Department of

Pharmacology and Toxicology

1997

Annual Report

Table of Contents

I. Executive Summary

1997 was a year of transition for the Department of Pharmacology and Toxicology. The most obvious change was the retirement of Dr. William J. Waddell as Chairman on July 1 following twenty years of outstanding leadership as Chairman of the Department of Pharmacology and Toxicology. Dr. Waddell was appointed Chairman Emeritus and was honored with a reception sponsored by the Dean's office in November. A search committee was formed to select an individual to succeed Dr. Waddell, chaired by Dr. Russell A. Prough, Professor and Chairman of the Department of Biochemistry and Molecular Biology. Following a nationwide search, Dr. David W. Hein, Chester Fritz Distinguished Professor and Chairman of the Department of Pharmacology and Toxicology at the University of North Dakota School of Medicine and Health Sciences accepted appointment as Professor and Chairman effective August 1. Dr. Hein was also appointed a University of Louisville Distinguished University Scholar and Peter K. Knoefel Professor. Dr. Hein's start-up package included two endowments, one funding the Peter K. Knoefel Professorship and the second funding graduate student assistantships, departmental operating expenses, and three new faculty positions.

Faculty highlights included the promotions of Dr. Frederick W. Benz and Dr. William M. Pierce, Jr., from associate professor to professor effective July 1. In addition, Dr. Walter M. Williams received the Golden Apple Award for excellence in teaching. Several faculty were successful in receipt of research grant funding, including receipt of a major NIH shared instrumentation grant by Dr. Pierce for purchase of a HPLC Electrospray Mass Spectrometer. Several Departmental core research laboratories were planned and initiated for radioisotopes, mass spectrometry, spectroscopy, tissue culture and image analysis, centrifugation and autoclave, and distilled water/ ultrafreezer storage/ice machine. Renovations were completed for several of the core research laboratories, as well as Dr. Hein's research laboratory and the Department office suite. Ethernet connections were provided to all primary faculty and the office staff.

The Department faculty held two retreats to review its mission, strategic plans, graduate program, teaching program, and policies for appointment, promotion, tenure, and periodic career review of faculty. The faculty also reviewed current policies for faculty work assignments, annual evaluations, and determination of performance-based salary increases. Following these faculty retreats, major revisions were made in a number of departmental programs and documents. Each of the following documents was initiated or underwent major revision. Each was approved by unanimous vote of the departmental faculty:

1. Departmental Mission Statement.
2. Departmental Policy for Appointment, Promotion and Tenure, and Periodic Career Review.
3. Departmental Guidelines for Appointment, Promotion and Tenure, and Periodic Career Review of Special Faculty.
4. Departmental Guidelines for Preparation of Faculty Periodic Career Review Portfolio.
5. Departmental Template for Faculty Annual Work Assignments.
6. Departmental Guidelines for Preparation of Annual Reports.
7. Departmental Faculty Teaching Evaluation Form.

The faculty discussed and planned major changes in the graduate program and the strategic plan to emphasize research excellence. The graduate program changes and a Department Strategic Plan were formally approved in 1998. Five students successfully completed the pharmacology and toxicology Ph.D. graduate program and seven new students were accepted into the program in 1997.

The faculty also established and elected five standing committees to implement the new policies and programs initiated:

1. Graduate Program Committee (Dr. Leonard C. Waite, Chair)
2. PBSI/Grievance Committee (Dr. Peter P. Rowell, Chair)
3. Teaching Evaluation Committee (Dr. Laurence A. Carr, Chair)
4. Seminar Committee (Dr. Donald E. Nerland, Chair)
5. Core Laboratories/Research Administration Committee (Dr. William Pierce, Jr., Chair)

The Chair also formed an ad hoc faculty search committee to initiate the recruitment for the three new positions. The faculty determined that the emphasis for selection would be excellence in research and research training, with priority given to research areas that complement the University of Louisville Challenge for Excellence and assist the University of Louisville in reaching Carnegie Level 1 research status.

