Department of

Pharmacology and Toxicology

1999

Annual Report

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I. Executive Summary

The Department of Pharmacology and Toxicology experienced substantial growth during the past year. However, we were saddened by the deaths of **Peter K. Knoefel, M.D.**, Professor and Chair Emeritus of the Department of Pharmacology and Toxicology and **Carlo H. Tamburro**, **M.D., M.P.H.**, Professor of Medicine and Pharmacology/Toxicology and Chief of the Division of Occupational Toxicology. Dr. Peter Knoefel served as the first chairperson of the newly created Department of Pharmacology from 1941-1966, and served as chairman emeritus since 1966. Dr. Carlo Tamburro joined the University of Louisville in 1974 and the Department in 1990 serving as Professor and Chief, Division of Occupational Toxicology since 1990 and Co-Director, Center for Environmental Health Sciences since 1993. Resolutions were adopted by the Department, School of Medicine, and Faculty Senate in honor and appreciation for their service to the University of Louisville, and copies are attached in the appendix.

Faculty recruitment dominated much of the year. A search committee consisting of Dr. David Hein (Chair), Dr. Fred Benz, Dr. Theresa Chen, Dr. Fred Hendler, Dr. James Kang, Dr. Steven Myers, and Dr. Peter Rowell screened applications for three tenure track positions. Following a nationwide search and onsite interviews by several top candidates in the Spring, tenure-track associate professor positions were offered to Jun-Yan Hong, Ph.D., Research Assistant Professor, Laboratory for Cancer Research, Rutgers University, and **J. Christopher States, Ph.D.**, Associate Professor, Institute of Chemical Toxicology, Wayne State University. Dr. States also held appointments as Associate Professor in the Molecular and Cellular Toxicology Ph.D. Program, the Cancer Biology Ph.D. Program, and the Center for Molecular Medicine and Genetics, and was Adjunct Associate Professor in the Department of Pharmaceutical Sciences. Although Dr. Hong was excited about the opportunities available in our Department, professional spouse considerations led him to accept an Associate Professor position (with tenure) at the University of Medicine and Dentistry of New Jersey. However, we are very pleased that Dr. States accepted and transferred a funded research program investigating the molecular biology and molecular genetics of DNA damage and repair in humans. **Zhao-Hui (Joe) Song, Ph.D.**, who was Assistant Professor and Graduate Ph.D. Program Coordinator in the Department of Medical Pharmacology and Toxicology at Texas A&M University School of Medicine was offered and accepted a position as tenure track Assistant Professor. Dr. Song transferred a funded research program focusing on the cloning and molecular/functional characterization of G-protein coupled receptors, and structure-function relationships of cannabinoid receptors.

Following a new faculty search and interviews of the top candidates in the Fall**, W. Glenn McGregor, M.D.**, Research Assistant Professor at Michigan State University College of Medicine was offered and accepted a position as tenure-track Associate Professor effective February, 2000. Dr. McGregor's recruitment was in collaboration with the James Graham Brown Cancer Center and included a joint appointment in the James Graham Brown Cancer Center and the Division of Hematology/Oncology of the Department of Medicine. Dr. McGregor transferred a funded research program investigating the molecular biology of DNA damage, repair and mutagenesis. Each of the three new faculty are housed in new space on the second floor of the Baxter Biomedical Research Building. Placement of their labs in this state-of -the-art interdisciplinary research building will

facilitate interdisciplinary interactions with the James Graham Brown Cancer Center, the Center for Genetics and Molecular Medicine, and the Kosair Children's Research Institute.

David Gozal, M.D. and Evelyne Gozal, Ph.D. were recruited to joint faculty appointments as Professor and Assistant Professor (Research), respectively, in collaboration with the Department of Pediatrics. Dr. David Gozal was Constance S. Kaufman Chair of Pediatric Pulmonary Research, Vice-Chairman for Research, and Professor in the Department of Pediatrics at Tulane University School of Medicine. He also was Director of the Tulane University Comprehensive Sleep Medicine Center. He received multiple appointments at the University of Louisville as well, including Children's Hospital Foundation Chair for Pediatric Research, Vice-Chair for Research, Director of Kosair Children's Hospital Research Institute, and Distinguished University Scholar. Dr. David Gozal transferred funded research programs investigating several interrelated areas, including signal transduction mechanisms underlying molecular and physiological responses to hypoxia and obstructive sleep apnea in children. Dr. Evelyne Gozal was a postdoctoral fellow in the Department of Medicine, Section of Pulmonary Disease, Critical Care, and Environmental Medicine at Tulane University School of Medicine. Her research includes investigation of signal transduction pathways and molecular adaptation mechanisms involved in neuronal cell survival and cell death during hypoxia. Dr. David and Evelyne Gozal's laboratories are housed in the Kosair Children's Hospital Research Institute and the third floor of the Baxter Biomedical Research Building.

Three additional new faculty were appointed to associate and adjunct faculty positions. **Aruni Bhatnagar, Ph.D.**, whose primary appointment is Professor in the Division of Cardiology of the Department of Medicine, was appointed to our associate faculty. Dr. Bhatnagar's funded research program includes oxidative DNA damage and its role in cardiovascular disease and the role of lipid peroxidation in atherosclerosis. **Stuart Horowitz, Ph.D.** was appointed adjunct assistant professor. Dr. Horowitz serves as Director, Research and Technology, Heart and Lung Institute, Jewish Hospital. Dr. Horowitz has research experience and interests into investigations of oxidant-induced cell death and oxidative tissue injury, particularly relating to pulmonary and cardiovascular disease. **Peter Wedlund, Ph.D.** was appointed adjunct associate professor. Dr. Wedlund is Associate Professor in the College of Pharmacy and Adjunct Associate Professor in the Graduate Center for Toxicology at the University of Kentucky. Dr. Wedlund has a well-established research program in pharmacogenetics, with an emphasis towards applications of genetic testing as therapeutic tools in clinical practice.

We are very pleased with the addition of these eight outstanding new faculty and their research programs. They will no doubt contribute substantially to the expansion of research and graduate education activities of the Department, School of Medicine, and the University in the years ahead.

Dr. Leonard Waite retired as Director of the Graduate Program in Pharmacology and Toxicology effective at the end of the year. Dr. Waite led the program with distinction from 1976-1999, a period of over 23 years. Virtually all graduates of our program occurred during his tenure, for which the Department is deeply grateful. A reception to honor Dr. Waite for his service was held at the annual holiday party in December. **Dr. William Pierce**, professor and a graduate of our program (under the mentorship of Dr. Waite), was appointed graduate director effective in January 2000.

The very first graduate of our program, **Dr. James Fisher**, was honored as the School of Medicine's 1999 Alumni Fellow. Dr. Fisher met with Department faculty and students and presented the first Department K. C. Huang Memorial Lecture entitled "Signal transduction pathways in the regulation of erythropoietin production." Dr. Fisher received his Ph.D. in pharmacology from the University of Louisville in 1958 and served as Professor and Chairman of the Department of Pharmacology at Tulane University School of Medicine from 1968 to 1996. In 1987 the Louisiana Board of Regents honored Dr. Fisher with a Regents endowed professorship in pharmacology, and in 1992, Tulane University established a distinguished annual lectureship in his name. The Department is extremely proud of its first graduate who serves as an inspiration to our current faculty and students.

The Department hosted the annual fall meeting of the Ohio Valley Society of Toxicology in November. Approximately 120 scientists from across the Ohio Valley region participated. The meeting included a social day at Churchill Downs and a scientific day at the Baxter Biomedical Research Building. The featured symposium entitled "Genetic susceptibility to environmental toxins" was chaired by Drs. David Hein and Russell Prough. The featured speakers and the titles of their presentations were "Pharmacogenetics and pharmacogenomics: ethnic and genetic differences in toxicity and cancer" by Dr. Daniel W. Nebert, Center for Genetics and Department of Environmental Health, University of Cincinnati; "Genetic susceptibility to colon and pancreatic cancer and the development of high throughput genotyping methods" by Dr. Fred F. Kadlubar, Division of Molecular Epidemiology, National Center for Toxicological Research; "Dioxins, clocks, and oxygen: Prototype signals of an environmental sensor superfamily" by Dr. Chris Bradfield, McArdle Laboratory for Cancer Research, University of Wisconsin-Madison; and "Functional outcome of the interaction between the Ah receptor and the retinoblastoma protein" by Dr. Alvaro Puga, Center for Genetics and Department of Environmental Health, University of Cincinnati. Over 40 research posters were also presented at the meeting.

1999 will forever be associated with "Y2K" as a tremendous amount of effort by faculty and staff (particularly Edie Greca, our Y2K program manager) was required in response to University of Louisville directives to be fully prepared for the year 2000 turnover. Nevertheless, research productivity increased significantly during the year, and the Department contributed significantly towards the University of Louisville's transition to a premier metropolitan research University. The Department of Pharmacology and Toxicology is poised to make even greater contributions in the years ahead.

II. Mission Statement

The Department of Pharmacology and Toxicology is committed to academic excellence and to the attainment of regional, national, and international recognition for the quality of its educational, research, and service activities. Guided by the University of Louisville Challenge for Excellence to become a preeminent metropolitan research university, the Department Strategic Plan will focus on accomplishment of five broad objectives:

- Provide instruction in pharmacology and toxicology of the highest quality for the education and preparation of medical, dental, nursing, and other health care professional students. Emphasis will be placed on the fundamental principles necessary for life-long learning and the essential knowledge required for rational, effective, and safe use of drug therapy.

- Advance biomedical knowledge through active contribution to high quality research and other scholarly activities, particularly in pharmacology and toxicology and other areas of focus within the University of Louisville Challenge for Excellence.

- Provide high quality research and educational experiences in pharmacology and toxicology for the education and training of future biomedical scientists who can provide and advance biomedical education, research, and service.

- Provide instruction of the highest quality in pharmacology and toxicology that is appropriate for students at the undergraduate, graduate, and postgraduate levels.

- Provide high quality service to the School of Medicine, the Health Sciences Center, the University, the people of Louisville and the surrounding region, the Commonwealth of Kentucky, professional organizations, the nation, and the world.

III. Faculty/Research Descriptions (Primary and joint appointments)

George R. Aronoff, M.D. (Indiana University)
Professor

Effects of uremia on drug disposition in humans; drug nephrotoxicity and renal drug metabolism, artificial intelligence.

