviewer for Faculty Promotion and Thesis Defense:

1. Faculty promotion for University of California (San Francisco) in 1983 and 1988.
2. Faculty Promotion for the University of Georgia in 1984.
3. Faculty Promotion for the University of Southern California in 1986.
4. Ph.D. thesis defense for the University of Alexandria in 1988.

Reviewer for Manuscripts Submitted to the Following Journals:

Journal of Pharmaceutical Sciences
Journal of Pharmacokinetics and Biopharmaceutics
American Journal of Hospital Pharmacy
Canadian Journal of Pharmaceutical Sciences
Clinical Chemistry
International Journal of Pharmaceutics
Journal of Clinical Pharmacology
Biopharmaceutics and Drug Disposition
Journal of Forensic Sciences
Journal of the Association of Official Analytical Chemists
Journal of Chromatography-Biomedical Applications
International Journal of Clinical Pharmacology and Therapeutics
Journal of Clinical Pharmacy and Therapeutics
Clinical Pharmacokinetics
Journal of Chromatography
Medical Letters
Journal of Pharmacology and Experimental Therapeutics
Journal of Forensic Sciences
Life Science
European Journal of Pharmaceutical Sciences
The Japanese Journal of Pharmacology
Journal of Pharmacy and Pharmacology
Kidney International
European Journal of Medicinal Chemistry

Major Committees Served at the University of Illinois:

College of Pharmacy Executive Committee (1971-72, 1975-76, 1983-87, 1988-90)
Faculty Retreat Committee, College of Pharmacy (1973)
Chairman of the Subcommittee on Administrative Responsibility, College of Pharmacy (1974)
Chairperson of an ad hoc Committee on a Clinical Pharmacokinetics Laboratory, College of Pharmacy (1974)
Research and Graduate Committee, College of Pharmacy (1972, 1974-76)
Academic Standing Committee, College of Pharmacy (1977-79)
Task Force on Graduate Education and Research Committee (1983-85)
University Senate (1972; 1974-77)
Campus Research Board (1975-78)
Graduate College Executive Committee (1972-74)
Committee of Associates on Human Research (1975-76)
Search committees for the Dean of Graduate College (1974), Head of the Department of Pharmacy (1978) and Head of the Department of Pharmacodynamics (1982 and 1986)

Chairman of the Tenure and Promotion Subcommittee, Executive Committee, College of Pharmacy (1988-89)
 Senate Committee on the Honorary Degrees (1976-77)
 Consultation Committee for the Deanship of the Graduate College (1975-77)
 Chair of the Subcommittee on Faculty and Staff of the College of Pharmacy's Strategic Planning (1990)
 Chairman of the ad hoc Tenure and Promotion Committee, College of Pharmacy, (1989-90)
 Chairman, ad hoc Committee on College of Pharmacy Monthly Seminar Program (1991-94)
 Faculty Subcommittee of the Task Force on Cultural Diversity of the University (1991)
 Editor, Faculty Publications, College of Pharmacy, University of Illinois at Chicago (1991)
 Chairperson, 1992 Henniger Lectureship Committee, College of Pharmacy Chairperson, 1992 and 1993 Webster-Sibilsky Lectureship Committee, College of Pharmacy.
 Dean Search Committee, College of Pharmacy, University of Illinois at Chicago, 1994-1995.
 Departmental Graduate Committee member (2000-present)
 Departmental Advisory Committee member (2001).
 Student Disciplinary Committee member of the College of Pharmacy (2000-2002)

Major Courses Taught:

Washington State University:	Pharmaceutics II and Biopharmaceutics
University of Illinois at Chicago:	Biopharmacy; Clinical Pharmacokinetics; Advanced Pharmacokinetics; Lectures in several other courses

Training of Graduate Students and Postdoctorates:

Masters Degree	10 (awarded)
Ph.D. Degree	23 (18 awarded and 5 in current enrollment)
Postdoctorates	12

Grant Review and Consultantships:

1. Pharmacology Study Section of the National Institutes of Health, 1981.
2. On a site-visit team to Northwestern University, November, 1976 for the American Cancer Society
3. Medical Research Council of Canada, (1982-1986).
4. Pharmaceutical companies.
5. Law firms

Publications:

1. W.L. Chiou and S. Riegelman: Disposition kinetics of griseofulvin in dogs. J. Pharm. Sci. 58:1500-1504 (1969).
2. W.L. Chiou and S. Riegelman: Preparation and dissolution characteristics of several fast-release solid dispersions of griseofulvin. J. Pharm. Sci. 58:1505-1510 (1969).
3. W.L. Chiou, S. Riegelman and J.R. Amberg: Complications in using rabbits for the study of oral drug absorption. Chem. Pharm. Bull. 17:2170-2173 (1969).
4. W.L. Chiou and L.D. Smith: Absorption of organic compounds by commercial filter papers and its implications in quantitative-qualitative chemical analysis. J. Pharm. Sci. 59: 843-847 (1970).

5. W.L. Chiou and S. Riegelman: Oral absorption of griseofulvin in dogs: Increased absorption via solid dispersion in polyethylene glycol 6000. J. Pharm. Sci. 59: 937-942 (1970).
6. Review Article: W.L. Chiou and S. Riegelman: Pharmaceutical applications of solid dispersion systems. J. Pharm. Sci. 60: 1281-1301 (1971).
7. W.L. Chiou and L.D. Smith: Solid dispersion approach to the formulation of organic liquid drugs by using polyethylene glycol 6000 as a carrier, J. Pharm. Sci. 60:125-128 (1971).
8. W.L. Chiou and S. Niazi: Phase diagram and dissolution studies of sulfathiazoleurea solid dispersion system. J. Pharm. Sci. 60: 1339-1344 (1971).
9. W.L. Chiou and S. Riegelman: Absorption characteristics of solid dispersed and micronized griseofulvin in man. J. Pharm. Sci. 60: 1376-1380 (1971).
10. W.L. Chiou: Mechanism of increased rates of dissolution and oral absorption of chloramphenicol from chloramphenicol-urea solid dispersion system. J. Pharm. Sci. 60: 1406-1408 (1971).
11. W.L. Chiou and S. Riegelman: Increased dissolution rates of water insoluble cardiac glycosides and steroids via solid dispersions in polyethylene glycol 6000. J. Pharm. Sci. 60: 1569-1571 (1971).
12. W.L. Chiou: An equation to estimate the percent of drug remaining in the body after an intravenous injection. J. Pharm. Pharmacol. 24:343-344 (1972).
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Presentations:

About 130 papers have been presented at various scientific meetings since 1969.

Patents:

S. Riegelman and W.L. Chiou. Solid dispersion of drugs. Canadian patent No. 987588 (29 pages), April 20, 1976.

S. Riegelman and W.L. Chiou. Increasing the absorption rate of insoluble drugs. U.S.A. patent No. 4151273 (10 pages), April 24, 1979.

A patent holder for Gris-PEG (a special ultrafine griseofulvin formulation) originally marketed by Dorsey Laboratories of Sandoz Inc.