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. Personnel Listing

A. 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).

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

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).

B. Faculty with Joint Appointments

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

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

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).

Tamburro, Carlo H., Professor of Medicine, and Pharmacology and Toxicology, and Chief, Division of Occupational Toxicology; M.D., Seton Hall (1962); M.P.H., Columbia University (1985).

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).

C. Faculty with Associate Appointments

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 and Chairman of Anesthesiology; M.D., University of the East Ramon Magsaysay Memorial Medical Center (1962).

Ross, Mitchell P., Assistant 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).

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

D. Faculty with Emeritus Appointments

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

Huang, Kee Chang, Professor Emeritus; M.D. Columbia University (1953).

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

Knoefel, Peter K., Emeritus Professor and Chairman; M.D., Harvard University (1931).

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

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

E. Faculty with Adjunct Appointments

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

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

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).

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

F. Faculty with Emeritus Adjunct Appointments

Csaky, Tihamer Z., Emeritus Adjunct Professor of Pharmacology and Toxicology; M.D., University of Budapest (1939).

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

Gordon, Helmut A., Emeritus Adjunct Professor of Pharmacology and Toxicology; M.D., University of Budapest (1932).

G. Staff

Carpenter, Sharon; Administrative Secretary

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

Corbett, Donna; Lab Tech III

Doll, Mark; Research Associate

Duggan, Deborah; Lab Tech III

Emery, Nicole; Lab Tech III

Jamison, Andrea; Lab Tech II

Marlowe, Carolyn; Research Associate

Metaxas, John; Coordinator, Therapeutics and Toxicology Laboratory

Greca, Edie; Business Manager II

Rubin-Teitel, Heddy; Program Assistant III

Smith, Ned; Lab/Research Technician III

Srinivasan, Chandrika, Ph.D., Student Assistant

Wenger, Aaron; Student Assistant, Therapeutics and Toxicology Laboratory

H. Graduate Students

Alimgozhin, Talgat; (Ph.D.)

Brewer, Bradley G.; (Ph.D.)

Cai, Jian; (Ph.D.)

Fretland, Adrian; (Ph.D.; University Fellow)

Fu, Xin; (Ph.D.)

Han, Sue (Ph.D. awarded August, 1997)

Hasselbacher, David; (M.S.)

Kreklau, Emiko; (Ph.D. awarded December, 1997)

Hennion, John; (Ph.D.)

Jacobs, Al (Chip); (Ph.D.)

Leff, Matthew; (Ph.D.)

Li, Junyu; (Ph.D.)

Li, Mary (Ph.D. awarded August, 1997)

Melo, Nicolas; (M.S.)

Payne, Scot; (Ph.D.)

Spinnato, Joe; (Ph.D.)

Srinivasan, Chandrika (Ph.D. awarded May, 1997)

Wu, Qiang (Ph.D. awarded August, 1997)