Frederick W. Benz, Ph.D. (University of Iowa)
Professor

Biochemical pharmacology and toxicology; biochemical mechanisms of drug action and toxicity.

Laurence A. Carr, Ph.D. (Michigan State University)
Professor

Biochemical neuropharmacology; functional role of brain biogenic amines; interaction of brain neurotransmitters with peripheral immune system.

Theresa S. Chen, Ph.D. (University of Louisville)
Professor

Biochemical toxicology; role of glutathione in aging toxicology; general and specific toxicity of environmental pollutants.

Nicholas A. Delamere, Ph.D. (University of East Anglia)
Professor

Electrolyte transport mechanisms in epithelia; second messenger regulation of aqueous humor secretion processes; the role of ion transport mechanisms in preserving transparency of the ocular lens.

David Gozal, M.D. (Hebrew University of Jerusalem)
Professor

Signal transduction mechanisms underlying ventilatory response to hypoxia; neuronal adaptions to intermittent hypoxia: growth factors, intracellular signaling, and genomic implications.

Evelyne Gozal, Ph.D. (University of Southern California)
Assistant Professor

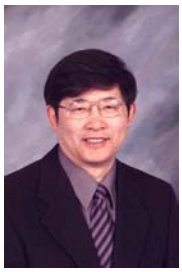
Signal transduction pathways involved in neuronal cell survival and neuronal cell death during hypoxia; cellular mechanisms underlying brain adaptation to chronic and intermittent hypoxia; identification of the kinases and transcription factors activated by hypoxia, leading to gene induction and to adaptation to oxygen deprivation.

David W. Hein, Ph.D. (University of Michigan)
Peter K. Knoefel Professor and Chairman

Molecular pharmacogenetics and epidemiology. Genetic predisposition to cancer and drug toxicity.

Harrell E. Hurst, Ph.D. (University of Kentucky)
Professor

Analytical toxicology and kinetics with emphasis on qualitative and quantitative techniques, including gas chromatography, high pressure liquid chromatography and GC/mass spectrometry.



Y. James Kang, Ph.D. (Iowa State University)
Associate Professor

Molecular and cardiac toxicology. Transgenic and knock-out animal models to study oxidative injury and antioxident systems in the heart. Biological functions and toxicological significance of metallothionein and glutathione in vivo.

Frederick N. Miller, Ph.D. (University of Cincinnati)
Professor

Macromolecular permeability in the microcirculation.

Steven R. Myers, Ph.D. (University of Kentucky)
Associate Professor

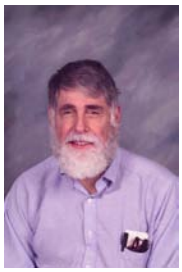
Drug metabolism, metabolism of xenobiotics and chemical carcinogens; use of hemoglobin as biomarker in exposure to xenobiotics.

Donald E. Nerland, Ph.D. (University of Kansas)
Professor

Biochemical toxicology; metabolism of drugs and environmental pollutants.

William M. Pierce, Jr., Ph.D. (University of Louisville)
Professor

Drug design and organ targeting strategies; novel drugs for treatment of osteoporosis; mechanisms of bone formation and resorption; proteomic analysis and study of structure and function of biomolecules and xenobiotics using mass spectrometry.



George C. Rodgers, Jr. M.D., Ph.D. (Yale University, Ph.D.; State University of New York, M.D.)
Professor

Toxicokinetics in drug overdoses and pharmacokinetics in pediatric disease states.

Peter P. Rowell, Ph.D. (University of Florida)
Professor

Neuropharmacology; effect of drugs on brain neurotransmitters and receptors.

Zhao-Hui (Joe) Song, Ph.D. (University of Minnesota)
Assistant Professor

Molecular pharmacology; cloning and functional characterization of novel G protein-coupled receptors; molecular mechanisms of action and structure-function relationships of cannabinoid (marijuana) receptors.

J. Christopher States, Ph.D. (Albany Medical College)
Associate Professor

Molecular biology and molecular genetics of DNA damage and repair in humans

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Janice E. Sullivan, M.D. (University of Minnesota)
Assistant Professor

Clinical pharmacology with a focus on developmental pharmacokinetics and pharmacodynamics.

Leonard C. Waite, Ph.D. (University of Missouri)
Professor

Endocrine pharmacology; mechanism of action of hormones; pharmacological modulation of hormone action; mineral homeostasis.

Walter M. Williams, M.D., Ph.D. (University of Louisville(
Professor

Studies of drug elimination (metabolism and excretion).

John L. Wong, Ph.D. (University of California-Berkeley)
Professor

Biological chemistry; molecular dosimetry in environmental health; preparation of monoclonal antibodies in biomarker studies.

Thom J. Zimmerman, M.D., Ph.D. (University of Illinois, M.D.; University of Florida, Ph.D.)
Professor

Pharmacology of drugs used to treat glaucoma; carbonic anhydrase inhibitors, cholinergic and adrenergic agents.

IV. Personnel

Faculty with Primary Appointments

Benz, Frederick W., Professor; Ph.D., Pharmacology, University of Iowa (1970).

Carr, Laurence A., Professor; Ph.D., Pharmacology, Michigan State University (1969).

Chen, Theresa S., Professor; Ph.D., Pharmacology, University of Louisville (1971).

Hein, David W., Peter K. Knoefel Professor and Chair; Ph.D., Pharmacology, University of Michigan (1982).

Hurst, Harrell E., Professor; Ph.D., Toxicology, University of Kentucky (1978).

Myers, Steven R., Associate Professor; Ph.D., Pharmacology, University of Kentucky (1986).

Nerland, Donald E., Professor; Ph.D., Medicinal Chemistry, University of Kansas (1974).

Pierce, William M., Jr., Professor; Ph.D., Pharmacology and Toxicology, University of Louisville (1981).

Rowell, Peter P., Professor; Ph.D., Pharmacology and Therapeutics, University of Florida (1975).

Song, Zhao-Hui (Joe), Assistant Professor; Ph.D., Pharmacology, University of Minnesota (1992).

States, J. Christopher, Associate Professor; Ph.D., Molecular Biology and Pathology, Albany Medical College/Union University (1980).

Waite, Leonard C., Professor and Vice Chairman; Ph.D., Pharmacology, University of Missouri (1969).

Williams, Walter M., Professor; Ph.D., Pharmacology, University of Louisville (1970); M.D., University of Louisville (1974).

Faculty with Joint Appointments

Aronoff, George R., Professor of Medicine, and Pharmacology and Toxicology; M.D., Indiana University (1975).

Delamere, Nicholas A., Professor of Ophthalmology and Visual Sciences, and Pharmacology and Toxicology; Ph.D., Membrane Physiology and Biophysics, University of East Anglia, Norwich, England (1976).

Gozal, David, Professor of Pediatrics, and Pharmacology and Toxicology; M.D., Hebrew University of Jerusalem, Hadassah Medical School (1979).

Gozal, Evelyne, Assistant Professor (Research) of Pediatrics, and Pharmacology and Toxicology (Research); Ph.D., Toxicology, University of Southern California (1997).

Kang, Y. James, Associate Professor of Medicine, and Pharmacology and Toxicology; Ph.D., Cell Biology and Zoology, Iowa State University (1989).

Miller, Frederick N., Professor of Physiology and Biophysics, and Pharmacology and Toxicology; Ph.D., Pharmacology, University of Cincinnati (1971).

Rodgers, George C., Jr., Professor of Pediatrics, and Pharmacology and Toxicology; Ph.D., Organic Chemistry, Yale University (1964); M.D., State University of New York (1975).

Sullivan, Janice E., Assistant Professor of Pediatrics, and Pharmacology and Toxicology; M.D., University of Minnesota (1988).

Wong, John L., Professor of Chemistry, and Pharmacology and Toxicology; Ph.D., Chemistry, University of California at Berkeley (1966).

Zimmerman, Thom J., Professor and Chairman of Ophthalmology and Visual Sciences, and Pharmacology and Toxicology; Ph.D., Pharmacology, University of Florida (1976); M.D., University of Illinois (1968).

Faculty with Associate Appointments

Bhatnagar, Aruni, Professor of Medicine; Ph.D., Chemistry, University of Kanpur, India (1986).

Brier, Michael E., Associate Professor of Medicine; Ph.D., Industrial and Physical Pharmacy, Purdue University (1986).

Edmonds, Harvey L., Professor of Anesthesiology; Ph.D., Pharmacology, University of California at Davis (1974).

Jumblatt, James E., Professor of Ophthalmology and Visual Sciences; Ph.D., Biological Sciences, Columbia University (1975).

Lang, Calvin A., Professor of Biochemistry and Molecular Biology; Sc.D., Biochemistry and Nutrition, Johns Hopkins University (1954)

Rigor, Benjamin, Professor of Anesthesiology; M.D., University of the East Ramon Magsaysay Memorial Medical Center (1962).

Ross, Mitchell P., Associate Professor of Pediatrics; M.D., Oregon Health Sciences University (1985).

Schurr, Avital, Professor of Anesthesiology; Ph.D., Biochemical Pharmacology, Ben Gurion University, Beer Sheva, Israel (1977).

Faculty with Emeritus Appointments

Dagirmanjian, Rose, Professor Emerita; Ph.D., University of Rochester (1960).

Darby, Thomas D., Adjunct Professor Emeritus; Ph.D., Medical College of South Carolina (1957).

Jarboe, Charles H., Professor Emeritus; Ph.D., University of Louisville (1956).

Scharff, Thomas G., Professor Emeritus; Ph.D., University of Rochester (1956).

Waddell, William J., Professor and Chair Emeritus; M.D., University of North Carolina (1955).

Faculty with Adjunct Appointments

Epstein, Paul N., Adjunct Associate Professor of Pharmacology and Toxicology; Ph.D., Baylor College of Medicine (1981).

Friedman, Marvin A., Adjunct Professor of Pharmacology and Toxicology; Ph.D., Massachusetts Institute of Technology (1967).

Gruber, Scott A., Adjunct Associate Professor of Pharmacology and Toxicology; M.D., SUNY Downstate Medical School (1983); Ph.D., University of Minnesota (1991).

Hayes, A. Wallace, Adjunct Professor of Pharmacology and Toxicology; Ph.D., Auburn University (1967).

Holthouser, Michael G., Adjunct Assistant Professor of Pharmacology and Toxicology; M.D., University of Kentucky (1971).

Horowitz, Stuart, Adjunct Assistant Professor of Pharmacology and Toxicology; Ph.D., University of Rochester (1986).

Lewis, Richard, Adjunct Assistant Professor of Pharmacology and Toxicology; M.D., Case Western Reserve University (1980).

Matyunas, Nancy, Adjunct Instructor of Pharmacology and Toxicology; Pharm.D., University of Utah (1983).

Nicholson, John A., Adjunct Assistant Professor of Pharmacology and Toxicology; D.M.D., University of Louisville (1979); Ph.D., University of Louisville (1968).

Wedlund, Peter A., Adjunct Associate Professor of Pharmacology and Toxicology; Ph.D., Pharmaceutical Sciences, University of Washington (1981).

Woodcock, Thomas M., Adjunct Professor of Pharmacology and Toxicology; M.D., Columbia University (1970).

New Faculty Appointments

Bhatnagar, Aruni, Ph.D., Professor (associate appointment), effective October 1

Gozal, David, M.D., Professor (joint appointment), effective October 1

Gozal, Evelyne, Ph.D., Assistant Professor (Research; joint appointment), effective November 1

Horowitz, Stuart, Ph.D. Adjunct Assistant Professor, effective October 1

Song, Zhao-Hui (Joe), Ph.D., Assistant Professor, effective August 16

States, J. Christopher, Ph.D., Associate Professor, effective September 1

Staff

Carpenter, Sharon; Executive Secretary

Clark, Denny, Lab Tech III; Therapeutics and Toxicology Laboratory

Corbett, Donna; Lab Tech III

Doll, Mark; Research Associate

Emery, Nicole; Lab Tech III

Greca, Edie; Business Manager III

Lewis, Stephanie; Lab Research Technician III

Lippmann, Melanie; Lab Research Technician III

Rich, Alexis; Student Assistant

Rutledge, Rachel; Student Assistant

Rubin-Teitel, Heddy; Program Assistant III

Smith, Ned; Senior Research Technologist

Srinivasan, Chandrika, Ph.D., Student Assistant

Volk, Kelly; Lab Research Technician III

Graduate Students

Doctoral Program

Brewer, Bradley G.
Cai, Jian
Campian, Cristian
Elsherif, Laila
Fretland, Adrian
Fu, Xin
Hartford, April
Hennion, John
Hou, Yining
Jacobs, Al (Chip)
Lambert, Jason
Lau, Joann
Leff, Matthew
Li, Junyu
Nangju, Norma
Neale, Jason
Payne, Scot
Porter, Paul
Spinnato, Joe
Sun, Xichun

Masters Program

Melo, Nicolas

Postdoctoral Fellows

Cai, Jian
Devanaboyina, Udaya-sankar
Leff, Matthew
Meng, Xianweng
Wang, Guang-wu
Wang, Ju-Feng
Wu, Huiyun
Webb, Stephanie
Webster, Rose
Xiao, Gong H.
Zhou, Zhan-Xiang
Zhao, Shuang
Zhong, Miao

Division of Occupational Toxicology

(transferred to Department of Medicine, effective July 1, 1999)

Canchis, Willie, M.D.; Research Fellow

Cho, Lori; Student Assistant

Crawford, Robert; Student Assistant

Fortwengler, Philip; Manager, Medical Surveillance

Hiser, Melissa; Clerical Specialist III

Matthews, Sherri; Executive Secretary

Miller, Barbara L., B.S.N., M.S.; Senior Clinical Research Coordinator

Morgenson, Melissa; Secretary

O'Connell, Kathleen, Ph.D.; Research Facilitator

Redferin, Lauren; Student Assistant

Reynolds, Eva; Receptionist

Reynolds, Lark; Program Assistant III

Sherrill, Mike; Student Assistant

Tamburro, Carlo H., M.D, M.P.H.; Division Chief

Wedlund, Peter J., Ph.D., Adjunct Associate Professor, effective October 1

New Graduate Student Appointments

Campian, Christian
Elsherif, Laila
Hou, Yining
Lau, Joann
Porter, Paul

Graduations

Cai, Jian, Ph.D. (awarded May 1999). Advisor: Harrell E. Hurst, Ph.D. Dissertation title: N-(carboxymethyl) Valine Adduct in Hemoglobin: A Biomarker of Advanced Glycation End Product Formation and Oxidative Stress.

Leff, Matthew, Ph.D. (awarded May 1999). Advisor: David W. Hein, Ph.D. Dissertation title: Molecular Genetics of N-acetyltransferases and Prostate Cancer.

Li, Junyu, Ph.D. (awarded May 1999). Advisor: Frederick W. Benz, Ph.D. Dissertation title: Acrylonitrile Acute Intoxication: Toxicodynamics and the Effect of Antidotes.

Melo, Nicolas, M.S. (awarded June 1999). Advisor: Walter M. Williams, M.D., Ph.D. Thesis title: Prevention of Acetaminophen-induced Hepatotoxicity by S-(2-hydroxyethylmercapto)-L-cysteine.

Spinnato, Joseph A., III, Ph.D. (awarded August 1999). Advisor: Steven R. Myers, Ph.D. Dissertation title: Microsomal Metabolism and Tissue Distribution of N-Methyl-N-2,4,6-Tetranitroaniline (Tetryl).

V. Publications (salaried faculty and staff)

Papers

1. Bandla HP, Hopkins RL, Beckerman RC, and **Gozal D** (1999) Pulmonary risk factors compromising postoperative recovery after surgical repair for congenital heart disease. *Chest* **116**:740-747.

2. **Cai J** and **Hurst HE** (1999) Identification and quantitation of N-(carboxymethyl)valine adduct in hemoglobin by gas chromatography/mass spectrometry. *J. Mass Spectrom.* **34**:537-543.

3. Chen D, **Waite LC**, and **Pierce WM, Jr.** (1999) In vitro effects of zinc on markers of bone formation. *Biol. Trace Elem. Res.* **68**:225-234.

4. Czapla MA, Simakajornboon N, Holt GA, and **Gozal D** (1999) Tyrosine kinase inhibitors modulate the ventilatory response to hypoxia in the conscious rat. *J. Appl. Physiol.* **87**:363-369.

5. Davis CD, Feng Y, **Hein DW**, and Finley JW (1999) The chemical form of selenium influences 3,2'-dimethyl-4-aminobiphenyl-DNA adduct formation in rat colon. *J. Nutr.* **129**:63-69.

6. Feng Y, Finley JW, Davis CD, Becker WK, **Fretland AJ**, and **Hein DW** (1999) Dietary selenium reduces the formation of aberrant crypts in rats administered 3,2'-dimethyl-4-aminobiphenyl. *Toxicol. Appl. Pharmacol.* **157**:36-42.

7. Feng Y, Rustan TD, **Fretland AJ**, Cooley AM, Lee KJ, Becker WK, and **Hein DW** (1999) Screening method for urinary bladder tumor detection in the Syrian hamster. *Toxicol. Method* **9**:91-95.

8. **Gozal D** and Thiriet P (1999) Respiratory muscle training in neuromuscular disease: long-term effects on strength and load perception. *Med. Sci. Sports Exerc.* **31**:1522-1527.

9. **Gozal D** and Harper RM (1999) Novel insights into congenital hypoventilation syndrome. *Curr. Opin. Pulm. Med.* **5**:335-338.

10. **Gozal D** (1999) ATS consensus statement - Cardiorespiratory sleep studies in children: establishment of normative data and polysomnographic predictors of morbidity. *Am. J. Respir. Crit. Care Med.* **160**:1381-1387.

11. **Gozal D** (1999) Finding genetic mechanisms in syndromes of of sleep disordered breathing. *American Thoracic Society Position Paper*.

12. **Hennion JP** and El-Mallakh R (1999) The genetics of biopolar disorder. *Louisville Medicine* **47**:336-337.

13. Hulla JE, Miller MS, Taylor JA, **Hein DW**, Furlong CE, Omiecinski CJ, and Kunkel TA (1999) Symposium overview: The role of genetic polymorphisms and repair deficiencies in environmental disease. *Toxicol. Sci.* **47**:135-143.

14. Jiang W, Feng Y, and **Hein DW** (1999) Higher DNA adduct levels in urinary bladder and prostate of slow acetylator inbred rats administered 3,2'-dimethyl-4-aminobiphenyl. *Toxicol. Appl. Pharmacol.* **156**:187-194.

15. **Kang YJ** (1999) The antioxidant function of metallothionein in the heart. *Proc. Soc. Exp. Biol. Med.* **222**:263-273.

16. **Kang YJ**, Li G, and Saari JT (1999) Metallothionein inhibits ischemia-reperfusion injury in mouse heart. *Am. J. Physiol.* **276**:H993-H997.

17. **Leff MA**, **Fretland AJ**, **Doll MA**, and **Hein DW** (1999) Novel human N-acetyltransferase 2 alleles that differ in mechanism for slow acetylator phenotype. *J. Biol. Chem.* **274**:34519-34522.

18. **Leff MA**, Epstein PN, **Doll MA**, **Fretland AJ**, **Devanaboyina US**, Rustan TD, and **Hein DW** (1999) Prostate-specific human N-acetyltransferase 2 (NAT2) expression in the mouse. *J. Pharmacol. Exp. Ther.* **290**:182-187.

19. Li MM, **Payne RS**, Reid KH, Tseng MT, Rigor BM, and Schurr A (1999) Correlates of delayed neuronal damage and neuroprotection in a rat model of cardiac-arrest-induced cerebral ischemia. *Brain Res.* **826**:44-52.

20. **Myers SR**, Pinorini-Godley MT, Reddy TV, Daniel FB, and Reddy G (1999) Gas chromatographic and mass spectrometric determination of hemoglobin adducts of 1,3 dinitrobenzene and 1,3,5-trinitrobenzene in shrew (cryptotis parva). *Int. J. Toxicol.* **18**:317-325.

21. Nakai Y, Dean WL, **Hou Y**, and Delamere NA (1999) Genistein inhibits the regulation of active sodium-potassium transport by dopaminergic agonists in nonpigmented ciliary epithelium. *Invest. Ophthalmol. Vis. Sci.* **40**:1460-1466.