I. Postdoctoral Fellows

Meng, Xianweng

Wang, Guang-wu

Wang, Ju-Feng

Wu, Huiyun

J. Division of Occupational Toxicology

Buchanan, Stephanie, B.S.N.; Clinical Research Coordinator

Canchis, Willie, M.D.; Research Fellow

Cho, Lori; Student Assistant

Crawford, Robert; Student Assistant

Cutno, Shannon; Student Assistant

Deeb, Lililane, M.D.; Research Fellow

Fortwengler, Philip; Manager, Medical Surveillance

Hahn, Hye; Clerical Specialist III

Hall, Carl, Ph.D.; Project Coordinator

Henry, Nancy; Secretary II

Hill, Don; Student Assistant

Hiser, Melissa; Clerical Specialist III

Jackman, Maria; Executive Secretary

Jarman, Susanna; Student Assistant

Kapoor, Sandeep, M.D.; Research Fellow

Kara, Jasmine; Student Assistant

Matthews, Sherri; Executive Secretary

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

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

Quiggins, Patricia, Ph.D.; Research Associate

Redferin, Lauren; Student Assistant

Reynolds, Eva; Receptionist

Reynolds, Lark; Program Assistant III

Richardson, Rita; Secretary II

Self, Jessica; Student Assistant

Sherrill, Mike; Student Assistant

Sterry, Rachel; Student Assistant

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

K. Faculty and Staff Appointments

Doll, Mark A., M.S., Research Associate, September 1, 1997

Emery, Nicole, Lab Technician III, October 15, 1997

Hayes, A. Wallace, Ph.D., Adjunct Professor, October 1, 1997

Hein, David W., Ph.D., Peter K. Knoefel Professor and Chairperson, August 1, 1997

Jamison, Andrea, Lab Technician II, November 17, 1997

Srinivasan, Chandrika, Ph.D., Student Assistant, November 10, 1997

Waddell, William J., M.D., Chairman Emeritus, July 1, 1997

L. New Graduate Student Appointments

Alimozhin, Talgat

Brewer, Bradley

Fretland, Adrian

Fu, Xin

Hennion, John

Leff, Matthew

Melo, Nicolas

M. Graduations

Han, Sue (Ph.D. awarded August, 1997)

Kreklau, Emiko Hatcher (Ph.D awarded December, 1997)

Li, Mary (Ph.D. awarded May, 1997)

Srinivasan, Chandrika (Ph.D. awarded May, 1997)

Wu, Qiang (Ph.D. awarded August, 1997)

N. Periodic Career Reviews

Carr, Professor Laurence (satisfactory)

Tamburro, Professor Carlo (satisfactory)

Waite, Professor Leonard (satisfactory)

IV. Manuscripts and Book Chapters

Benz, F.W. "Pharmacodynamics: Drug Receptor Interactions." In *Textbook of Ocular Pharmacology (First Edition).* T.J. Zimmerman, K.S. Kooner, M. Sharir, and R.D. Fechtner (Eds.), Philadelphia, PA: Lippincott-Raven, pp. 9-34, 1997.

Benz, F,W., Nerland, D.E., Li, J., and Corbett, D. Dose-dependence of covalent binding of acrylonitrile to tissue protein and globin in rats. *Fund. Appl. Toxicol.* **36**, 149-156, 1997.

Benz, F.W., Nerland, D.E., Corbett, D., and Li, J. Biological markers of acute acrylonitrile intoxication in rats as a function of dose and time. *Fund. Appl. Toxicol.* **36**, 141-148, 1997.

Deitz, A.C., Doll, M.A., and Hein, D.W. A restriction fragment length polymorphism assay that differentiates human N-acetyltransferase- I (NAT 1) alleles. *Anal. Biochem.* **253**, 219-224, 1997.

Feng, Y., Fretland, A.J., Jiang, W., Becker, W.K., and Hein, D.W. Higher frequency of aberrant crypt foci in rapid than slow acetylator inbred rats administered the colon carcinogen 3,2'-dimethyl-4-aminobiphenyl. *Toxicol. Appl. Pharmacol.* **147**, 56-62, 1997.

Fretland, A.J., Feng, Y., and Hein, D.W. DNA adduct levels in rapid and slow acetylator rats administered 2-amino-1-methyl-6-phenyl imidazo[4,5-b]pyridine (PhIP). *Proc. West. Pharmacol. Soc.* **40**, 9-12, 1997.

Zaher, H., Lindblad, W.J., Jiang, W., Doll, M.A., Hein, D.W., and Svensson, C.K. Acetyl CoA:arylamine N-acetyltransferase activity in rat hepatocytes cultured on different extracellular matrices. *Toxicol. In Vitro* **11**, 271-283, 1997.

Hurst, H.E., "Introduction to Toxicology" In *Textbook of Ocular Pharmacology (First Edition).* T.J. Zimmerman, K.S. Kooner, M. Sharir, and R. D. Fechtner (Eds.), Philadelphia, PA: Lippincott-Raven, pp. 179-186, 1997.