22. **Rowell PP** and Larson BT (1999) Ergocryptine and other ergot alkaloids stimulate the release of [3H]dopamine from rat striatal synaptosomes. *J. Anim. Sci.* **77**:1800-1806.

23. Schurr A, **Payne RS**, Tseng MT, Miller JJ, and Rigor BM (1999) The glucose paradox in cerebral ischemia. New insights. *Ann. N.Y. Acad. Sci.* **893**:386-390.

24. Schurr A, **Payne RS**, Miller JJ, and Rigor BM (1999) Study of cerebral energy metabolism using the rat hippocampal slice preparation. *Methods* **18**:117-126.

25. Schurr A, Miller JJ, **Payne RS**, and Rigor BM (1999) An increase in lactate output by brain tissue serves to meet the energy needs of glutamate-activated neurons. *J. Neurosci.* **19**:34-39.

26. Singleton DW, Lei XD, **Webb SJ**, Prough RA, and Geoghegan TE (1999) Cytochrome P-450 mRNAs are modulated by dehydroepiandrosterone, nafenopin, and triiodothyronine. *Drug Metab. Dispos.* **27**:193-200.

27. Song H, Lang CA, and **Chen TS** (1999) The role of glutathione in p-aminophenol-induced nephrotoxicity in the mouse. *Drug Chem. Toxicol.* **22**:529-544.

28. **Song ZH**, Slowey CA, Hurst DP, and Reggio PH (1999) The difference between the CB(1) and CB(2) cannabinoid receptors at position 5.46 is crucial for the selectivity of WIN55212-2 for CB(2). *Mol. Pharmacol.* **56**:834-840.

29. **Waddell WJ** (1999) Toxicologic considerations in the diagnosis of occupational asthma. *Ann. Allergy Asthma Immunol.* **83**:618-623.

30. Walker JF, Collins LC, Goldsmith J, Moffatt RJ, **Rowell PP**, and Stamford BA (1999) The effect of smoking on energy expenditure and plasma catecholamine and nicotine levels during physical activity. *Nicotine and Tobacco Research* **1**:365-370.

31. Wang GW and **Kang YJ** (1999) Inhibition of doxorubicin toxicity in cultured neonatal mouse cardiomyocytes with elevated metallothionein levels. *J. Pharmacol. Exp. Ther.* **288**:938-944.

32. Wang GW, Schuschke DA, and **Kang YJ** (1999) Metallothionein-overexpressing neonatal mouse cardiomyocytes are resistant to H2O2 toxicity. *Am. J. Physiol.* **276**:H167-H175.

33. **Webb SJ**, Nicholson D, Bubb VJ, and Wyllie AH (1999) Caspase-mediated cleavage of APC results in an amino-terminal fragment with an intact armadillo repeat domain. *FASEB J.* **13**:339-346.

34. Zheng W, Deitz AC, Campbell DR, Wen W-Q, Cerhan JR, Sellers TA, Folsom AR, and **Hein DW** (1999) N-acetyltransferase 1 genetic polymorphism, cigarette smoking, well-done meat intake, and breast cancer risk. *Cancer Epidem. Biomarker. Prev.* **8**:233-239.

Additional Publications of Faculty with Joint Appointments

1. Okafor M, Dean WL, and **Delamere NA** (1999) Thrombin inhibits active sodium-potassium transport in porcine lens. *Invest. Ophthalmol. Vis. Sci.* **40**:*2033-2038*

2. Chin S and **Delamere NA** (1999) Stimulation of active sodium-potassium transport by hydrogen peroxide in cultured rabbit nonpigmented ciliary epithelium. *Curr. Eye Res.* **18**:254-260.

3. Kuwahara S, Chin S and **Delamere NA** (1999) Partial inhibition of Na, K-ATPase activity in cultured rabbit non-pigmented ciliary epithelium following an episode of cytoplasmic ATP depletion. *Act. Physiol. Scand.* **164**:13-20.

4. Yoshidome H, Lentsch AB, Cheadle WG, **Miller FN**, and Edwards MJ (1999). Enhanced pulmonary expression of CXC chemokines during hepatic ischemia/reperfusion induced lung injury in mice. *J. Surg. Res.* **81**:33-37.

5. Heinzelmann M, Platz A, Flodgaard H., Polk HC Jr., and **Miller FN** (1999). Endocytosis of heparin-binding protein (CAP37) is essential for the enhancement of lipopolysaccharide-induced TNF-alpha production in human monocytes. *J. Immunol.* **162**:4240-4250.

6. Lominadze DG, Saari JT, **Miller FN**, Catalfamo JL, and Schuschke DA (1999). In vitro Platelet adhesion to endothelial cells at low shear rates during copper deficiency. *J. Trace Elem. Exp. Med.* **12**:25-36.

7. EhringerWD and **Miller FN** (1999). A new continuous monitoring system for simultaneous measurements of intracellular calcium and either endothelial permeability or leukocyte extravasation. *Inflamm. Res.* **48**:393-398.

8. Lentsch A, **Miller FN**, and Edwards MJ (1999). Mechanisms of leukocyte-mediated tissue injury induced by interleukin-2. *Cancer Immunol. Immunother.* **47**:243-248.

9. Schuschke DA, Percival SS, Saari JT, and **Miller FN** (1999). Relationship between dietary copper concentration and vasodilation in the microcirculation of rats. *BioFactors* **10**:321-327.

10. Ehringer WD, Yamany S, Steier K, Farag A, Roisen FJ, Dozier A, and **Miller FN** (1999). Quantitative image analysis of F-actin in endothelial cells. *Microcirculation* **6**:291-303.

11. **Rodgers GC** and Matyunas NJ (1999). The Pharmacologic Basis of Drug Therapy. *In:* Oski's Pediatric Principals and Practice, 3rd ed. Lippincott.

13. **Rodgers GC** and Matyunas NJ (1999). Chemical and Drug Poisoning. *In:* Behrman RE, et al., eds. Nelson Textbook of Pediatrics, 16th ed. W.B. Saunders Company.

14. **Sullivan JE** (1999). Hypermagnesemia in a 4-week-old infant. *Intensive Thoughts* **1**:5.

15. **Wong JL**, Liu AH, Tian M, and Jin WR (1999). Subspeciaton of sulfidic nickel in particulate. Determination of Ni_3S_2, NiS_2, and NiS in reference and fly ash samples by carbon paste electrode voltammetry. *Fresenius J. Anal. Chem.* **363**:571-572.

16. **Wong, JL** (1999). Subspeciation of sulfidic nickel in fly ash. EPRI Report.

17. Soltau JB and **Zimmerman TJ** (1999). New surgical procedures for glaucoma: nonpenetrating filtering surgery. *Mediguide to Ophthalmology* **8**(4):1-5.

18. Soltau JB and **Zimmerman TJ** (1999). New surgical procedures for glaucoma. *Ophthalmology Digest* **5**:6-8.

VI. Abstracts (salaried faculty and staff)

1. **Li J**, **Benz FW**, **Pierce WM**, Feldhoff RC, and **Nerland DE**. Identification of the predominant site of covalent binding of acrylonitrile to rat hemoglobin. *Toxicological Sciences* **48**: No1-Supplement, 158, 1999.

2. **Chen TS**, **Corbett D**, **Li J**, and **Benz FW**. Effect of chronic acrylonitrile administration on glutathione status in rats. *Toxicologist* **48**: 391, 1999.

3. Srinivasan C, **Chen TS**, Nagasawa HT, and **Williams WM**. *n*-Propylthiazolidine carboxylic acid (PTCA) stimulation of hepatic glutathione (GSH) recovery after depletion by diethylmaleate (DEM) in the rat. *Toxicologist* **48**:391, 1999.

4. Deitz AC, Zheng W, **Leff MA**, Gross M, **Xiao G-h**, **Doll MA**, Wen W-Q, Folsom AR, and **Hein DW**. N-acetyltransferase-2 (NAT2) acetylation polymorphism, well-done meat intake, and breast cancer risk among post-menopausal women. *Proceedings of the American Association for Cancer Research* **40**:148, 1999.

5. **Leff MA**, **Doll MA**, **Fretland AJ**, Ashmun MD, and **Hein DW**. Pre-translational regulation of recombinant human N-acetyltransferase 2 (NAT2) allelic variants in yeast: Identification and characterization of three novel alleles. *Proceedings of the American Association for Cancer Research* **40**:468-469, 1999.

6. **Fretland AJ**, **Leff MA**, **Doll MA**, and **Hein DW**. Functional analysis of single nucleotide substitutions in the human *NAT2* gene in a yeast expression system. *Proceedings of the American Association for Cancer Research* **40**:469, 1999.

7. **Hein DW**. Genetic susceptibility to cancer: Role of the acetylation polymorphisms. *Proceedings of the Midwest Regional Chapter of the Society of Toxicology*, Lincolnshire, Illinois, 1999.

8. **Hein DW**. N-Acetyltransferases-genetics and role in toxicology. *Toxicology Letters* **109** (Suppl. 1):p. 13, 1999.

9. **Hein DW**. Erratum: Symposium Overview: The role of genetic polymorphisms and repair deficiencies in environmental disease. *Toxicological Sciences* **51**:317, 1999.

10. O'Neil WM, Drobitch RK, MacArthur RD, Farrough MJ, **Doll MA**, **Fretland AJ**, **Hein DW**, Crane LR, and Svensson CK. Discordance in caffeine acetylator phenotype and that determined by dapsone or NAT2 genotype in AIDS patients. *Proceedings of the Ninth North American ISSX Meeting*, Vol. **15**:132, 1999.

11. **Xiao GH**, **Doll MA**, **Fretland AJ**, **Webb SJ**, and **Hein DW**. Recombinant expression of rat, hamster and mouse N-acetyltransferase 2 (NAT2) rapid and slow acetylator phenotypes in yeast. *Proceedings of the Ninth North American ISSX Meeting,* Vol. **15**:130, 1999.

12. Deitz AC, **Hein DW**, Hayes RB, Rothman N, Chow W, Zheng W, and Rebbick TR. Effect of biomarker misclassification: Comparison of two N-acetyltransferase 2 (NAT2) genotyping methods. *American Journal of Human Genetics* **65**:A200, 1999.

13. Feng Y, **Fretland AJ**, Rustan TD, Becker AM, Becker WK, and **Hein DW**. Formation of colonic aberrant crypt foci by 3,2′-dimethyl-4-aminobiphenyl in rapid and slow acetylator congenic hamsters requires metabolic activation by CYP1A1 and NAT2. *Proceedings of the Ohio Valley Society of Toxicology,* Louisville, Kentucky, 1999.

14. **Fu X**, **Chen TS**, **Hein DW**, and **Williams WM**. p-Aminophenol-induced hepatoxicity in hamsters. *Proceedings of the Ohio Valley Society of Toxicology,* Louisville, Kentucky, 1999.

15. **Nangju NA**, **Doll MA**, **Xiao GH**, **Devanaboyina U**, **Fretland AJ**, and **Hein DW**. Metabolic activation of 2-hydroxy-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (N-OH-PhIP) by mammary epithelial cells derived from rapid and slow acetylator Syrian hamsters congenic at the *NAT2* locus. *Proceedings of the Ohio Valley Society of Toxicology,* Louisville, Kentucky, 1999.

16. **Hein DW**, **Leff MA**, Ishibe N, Sinha R, Berlot J, Frame J, Frazier HA, and Caporaso NE. Glutathione-S-transferase polymorphism is associated with increased prostate cancer risk. *Proceedings of the Ohio Valley Society of Toxicology,* Louisville, Kentucky, 1999.

17. **Fretland AJ**, Purewal M, Velasco M, Wargovich MJ, and **Hein DW**. 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine induces a higher number of aberrant crypt foci in rapid versus slow acetylator inbred rats. *Proceedings of the Ohio Valley Society of Toxicology,* Louisville, Kentucky, 1999.

18. **Fretland AJ**, **Leff MA**, **Doll MA**, and **Hein DW**. Functional characterization of the eleven single nucleotide polymorphisms in human N-acetyltransferase 2. *Proceedings of the Ohio Valley Society of Toxicology,* Louisville, Kentucky, 1999.

19. **Webb SJ**, **Xiao GH**, and **Hein DW**. Real-time quantitative RT-PCR analysis of *NAT1* and *NAT2* mRNA expression in hamster. *Proceedings of the Ohio Valley Society of Toxicology,* Louisville, Kentucky, 1999.

20. **Xiao GH**, **Doll MA**, **Fretland AJ**, **Webb SJ**, and **Hein DW**. Recombinant expression of rat, hamster, and mouse N-acetyltransferase 2 rapid and slow acetylator phenotypes in yeast. *Proceedings of the Ohio Valley Society of Toxicology,* Louisville, Kentucky, 1999.

21. **Hein DW**, **Leff MA**, Ishibe N, Rashmi S, Berlot J, Frame J, Frazier HA, and Caporaso NE. Glutathione-S-transferase polymorphism is associated with increased prostate cancer risk. *Proceedings of Research!Louisville 1999*.

22. **Xiao GH**, **Doll MA**, **Fretland AJ**, **Webb SJ** and **Hein DW**. Recombinant expression of rat, hamster and mouse N-acetyltransferase 2 rapid and slow acetylator phenotypes in yeast. *Proceedings of Research!Louisville 1999*.

23. **Fretland AJ**, **Leff MA**, **Doll MA**, and **Hein DW**. Functional characterization of the eleven single nucleotide polymorphisms in human N-acetyltransferase 2. *Proceedings of Research!Louisville 1999*.

24. **Webb SJ**, **Xiao GH**, and **Hein DW**. Real-time quantitative RT-PCR of *NAT1* and *NAT2* mRNA expression in hamster. *Proceedings of Research!Louisville 1999*.

25. **Fu X**, **Chen TS**, **Hein DW** and **Williams WM**. p-Aminophenol-induced hepatotoxicity in hamsters. *Proceedings of Research!Louisville 1999*.

26. **Cai J** and **Hurst HE**. GC/MS investigation of glyoxal formation from glucose: Role of reactive oxygen species. Abstract Log Number 484 presented at the *47th ASMS Conference on Mass Spectrometry and Allied Topics*, Dallas, TX, June 13-17, 1999.

27. **Cai J** and **Hurst HE**. GC/MS investigation of glyoxal formation from glucose: Role of reactive oxygen species. Abstract PRF2 presented by Jian Cai, Ph.D. at *Research!Louisville Postgraduate Research Day*, November 18, 1999.

28. **Kang YJ**. Antioxidant functions of metallothionein. Plenary Lecture at the 6th Annual Meeting of the Oxygen Society, New Orleans, LA. *Free Radical Biology and Medicine* 27 (Supplement 1):S9, 1999.

29. **Kang YJ**, Wu H-Y, and Saari JT. Suppression of copper deficiency-induced hypertrophy in metallothionein overexpressing transgenic mouse hearts. *FASEB Journal* 13:A371, 1999.

30. **Kang YJ** and Wang G-W. Inhibition of doxorubicin-induced apoptosis in metallothionein overexpressing transgenic mouse heart. *Toxicological Science (Toxicologist)* 48 (1-S):156, 1999.

31. Wang G-W, Zhou Z, Klein JB, and **Kang YJ**. Inhibition of apoptosis by hypoxia/reoxygenation in metallothionein overexpressing cardiomyocytes. Presented at the 6th Annual Meeting of the Oxygen Society, New Orleans, LA. *Free Radical Biology and Medicine* 27 (Supplement 1):S117, 1999.

32. Zhou Z, and **Kang YJ**. Age-related myocardial apoptosis is inhibited by metallothionein in mice. Presented at the 6th Annual Meeting of the Oxygen Society, New Orleans, LA. *Free Radical Biology and Medicine* 27 (Supplement 1):S47, 1999.

33. Klein JB, Zhou Z, Wang G-W, Buridi A, and **Kang YJ**. TNF-α stimulates cardiomyocyte apoptosis by a p38 MAPK pathway that requires reactive oxygen species. Presented at the 6th Annual Meeting of the Oxygen Society, New Orleans, LA. *Free Radical Biology and Medicine* **27** (Supplement 1):S114, 1999.

34. Chen CJ, Wu H-Y, and **Kang YJ**. Protection by zinc against acute ethanol hepatotoxicity and its relation to metallothionein production. *Toxicological Sciences (Toxicologist)* 48 (1-S):197, 1999.

35. **Myers SR**, Grubbs CJ, and Lubet RA. Qualitative and quantitative determination of 7,12-dimethylbenz(a)anthracene (DMBA) hemoglobin (Hb) adducts. *Toxicologist* 48:1-S, #56, page 12, 1999.

36. **Myers SR**, Grubbs CJ, and Lubet RA. Qualitative and quantitative characterization of 7,12-dimethylbenz(a)anthracene (DMBA) hemoglobin (Hb) adducts. *Proceedings for the American Association for Cancer Research* 40, Abstract #301, page 45, March 1999.

37. Pinorini-Godly MT, **Myers SR**, Kemper RA, Reddy TV, Daniel FB, and Reddy G. Determination of hemoglobin adducts of 1,3-dinitrobenzene and 1,3,5-trinitrobenzene in least shrew (cryptotis parva). *Proceedings for the American Association for Cancer Research* 40, Abstract #324, page 48, March 1999.

38. Ross MP and **Myers SR**. 4-Aminobiphenyl hemoglobin adducts in maternal and fetal blood: Role of passive smoke exposure on the fetus. *Proceedings for the American Association for Cancer Research* 40, Abstract #1402, page 212, March 1999.

39. **Spinnato JA**, and **Myers SR**. Elimination and distribution of tetryl following subcutaneous administration in the male Sprague-Dawley rat. *Toxicologist* 48:1-S, #989, page 210, 1999.

40. Ross MP and **Myers SR**. 4-aminobiphenyl (4ABP) hemoglobin (Hb) adducts in maternal smokers: Role of passive smoke exposure on the fetus. *Toxicologist* 48:1-S, #1227, page 260, 1999.

41. **Myers SR**, Pinorini-Godly MT, Kemper RA, and Byrdwell C. Metabolic Activation of Polycyclic Aromatic Hydrocarbons via Methyl Substitution Reactions. *The 17th International Symposium on Polynuclear Aromatic Hydrocarbons*, Palais des Congrés, Université de Bordeaux, Bordeaux, France, October 25-29, 1999.

42. Pinorini-Godly MT, **Spinnato JA**, Boles B, Cook C, and **Myers SR**. Characterization of 4-Aminobiohenyl Hemoglobin Adducts in Maternal and Fetal Blood. *The 17th International Symposium on Polynuclear Aromatic Hydrocarbons*, Palais des Congrés, Université de Bordeaux, Bordeaux, France, October 25-29, 1999.

43. **Spinnato JA**, **Myers SR**, Pinorini-Godly MT, Cook C, and Boles B. Quantitative analysis of benzo(a)pyrene hemoglobin (hb) adducts in maternal and fetal blood obtained from smokers and nonsmokers. *The 17th International Symposium on Polynuclear Aromatic Hydrocarbons*, Palais des Congrés, Université de Bordeaux, Bordeaux, France, October 25-29, 1999.

44. **Myers SR**, Pinorini-Godly MT, Reddy TV, Daniel FB, and Reddy G. Gas Chromatographic and Mass Spectrometric Determination of Hemoglobin Adducts of 1,3-Dinitrobenzene and 1,3,5-Trinitrobenzene in Shrew (cryptotis parva). *The 17th International Symposium on Polynuclear Aromatic Hydrocarbons*, Palais des Congrés, Université de Bordeaux, Bordeaux, France, October 25-29, 1999.

45. **Myers SR**, Song LL, Lantvit D, Lubet RA, Steele V, Kelloff GJ, Moon RC, and Pezzuto J. Chemoprevention of DMBA Induced Mammary Carcinogenesis: Relationship Between Induction of Phase II Enzymes, Effeccts on DMBA Induced Hemoglobin Adducts and Decreases in Mammary Tumor Multiplicity. *The 17th International Symposium on Polynuclear Aromatic Hydrocarbons*, Palais des Congrés, Université de Bordeaux, Bordeaux, France, October 25-29, 1999.