Kang, Y.J., Chen, Y., Yu, A., Voss-McCowan, M., and Epstein, P.N. Overexpression of metallothionein in the heart of transgenic mice suppresses doxorubicin cardiotoxicity. *J. Clin. Invest.* **100**, 1501-1506, 1997.

Li, G., Chen, Y., Saari, J.T., and Kang, Y.J. Catalase overexpressing transgenic mouse heart is resistant to ischemia-reperfusion injury. *Am. J. Physiol.* **273**, H1090-H1095, 1997.

Chen, Y., Yu, A., Saari, J.T. and Kang, Y.J. Repression of hypoxiareoxygenation injury in the catalase overexpressing heart of transgenic mice. *Proc. Soc. Exp. Biol. Med.* **216**, 112-116, 1997.

Gout, P.W., Kang, Y.J., Buckley, D., Bruchovsky, N., and Buckley, A.R. Increased cystine uptake capability associated with malignant progression of Nb2 lymphoma cells. *Leukemia* **11**, 1329-1337, 1997.

Hatcher, E.L., Alexander, J.M., and Kang, Y.J. Decreased sensitivity to adriamycin in cadmium-resistant human lung carcinoma A549 cells. *Biochem. Pharmacol.* **53,** 747-754, 1997.

O'Brien, P.J., Dameron, G.W., Beck, M.L., Kang, Y.J., Erickson, B.K., Di Battista, T.H., Miller, K.E., Jackson, K.N., Mittelstadt, S. Cardiac troponin T is a sensitive, specific biomarker of cardiac injury in laboratory animals. *Lab. Anim. Sci*. **47,** 486-495, 1997.

Galandiuk, S., Wrightson, W.R., Young, S., Myers, S.R., and Polk, H.C., Jr. Absorbable, delayed-release antibiotic beads reduce surgical wound infliction. *J. Am. Surg*. **63**, 831-835, 1997.

Pokorny, R.M., Wrightson, W.R., Lewis, R.K., Paris, K.J., Hofmeister, A., Larocca, R., Myers, S.R., Ackerman, D., and Galandiuk, S. Suppository administration of chemotherapeutic drugs with concomitant radiation for rectal cancer. *Dis. Colon Rectum* **40**, 1414-1420, 1997.

Cerna, M., Pastorkova, A., Myers, S.R., Rossner, P., and Binkova, B. The use of a urine mutagenicity assay in the monitoring of environmental exposure to genotoxins. *Mutat Res,* **391**, 99-110, 1997.

Weeks, J.W., Myers, S.R., Lasher, L., Goldsmith, L.J., Watkins, C., and Gall, S.A. Persistence of penicillin G benzathine in pregnant group 13 streptococcus carriers. *Obstet. Gynecol*. **90**, 240-243, 1997.

Wu, Q., Delamere, N.A., and Pierce, W.M. Membrane associated carbonic anhydrase in cultured rabbit nonpigmented ciliary epithelium. *Invest. Ophth. Vis. Sci.* **38**, 2093–2102, 1997.

Rowell, P.P., and Li, M. Dose-response relationship for nicotine-induced upregulation of rat brain nicotinic receptors. *J. Neurochem.* **68**, 1982-1989, 1997.

V. Abstracts

Benz, F.W., Chen, T.S., Srinivasan, C., Corbett, D., and Li, J. Effect of acute acrylonitrile intoxication on tissue glutathione status in rats. *1997 Society of Toxicology Annual Meeting*, Cincinnati, OH, March 1997.

Li, J., Nerland, D.E., Feldhoff, R.C., and Benz, F.W. Identification of the predominant site of covalent attachment of acrylonitrile to hemoglobin in the rat. *Proceedings of the Twenty-Third Annual Student Research Day*, University of Louisville Health Sciences Center, October, 1997.

Han, S., and Carr, L.A. Mechanisms involved in the regulation of the striatal dopamine transporter (DAT). *The Pharmacologist* **39**, 89, 1997.