46. Lewtas J, Williams R, **Myers SR**, and Wise S. Sources of Human Exposure to Airborne PAH. *The 17th International Symposium on Polynuclear Aromatic Hydrocarbons*, Palais des Congrés, Université de Bordeaux, Bordeaux, France, October 25-29, 1999.

47. Fitzpatrick JL, **Pierce WM**, and Prough RA. DHEA-treatment alters its own metabolism by P4502C11 and 3A23. *FASEB Journal* **13**: (5) A1013-A1013 Part 2 Suppl. S MAR 15, 1999.

48. **Neale JR**, **Emery NK**, **Smith NB**, Singh S, **Waite LC**, Taylor KG, and **Pierce Jr WM** (1999). A Bone Targeting Strategy for Selective Treatment of Bone Metabolic Disorders. *JOURNAL OF BONE AND MINERAL RESEARCH 14:* S409-S409 SUPPL. 1 SEP 1999 Presented at the *21st Annual Meeting of the American Society for Bone and Mineral Research*, St. Louis, MO, October 2, 1999.

49. **Song ZH** and Slowey CA. Involvement of cannabinoid receptors in the intraocular pressure-lowering effects of WIN55212-2. *Research!Louisville 1999*.

50. Zhong M and **Song ZH**. CB1 cannabinoid receptor-mediated cell migration. *Ohio Valley Society of Toxicology Meeting*, November 11-12, 1999.

51. **States JC** and Kaplan DJ. Regulation of XPA by cisplatin in cisplatin-resistant ovarian carcinoma cells. *ASM Conference on DNA Repair and Mutagenesis*, Hilton Head, SC, November 1 – 7, 1999.

52. **States JC**, Vincent AM, Wright J, Shaw T, and Maiese K. Rapid neuronal intracellular acidification triggers nitric oxide induced programmed cell death. *Society for Neuroscience*, 1999.

VII. Invited Scientific Presentations and Seminars (salaried faculty)

Dr. David Gozal

Morbidity of Pediatric Sleep Apnea: How Much Do We Really Know? 3rd International Congress, World Federation of Sleep Research Societies, Dresden, Germany, October 6, 1999.

So What If My Child Snores? Grand Rounds, Kosair Children's Hospital, Department of Pediatrics, University of Louisville, Louisville, KY, December 17, 1999.

Dr. David W. Hein

Role of the Acetylation Polymorphism in Genetic Susceptibility to Breast Cancer. Department of Ophthalmology and Visual Sciences, University of Louisville School of Medicine, Louisville, Kentucky, January 1999.

Molecular Epidemiology of Breast Cancer: Role of N-acetyltransferase Polymorphisms, Cigarette Smoking, and Consumption of Well-Done Meats. Department of Pharmacology and Toxicology, Indiana University School of Medicine, Indianapolis, Indiana, February 1999.

Gene/Environmental Interactions in Breast Cancer Risk. Center for Environmental Health Sciences, University of Louisville, Louisville, Kentucky, April 1999.

Genetic Susceptibility to Cancer: Role of the Acetylation Polymorphisms. Symposium on Genetic Determinants of Individual Sensitivity to Environmental Agents and Pharmaceutics, Midwest Regional Chapter of the Society of Toxicology, Lincolnshire, Illinois, May 1999.

Acetyltransferases-Genetics and Role in Toxicology. Symposium on Recent Advances in Phase II Enzymes and Their Role in Toxicology, XXXVII European Congress of Toxicology, Oslo, Norway, June 1999.

Acetylation Polymorphisms as Genetic Risk Factors for Cancer. Department of Molecular, Developmental, and Craniofacial Biology, University of Louisville School of Dentistry, Louisville, Kentucky, September 1999.

Molecular Toxicology: N-acetyltransferase Polymorphisms as Susceptibility Biomarkers of Cancer Risk from Aromatic and Heterocyclic Amine Carcinogens. Environmental Health Science Center, University of Wisconsin School of Medicine, Madison, Wisconsin, September 1999.

Dr. Y. J. Kang

Metallothionein in myocardial protection against oxidative injury. Institute for Cellular Therapeutics, University of Louisville, Louisville, KY, Dec. 15, 1999.

Antioxidant Functions of Metallothionein. Invited Plenary Lecture, The 6th Annual Meeting of the Oxygen Society, New Orleans, LA, Nov. 22, 1999.

Antioxidants and free radical-induced cardiomyopathy. Invited Plenary Speaker, 2nd International Conference on Antioxidants and Free Radicals in Health and Disease, Vancouver, Canada, July 27, 1999.

Manipulation by metallothionein of adriamycin cardiotoxicity and anticancer therapeutic efficacy. Department of Pathology, University of Louisville, Louisville, KY, March 25, 1999.

Cardiac protection by metallothionein against oxidative injury. Department of Physiology, Texas Tech University Health Sciences Center, Lubbock, TX, March 5, 1999.

Dr. Steven R. Myers

Metabolic Activation of Polycyclic Aromatic Hydrocarbons via Methyl Substitution Reactions. 17th International Meeting on Polycyclic Aromatic Compounds (ISPAC), Bordeaux, France, October 25-29, 1999.

Characterization of 4-Aminobiophenyl Hemoglobin Adducts in Maternal and Fetal Blood. 17th International Meeting on Polycyclic Aromatic Compounds (ISPAC), Bordeaux, France, October 25-29, 1999.

Quantitation analysis of benzo(a)pyrene hemoglobin adducts in maternal and fetal blood obtained from smokers. 17th International Meeting on Polycyclic Aromatic Compounds (ISPAC), Bordeaux, France, October 25-29, 1999.

Gas Chromatographic and Mass Spectrometric Determination of Hemoglobin Adducts of 1,3-Dinitrobenzene and 1,3,5-Trinitrobenzene in Shrew (cryptotis parva). International Meeting on Polycyclic Aromatic Compounds (ISPAC), Bordeaux, France, October 25-29, 1999.

Chemoprevention of DMBA Induced Mammary Carcinogenesis: Relationship Between Induction of Phase II Enzymes, Effects on DMBA Induced Hemoglobin Adducts and Decreases in Mammary Tumor Multiplicity. International Meeting on Polycyclic Aromatic Compounds (ISPAC), Bordeaux, France, October 25-29, 1999.

Sources of Human Exposure to Airborne PAH. International Meeting on Polycyclic Aromatic Compounds (ISPAC), Bordeaux, France, October 25-29, 1999.

Dr. William M. Pierce, Jr.

Bone Targeted Estrogens. Seminar presented at Eli Lilly Pharmaceutical Co., Indianapolis, IN, November 8, 1999.

Dr. Peter P. Rowell

Nicotinic Receptor Function: Consequences of Agonist Concentration and Treatment Duration. University of Pittsburgh, May 17, 1999.

Dr. Zhao-Hui Song

Cannabinoid Receptors as Potential Targets for Glaucoma Therapy. First Teaching Hospital, Beijing Medical University, December 22, 1999

VIII. Research Grants and Contracts (salaried faculty)

Research Grant and Contract Proposals Submitted

	Agency	Budget Requested
Dr. David Gozal		
Episodic hypoxia, REM sleep deprivation, and hippocampal function (PI) 06/00 – 06/04	NHLBI	$900,000
PDGF in development of hypoxic ventilatory response (PI) 06/00 – 06/04	NICHD	$969,529
Dr. Evelyne Gozal		
PDGF in development of hypoxic ventilatory response (Co-I); D. Gozal (PI) 06/00 – 06/04	NICHD	$969,529
Dr. David W. Hein		
Pharmacogenetics of drug and carcinogen metabolism (continuation) (PI) 07/01/99 – 06/30/00	NCI	$371,339
Chemically-induced mutagenesis in human liver cells (Collaborator); Kent Mitchell (PI) 04/01/00 – 03/31/05	NIH	$1,392,889
Biomarkers of maternal and fetal tobacco exposure (Co-I); Steve Myers (PI) 04/01/00 – 03/31/03	NIH	$1,075,600
Genetic susceptibility to vinyl chloride-induced liver cancer (Co-I); Roland Valdes (PI) 07/01/00 – 06/30/04	NIH	$1,607,680
Human obese gene and prostate cancer (Co-I); Sally Weinrich (PI) 09/01/99 – 06/30/00	UofL Human Genetics Enhancement Grant	$25,000

Dr. Harrell E. Hurst	**Agency**	**Budget Requested**
N-(carboxymethyl)valine-Hb: Marker for AGE in Diabetes (PI) 09/01/99 - 08/31/01	NIH	$197,731
Chemoprevention using Oltipraz and N-acetylcycteine (Co-I); S.R. Myers (PI) 10/01/99 - 06/30/01	NCI	$212,508
Clinical Phase I Multiple Dose Safety and Pharmacodynamic Study of the combination of N-acetylcycteine and Oltipraz (Co-I); S.R. Myers (PI) 10/01/99 - 06/30/01	NCI	$212,508
Chemoprevention of DMBA Induced Carcinogenesis (Co-I); S.R. Myers (PI) 04/01/00 - 03/31/03	NIH	$648,000
Biomarkers of Maternal and Fetal Tobacco Smoke Exposure (Co-I); S.R. Myers (PI) 04/01/00 - 03/31/03	NIH	$750,000
West Louisville Partnership for Environmental Justice (Co-I); S.R. Myers (PI) 04/01/00 - 03/031/02	NIH	$397,149
Endothelial Metabolism of Atherogenic Aldehydes (Co-I); S. Srivastava (PI) 06/01/00 - 05/31/05	NIH	$875,000
Dr. Y. James Kang		
Oxidative Stress and Heart Failure by Copper Deficiency (PI)	NHLBI	$1,321,000
Dr. Steven R. Myers		
Chemoprevention using Oltipraz and N-acetylcycteine (PI) 10/01/99 - 06/30/01	NCI	$212,508
Clinical Phase I Multiple Dose Safety and Pharmacodynamic Study of the combination of N-acetylcycteine and Oltipraz (PI) 10/01/99 - 06/30/01	NCI	$212,508

Dr. Steven R. Myers (cont.)	**Agency**	**Budget Requested**
Chemoprevention of DMBA Induced Carcinogenesis (PI) 04/01/00 - 03/31/03	NIH	$648,000
Biomarkers of Maternal and Fetal Tobacco Smoke Exposure (PI) 04/01/00 - 03/31/03	NIH	$750,000
West Louisville Partnership for Environmental Justice (PI) 04/01/00 - 03/031/02	NIH	$397,149
Dr. Donald E. Nerland		
Vinyl Monomers: Detoxified by Glutathione S-Transferases (PI) 02/01/00 – 01/31/04	NIH	$722,647
Dr. William M. Pierce, Jr.		
Bone Targeted Estrogens: Specificity and Mechanism (PI) 07/01/00 – 06/30/03	NIH	$963,332
Metalloproteinase – Inhibitor Interactions (Co-I); Robert D. Gray (PI) 1999 - 2002	NIH	$343,135
Proteomic analysis of MDCK cell protein expression: Identification of novel magnesium regulatory proteins (Collaborator); John Arthur (PI) 2000-2002	American Heart Association	$90,000
CYP Isoforms and Cardiovascular Function (Co-I); Ayotunde Adeagbo (PI) 02/01/99 – 01/31/01	NIH	~$70,000
Renal Sodium Phosphate Transporter (Co-I); Eleanor Lederer (PI) 2000 - 2003	Veterans Administration	$224,000
Endothelin, G-Proteins & Renovascular Resistance in Aging (Consultant); Jeff C. Falcone (PI) 04/01/00 - 03/31/03	NIA	$252,000
Platelet Intracellular Ca2+ in Renal Disease (Collaborator); William Dean (PI) 1999 – 2003	NIH	$959,383
Computer Assisted Tomography Scanner (Co-I); William Hnat (PI) 2000-2002	NSF	$500,000

Dr. William M. Pierce, Jr. (cont.)	**Agency**	**Budget Requested**
Aging Induced Renal Dysfunction: G Protein Activity (Co-I); John C. Passmore (PI) 02/01/99 – 01/31/01	NIH	$268,731
Neutrophil Respiratory Burst in Azotemia (Collaborator); Richard Ward (PI) 1999 - 2002	NIH	$ ~200,000
Dr. Peter P. Rowell		
Cholinergic influences on corticothalamic transmission (Co-I); A.R. Caggiula (PI) 10/1/00 - 9/30/05	NIH	$875,000
Cholinergic influences on corticothalamic transmission (Co-I); M.E. Bickford (PI) 7/1/00 - 6/30/05	NIH	$1,227,000
Effect of nicotine dependence on work performance in chronic obstructive pulmonary disease (Co-I); J.F. Walker (PI) 7/1/00 - 6/30/02	American Lung Association	$46,004
Dr. Zhao-Hui (Joe) Song		
Structure and Function of CB2 Cannabinoid Receptor, DA11551 (PI) 09/30/98 – 09/30/03	NIH	$507,304
Dr. Leonard C. Waite		
Bone Targeted Estrogens: Specificity and Mechanism (Co-I); William M. Pierce, Jr. (PI) 07/01/00 – 06/30/03	NIH	$963,332

Research Grants and Contracts in Force (salaried faculty)

	Agency	Project Award
Dr. Frederick W. Benz		
Acute Acrylonitrile Intoxication: Antidotal Assessment (PI) 09/01/98 – 08/31/99	NIEHS	$108,088
Dr. Laurence A. Carr		
An Immunological Role for Brain Dopamine Systems (PI) 09/01/98-03/01/00	SOM Research Committee	$7,920
Dr. Theresa S. Chen		
Acute Acrylonitrile Intoxication: Antidotal Assessment (Co-I); F.W. Benz (PI) 09/01/98 – 08/31/99	NIEHS	$105,432
Role of Genetic Polymorphism in Liver Toxicity (PI) 09/01/98 – 08/31/99	IDEA Pilot Proposal	$8,077
Dr. David Gozal		
Central role of platelet-activating factor in the hypoxic ventilatory response (PI) 07/97 – 06/00	American Lung Association Career Development Award	$105,000
Neurocognitive function in snoring children (PI) 10/99 – 9/03	NHLBI	$1,000,000
Sleep episodic hypoxia and memory deficit in aging rats: Protection by platelet-activating factor antagonists (PI) 01/00 – 12/02	American Heart Association	$214,500
Dr. David W. Hein		
Pharmacogenetics of Drug and Carcinogen Metabolism (PI) 09/01/97 – 06/30/02	NCI	$1,859,936

Dr. David W. Hein (cont.)	**Agency**	**Project Award**
Metabolic Basis of Sulfonamide Toxicity in AIDS patients (P.I. on subproject) 09/01/97 – 05/31/00	NIH-Subcontract from Wayne State	$768,169
Role of genetic polymorphism in liver toxicity (Co-I); Theresa S. Chen (PI) 09/01/98 – 08/31/99	IDEA Pilot Proposal	$8,077
Dr. Harrell E. Hurst		
The Center for the Study of Environmental Hazards to Reproductive Health (Project Investigator/Core Lab Director); F.J. Hendler (PI) 01/01/97 - 12/31/99	Veterans Administration	$949,100
Acute Acrylonitrile Intoxication – Antidotal Assessment (Collaborator); F.W. Benz (PI) 09/01/98 - 08/31/99	NIEHS	$108,088
Dr. Y. James Kang		
Effect of Catalase on Adriamycin Cardiotoxicity (PI) 08/01/95-07/31/00	NCI	$507,500
Suppression of Cardiac Ischemia-Reperfusion Injury by Overexpression of metallothionein (PI) 01/01/97-12/31/00	American Heart Association	$300,000
Metallothionein and Adriamycin Cardiotoxicity (PI) 04/01/99 – 03/31/02	NHLBI	$623,000
Metallothionein and Adriamycin Cardiotoxicity (PI) 04/01/99 – 03/31/02	Jewish Hospital Foundation	$50,000
Metallothionein and Alcoholic Liver Injury (PI) 12/01/98-10/31/99	UofL Medical School	$15,000
Dr. Steven R. Myers		
Hemoglobin adducts of tobacco smoke carcinogens (PI) 12/31/98 – 12/31/00	NCI – McKesson Bioservices	$20,000

Dr. Steven R. Myers (cont.)	**Agency**	**Project Award**
In Utero and neonatal exposure to environmental tobacco smoke and its effects on pulmonary development, lung function, and respiratory illness in the first year of life (Co-I); M.P. Ross (PI) 1/1/95 – 12/31/00	Alliant Community Trust	$203,980
Equipment purchase:Mass Spectrometer (PI)	WHAS Crusade for Children	$100,000
Dr. Donald E. Nerland		
Acute Acrylonitrile Intoxication: Antidotal Assessment (Co-I); F.W. Benz (PI) 09/01/98-08/31/99	NIEHS	$108,088
Dr. William M. Pierce, Jr.		
Bone Targeting of Estrogens for Osteoporosis (PI) 02/01/99 – 09/30/99	KOWA	$167,000
Bone Targeting of Pharmaceutical Agents for Osteoporosis – Phase 3 (P.I.) 08/01/98 – 02/01/99	KOWA	$32,692
HPLC Electrospray Mass Spectrometer (P.I.) 6/1/97 – 05/31/98	NIH	$307,954
Blood Lead Monitoring (PI) 01/01/99 – 12/31/99	Service to Regional Practitioners	$29,823
Atomic Absorption Spectrophotometer (PI) 08/01/98 – 07/31/99	WHAS Crusade for Children	$50,000
Regulation of Neutrophil Activation (Collaborator); Kenneth McLeish (PI) 1999-2002	VA Merit Review	$300,000
Estrogens: Bone Blood Flow and Bone Mechanical Properties (Collaborator); John Fleming (PI) 1999 - 2000	NIH	$50,000

Dr. Peter P. Rowell	**Agency**	**Project Award**
Effect of nicotine on central nicotinic receptor activation and desensitization (PI) 07/01/99 – 06/30/01	Kentucky Tobacco and Health Research Institute	$127,304
Functional activity of mesolimbic nicotinic receptors (PI) 9/1/99 - 6/30/02	NIH	$299,508
Dr. Zhao-Hui (Joe) Song		
Structure and Function of CB2 Cannabinoid Receptor (PI) 09/30/98 – 09/30/03	NIH	$507,304
Dr. J. Christopher States		
DNA Damage by Bioactivated Xenobiotics (PI) 09/99 - 07/00	NIEHS	$862,845
Genetic Polymorphisms in the Xeroderma Pigmentosum Group A Gene (PI) 10/99 - 6/00	IDEA Pilot Proposal	$18,000
Dr. Leonard C. Waite		
Bone Targeting of Pharmaceutical Agents for Osteoporosis – Phase 3 (Co-I); W.M. Pierce (PI) 08/01/98 – 02/01/99	KOWA	$32,692
Bone Targeting of Estrogens for Osteoporosis (Co-I); W.M. Pierce (PI) 02/01/99 – 09/30/99	KOWA	$167,000
Dr. Walter M. Williams		
Role of Genetic Polymorphism in Liver Toxicity (Co-I); Theresa S. Chen (PI) 09/01/98 – 08/31/99	IDEA Pilot Proposal	$8,077

IX. Teaching

School of Medicine

The Department team-taught the Medical Pharmacology course to second year medical students. Dr. Mike Williams served as course director. In addition, Dr. Laurence Carr served as co-director of the interdisciplinary Clinical Neuroscience course. Individual faculty contributions are identified in the Appendix.

School of Dentistry

The Department team-taught the Dental Pharmacology and Therapeutics course to second year dental students. Dr. Leonard Waite served as course director. Individual faculty contributions are identified in the Appendix.

School of Nursing

The Department team-taught a Basic Pharmacology for Nursing course to second year nursing students. The course is also cross-listed as Biology 390 and is taken by other undergraduate students. Dr. William Pierce served as course director. Individual faculty contributions are identified in the Appendix.

The Department team-taught an Advanced Pharmacology course to graduate nursing students. Dr. Leonard Waite served as course director. Individual faculty contributions are identified in the Appendix.

School of Allied Health

The Department team-taught a Pharmacology course to second year students in the Dental Hygiene Program. Dr. Leonard Waite served as course director. Individual faculty contributions are identified in the Appendix.

Graduate School

The Department team-taught several courses for graduate students. The individual courses and course directors were as follows:

Principles of Drug Action (Dr. Frederick Benz)
Research Methods (Dr. William Pierce)
Pharmacology Seminar (Dr. Donald Nerland)

Individual faculty contributions to these courses are identified in the Appendix.