Srinivasan, C., Chen, T.S., and Williams, W.M**.** Prevention of diethylmaleate-induced hepatic glutathione depletion by n-propylthiazolidine carboxylic acid in the mouse. *The Toxicologist* **36**, 80, 1997.

Benz, F.W., Chen, T.S., Srinivasan, C., Corbett, D., and Li, J. Effect of acute acrylonitrile intoxication on tissue glutathione status in rats. *The Toxicologist* **36**, 80, 1997.

Fretland, A.J., Feng, Y., and Hein, D.W. DNA adduct formation in male rapid and slow acetylator congenic hamsters and inbred rats administered 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP). *Proceedings of the Twenty-Third Annual Student Research Day,* University of Louisville Health Sciences Center, October, 1997.

Fretland, A.J., Feng, Y., and Hein, D.W. DNA adduct formation in male rapid and slow acetylator congenic hamsters and inbred rats administered 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP). *Proceedings of the Ohio Valley Society of Toxicology,* Cincinnati, Ohio, November, 1997.

Cai, J. and Hurst, H.E. Quantitation by GC/MS of N-(carboxymethyl)valine adduct in hemoglobin. *36th Annual Meeting, Society of Toxicology*, Cincinnati, OH, March 9-13, 1997.

Cai, J., Benz, F.W., Nerland, D.E., Li, J., Corbett, D., and Hurst, H.E. The nonlinear dose-dependent toxicodynamics of acrylonitrile can be explained by the similar dose-dependence of its toxicokinetics. *Proceedings of the Twenty-Third Annual Student Research Day,* University of Louisville Health Sciences Center, October, 1997.

Kang, Y.J. Suppression of doxorubicin-induced apoptosis in the metallothionein overexpressing heart of transgenic mice. *Proc. Am. Assoc. Cancer Res.* **38**, 192, 1997.

Kang, Y.J., and Chen, Y. Acquired resistance of catalase-overexpressing transgenci mouse heart to oxidative injury. Presented at the *4th Annual Meeting of the Oxygen Society*, San Francisco, CA, 1997.

Kang, Y.J. Cardiac specific overexpression of metallothionein protects the heart from oxidative injury. Presented at the *4th Annual Meeting of the Oxygen Society*, San Francisco, CA, 1997.

Kang, Y.J., Chakrabarti, S., and Cherian, M.G. Cellular and subcellular localizations of overexpressed human metallothionein II in the heart of transgenic mice. *Fund. Appl. Toxicol. (Toxicologist),* **36**, 245, 1997.

Chen, Y., Saari, J.T., and Kang, Y.J. Inhibition of hypoxia-reoxygenation injury in the heart of catalase overexpressing transgenic mice. *Fund. Appl. Toxicol. (Toxicologist),* **36**, 109, 1997.

Alexander, J.M., Saari, J.T., and Kang, Y.J. Alterations in expression of antioxidant enzymes in the heart of rats fed copper deficient diet. *Fund. Appl. Toxicol. (Toxicologist),* **36**, 47, 1997.

Kang, Y.J. Metallothionein provides cardioprotection against ischemia-reperfusion injury. Presented at *The Fourth International Metallothionein Meeting*, Kansas City, MO, 1997.

Wang, G.-W., and Kang, Y.J. Inhibition of adriamycin toxicity in cultured neonatal mouse heart cells with elevated metallothionein levels. Presented at *The Fourth International Metallothionein Meeting*, Kansas City, MO, 1997.

Wang, J.F., and Kang, Y.J. Induction of metallothionein in mouse heart by ischemic preconditioning. Presented at *The Fourth International Metallothionein Meeting*, Kansas City, MO, 1997.

Wu, H.y., and Kang, Y.J. Cardiac metallothionein overexpressing transgenic mice are resistant to buthionine sulfoximine-enhanced doxorubicin cardiac toxicity. Presented at *The Fourth International Metallothionein Meeting*, Kansas City, MO, 1997.

Weeks, J., Myers, S.R., Lasher, J., Goldsmith, C., Watkins, C., Spinnato, J., and Gall, S. Persistence of benzathine penicillin in pregnant group B strep carriers. *Society of Perinatal Obstetricians*, Anaheim, CA, January 20, 1997.

Gagel, J.R., Myers, S.R., Quiggins, P.A., Cai, J., and Tamburro, C.H. Use of hemoglobin adducts for monitoring acrylonitrile exposure in residential and industrial populations. *Society of Toxicology*, Cincinnati, OH, Abstract #862, March 9-13, 1997.

Myers, S.R., Pinorini-Godly, M.T., Spinnato, J.A., Jordan, J., and Gairola, C.G. Formation and loss of the 4-aminobiphenyl hemoglobin adducts in rats exposed to sidestream cigarette smoke. *Society of Toxicology,* Cincinnati, OH, Abstract #1684, March 9-13, 1997.

Spinnato, J.A. and Myers, S.R. Enzyme kinetics and metabolite identification using a rat microsomal assay following tetryl administration. *Proceedings of the Twenty-Third Annual Student Research Day,* University of Louisville Health Sciences Center, October, 1997.

Costa, D., Myers, S.R., and Lewtas, J. Influence of metabolic genotypes on urinary PAH metabolites as markers of PAH exposure. *The 16th International Symposium on Polycyclic Aromatic Hydrocarbons*, November, 1997.

Pierce, W.M., Jr., Rueff, D.E., Smith, N.B., and Rodgers, G.C., Jr. Blood lead concentraions in the children of Jefferson County, Kentucky. Presented at the *The Annual Meeting of the Kentucky Academy of Sciences*, November, 1997.

Rowell, P.P. Long-lasting inactivation of nicotinic receptor function *in vitro* by prolonged treatment with high nicotine concentrations. *Society for Neurosci.* **23**, 917, 1997.

VI. Invited Scientific Presentations and Seminars

Hein, D.W. "Acetyltransferases and genetic predisposition to cancers from aromatic and heterocyclic amines." Department of Pharmaceutical Sciences, Wayne State University, Detroit, MI, October, 1997.

Hein, D.W. "Pharmacogenetics of N-acetyltransferases: implications for genetic predisposition to cancer from aromatic amines." Department of Pharmacology, University of Michigan, Ann Arbor, MI, October, 1997.

Hein, D.W. "Pharmacogenetics of N-acetyltransferases: implications for genetic predisposition to cancer from aromatic and heterocyclic amine carcinogens." Bicentennial Seminar Series, Center for Genetics and Molecular Medicine, University of Louisville Health Science Center, Louisville, KY, December, 1997.

Kang, Y.J. "Metallothionein and cardiac oxidative injury." Research Division, Procter & Gamble Pharmaceuticals Inc., Cincinnati, OH, September 30, 1997.

Kang, Y.J. "Suppression of cardiac toxicity of doxorubicin in the metallothionein overexpressing heart of transgenic mice." Plenary Lecture, the Second National Congress of Chinese Society of Toxicology, Xi'an, China, May 14, 1997.

Kang, Y.J. "Transgenic approach to cardiac protection against copper deficiency induced oxidative injury." Multidisciplinary Graduate Program in Nutritional Sciences, University of Kentucky, Lexington, KY, February 26, 1997.

Kang, Y.J. "Experimental approaches to selective modulation of doxorubicin cardiotoxicity and drug resistance in cancerous cells." Department of Biochemistry, University of Louisville, Louisville, KY, February 17, 1997.

Kang, Y.J. "Transgenic approach to cardiac oxidative injury and protection." Graduate Center for Toxicology, University of Kentucky, Lexington, KY, February 10, 1997.

Kang, Y.J. "Oxidative injury and protection in transgenic mouse heart overexpressing antioxidants." Department of Anatomical Sciences and Neurobiology, University of Louisville, Louisville, KY, February 3, 1997.