Individual faculty served on a number of graduate student committees as identified in the Appendix.

X. Service

Faculty provided service to the Department, the School of Medicine, the University of Louisville, the profession, the nation, and the community in many ways. Individual faculty service activities are identified in the Appendix.

XI. Honors and Awards

Several faculty, students and staff were received research poster awards from the Jewish Hospital Foundation at the Research!Louisville meeting. **Drs. William Pierce** and **Len Waite** received first place, and **Dr. David Hein** received third place (faculty) awards in the category of Potential for Major Clinical Applications. **Jason Neale** received second place and **Adrian Fretland** received honorable mention awards in the graduate student competition. **Dr. Stephanie Webb** received an honorable mention award in the postdoctoral fellow competition.

Adrian Fretland received the third place award for his research poster at the annual meeting of the Ohio Valley Society of Toxicology, and was selected the 1999 K.C. Huang Outstanding Graduate Student in the Department of Pharmacology and Toxicology.

Dr. David Gozal was an invited Speaker at the 3rd International Congress of the World Federation of Sleep Research Societies, and was appointed Distinguished University Scholar at the University of Louisville.

Dr. David Hein was an invited Speaker at the XXXVII European Congress of Toxicology, and served as President of the Ohio Valley Society of Toxicology.

Dr. James Kang was an invited plenary speaker at the 6th Annual meeting of the Oxygen Society and the 2nd International Conference on Antioxidants and Free Radicals in Health and Disease.

Dr. Steven Myers was an invited speaker at the 17th International Meeting on Polycyclic Aromatic Compounds.

Dr. Mitchell Ross was promoted to associate professor with tenure.

XII. Standing Committees

Graduate Program Committee

Dr. Len Waite (Chair)
Dr. William Pierce (2001)
Dr. Peter Rowell (2000)
Dr. Fred Benz (1999)

PBSI/Grievance Committee

Dr. Peter Rowell (Chair)
Dr. Harrell Hurst (2001)
Dr. Mike Williams (2000)
Dr. Don Nerland (1999)

Teaching Evaluation Committee

Dr. Larry Carr (Chair)
Dr. Fred Benz (2001)
Dr. Mike Williams (2000)
Dr. Len Waite (1999)

Seminar Committee

Dr. Don Nerland (Chair)
Dr. Steve Myers (2001)
Dr. Theresa Chen (2000)
Dr. Harrell Hurst (1999)

Core Laboratories/Research Development Committee

Dr. William Pierce (Chair)
Dr. Theresa Chen (2001)
Dr. Steve Myers (2000)
Dr. Larry Carr (1999)

Ad hoc Technology/Y2K Committee

Dr. Harrell Hurst (Chair)
Dr. Fred Benz
Ms. Edie Greca

A Resolution in Recognition of the Service of Dr. Peter K. Knoefel to the University of Louisville

Whereas, Peter Klerner Knoefel was born in 1906 in New Albany, Indiana, received his Bachelor of Arts and Master of Arts from the University of Wisconsin, and his M.D. (cum laude) with special honors in physiology from Harvard Medical School; and

Whereas, Dr. Knoefel served as an assistant (1927-1928) and an instructor (1928-1929) in the Department of Pharmacology at the University of Wisconsin, served as a National Research Council Fellow (1931-1932), and as a research associate (1932-1935) in the Department of Pharmacology at Vanderbilt University; and

Whereas, Dr. Knoefel joined the University of Louisville in 1935, where he served as assistant professor of pharmacology (1935-1938), associate professor of pharmacology (1938-1939), professor of pharmacology (1939-1968), and professor emeritus of pharmacology (1968-1999); and

Whereas, Dr. Knoefel was appointed and served as the first chairperson of the newly created Department of Pharmacology at the University of Louisville (1941-1966), where he recruited and led an outstanding faculty and program, and served as chairman emeritus (1966-1999) of the Department; and

Whereas, Dr. Knoefel established the graduate training program in pharmacology in 1954 and served as the advisor of four students receiving the Ph.D. degree; and

Whereas, Dr. Knoefel was a member of the American Society for Pharmacology and Experimental Therapeutics, The Society of Experimental Biology and Medicine, The American Chemical Society, and Sigma Xi; and

Whereas, Dr. Knoefel was an expert in nervous system pharmacology, renal pharmacology and tubular transport mechanisms; on snake venoms, and radiopaque substances; and published numerous articles in scientific journals on local and general anesthetics, central stimulants, autonomic drugs, spasmolytic drugs, alimentary drugs, cardiac output and fluid therapy, radiopaque substances, alcohol, renal transport, and drug distribution; and

Whereas, Dr. Knoefel authored a book on *Radiopaque Diagnostic Agents*, edited and contributed to two volumes of the *International Encyclopedia of Pharmacology and Therapeutics*, edited and contributed to a textbook on the *Absorption, Distribution, Transformation and Excretion of Drugs*; and

Whereas, Dr. Knoefel served as Visiting Professor at the Institute and Museum of History of Science, Florence, Italy, was a distinguished scholar on the history of pharmacology and medicine, wrote *Felice Fontana 1730-1805. An Annotated Bibliography, Felice Fontana Life and Works;* and *Francesco Redi on Vipers*, and *A Hellenistic Treatise on Poisonous Animals (The "Theriaca" of Nicandes of Colophon),* and

Whereas, endowments have been established in his name to support an award for a graduating medical student at the University of Louisville who has shown special interest and ability in the basic and clinical areas of pharmacology, and for an endowed professorship in the Department of Pharmacology and Toxicology; and

Whereas, Dr. Knoefel was universally admired, appreciated, and respected by his colleagues, students, and friends; and

Whereas, Dr. Knoefel's death on January 14, 1999, is a great loss to his friends and family, to the Department, the School of Medicine, and to the entire scientific community, all of whom hold him in highest respect and esteem; now

Therefore Be It Resolved, the Medical Council of the University of Louisville School of Medicine extends its deepest sympathy to his wife, the former Francesca Spina; and

Be It Further Resolved that this resolution by spread upon the minutes of the Medical Council this 24th day of February in the year nineteen hundred ninety-nine.

A Resolution in Recognition of the Service of Dr. Carlo H. Tamburro to the University of Louisville

Whereas, Carlo H. Tamburro was born January 20, 1936, in Caserta, Italy, received his B.S. in Biology at Georgetown University, his M.D. from Seton Hall College of Medicine & Dentistry, and his M.P.H. in Environmental Sciences (Toxicology) from Columbia University School of Public Health, and

Whereas, Dr. Tamburro completed a National Institutes of Health Postdoctoral Fellowship under the direction of Dr. C. M. Leevy in the Division of Hepatic Metabolism & Nutrition at the Jersey City Medical Center and the East Orange Veterans Administration Hospital, East Orange, New Jersey, from 1965 to 1968, and served as Coordinator of these programs from 1969-1974, and

Whereas, Dr. Tamburro joined the University of Louisville in 1974 and served as Chief, Division of Digestive Diseases and Nutrition (1974-1980), Head, Occupational Medical Surveillance Team (1974-1979), Director, Vinyl Chloride Project (1974-1985), Director, Liver Research Center and Liver Reference Laboratory (1980-1999), Chief, Division of Occupational Health (1981-1989), Acting Chairman, Department of Community Health (1985-1989), Chief, Division of Occupational Toxicology (1990-1999), and founding Co-Director, Center for Environmental Health Sciences (1993-1999), and

Whereas, Dr. Tamburro served as Assistant in Medicine at Tufts Medical School (1964-1965), Assistant (1966-1967) and Instructor (1967-1969) in Medicine at the New Jersey College of Medicine, Assistant (1970-1974) and Associate (1974) Professor of Medicine at the College of Medicine & Dentistry of New Jersey, Associate Professor of Medicine (1974-1977), Associate in Oncology (1975-1999), Associate in Pediatrics (1977-1999), Professor of Medicine (1977-1999), Professor of Community Health (1981-1989), Associate in Pharmacology and Toxicology (1982-1989), Professor of Pharmacology and Toxicology (1990-1999), Member of the Graduate Faculty (1991-1999) and Associate of the Center of Excellence in Applied Microcirculatory Research (1991-1999) of the University of Louisville, and

Whereas, Dr. Tamburro was elected to thirty-four international, national, regional, and professional societies, and

Whereas, Dr. Tamburro received several honors from the College of Medicine and Dentistry of New Jersey, including receipt of the the Alumni Award for Distinguished Service in 1972, election to Alpha Omega Alpha in 1979, election as a fellow of the American College of Physicians in 1984, selection for the J. James Smith, M.D. Memorial Lecture, and selection as the commencement speaker at the New Jersey Medical School House Officer Commencement in 1988, and

Whereas, Dr. Tamburro served as a consultant in hepatology and nutrition for a number of organizations and hospitals, and was a scientific reviewer for 14 different scientific journals, and

Whereas, Dr. Tamburro was listed in Who's Who in Health Care, Who's Who in Legal Medicine, American Men and Women of Science, Who's Who in the Southwest in Medicine, Who's Who in American Education, Who's Who in Science and Engineering, and Who's Who in Medicine and Health Care, and

Whereas, Dr. Tamburro served as a mentor to many graduate students, postgraduate fellows, physician preceptors, and summer research students, and

Whereas, Dr. Tamburro participated in 80 scientific research grants, contracts and services, and authored or co-authored over 100 scientific and professional articles in books and journals, and over 100 additional scientific abstracts and presentations, and

Whereas, Dr. Tamburro was universally admired, appreciated, and respected by his colleagues, students, and friends; and

Whereas, Dr. Tamburro's death on January 29, 1999 is a great loss to his friends and family, to the Department of Medicine, and Pharmacology and Toxicology, the School of Medicine, and to the entire scientific community, all of whom hold him in highest respect and esteem; now

Therefore Be It Resolved, the Department of Medicine, and Pharmacology and Toxicology extends its deepest sympathy to his wife, Kathleen O'Connell, his sons Carlo, Alexander, and Stefan, his daughter, Katerina, and his sister Mary Grace O'Connor, and

Be It Further Resolved that this resolution be spread upon the minutes of the Department of Pharmacology and Toxicology this 2nd Day of February, and the Department of Medicine on the 7th Day of February in the year nineteen hundred and ninety nine.