Kang, Y.J. "Cardiac catalase and oxidative injury." Department of Physiology and Biophysics, University of Louisville, Louisville, KY, January 14, 1997.

Pierce, W.M., Jr. "Bone targeted steroids." Kowa Company, Ltd., Tokyo, Japan, December, 1997.

Pierce, W.M., Jr. "Development of bone targeted carbonic anhydrase inhibitors for medical management of osteoporosis." Tianjin Medical University, Tianjin, P.R. China, December, 1997.

Pierce, W.M., Jr. "Effects of novel and classical carbonic anhydrase inhibitors on intraocular pressure in animal studies: Possible topical drugs for glaucoma." Tianjin Pharmacological Society, Tianjin, P.R. China, December, 1997.

Rowell, Peter P. "Nicotine-induced neurotransmitter release in the brain: Concentration- and time-dependent modulatory effects." Department of Behavioral Genetics, University of Colorado, Boulder, CO, April 18, 1997.

Rowell, Peter P. "Nicotinic receptor function." Nicotine Research Roundtable, ASAM conference on Nicotine Dependence, Minneapolis, MN, October 16, 1997.

Waddell, W.J. "Epidemiological effects of environmental estrogens." Sigma Xi, Louisville Chapter lecture, January 8, 1997.

Waddell, W.J. "Multiple chemical sensitivity." Training session of Ashland Petroleum Company Refinery Health and Safety Committees, April 22, 1997.

Waddell, W.J. "Effects of environmental estrogens: epidemiological studies." Kuwait University Faculty of Medicine, Department of Pharmacology and Toxicology, March 24, 1997.

Waddell, W.J. "Epidemiological studies on the effects of environmental estrogens." Presented at the Fall Meeting of the Ohio Valley Chapter of the Society of Toxicology, November 7, 1997.

Waddell, W.J. "Evidence against environmental endocrines influencing cancer of the breast, Uterus, Prostate and Testicle." Conference on Human Diet and Endocrine Modulation, Estrogenic and Androgenic Effects. Sponsor: International Life Science Institute of North America (ILSI), November 20, 1997.

VII. Research Grants and Contracts

A. Research Grant and Contract Proposals Submitted

	Agency	Direct	w/Indirect Total
Dr. Frederick W. Benz			
Acute Acrylonitrile Intoxication: Antidotal Assessment (P.I.)	NIH-NIEHS	$105,432	$152,876
Acute Acrylonitrile Intoxication: Antidotal Assessment-Suppl (P.I.)	NIH-NIEHS	$7,908	$7,908
Dr. Laurence A. Carr			
An Immunomodulatory Role for Brain Dopamine Systems (P.I.)	SOM Research Committee	$13,477	$13,477

	Agency	Direct	w/Indirect Total
Dr. Theresa S. Chen			
Acute Acrylonitrile Intoxication: Antidotal Assessment (Co-I. w/Dr. Benz)	NIH-NIEHS	$105,432	$152,876
Acute Acrylonitrile Intoxication: Antidotal Assessment-Suppl (Co-I. w/Dr. Benz)	NIH-NIEHS	$7,908	$7,908
Enhancement of hepatic Glutathione Synthesis on Prevention of Acetaminophen-Induced Liver Toxicity by a new Class of Drugs (Co-I. w/Dr. Williams)	Alliant	$39,751	$39,751
Enhancement of Hepatic Glutathione Production (Co-I. w/Dr. Williams) – 3 years	NIH	$317,056	$450,673
Dr. David W. Hein			
Pharmacogenetics of Drug and Carcinogen Metabolism (P.I.) – 5 years	NIH-NCI	$1,290,345	$1,859,936
Metabolic Basis of Sulfonamide Toxicity in AIDs patients (P.I.) – 3 years	NIH-Subcontract from Wayne State	$55,688	$80,349
Dr. Harrell E. Hurst			
Louisville Environmental Prevention/Intervention Program (Co-I. w/Dr. Prough) - multiyear	NIH-NIEHS	$992,152	
Pharmacogenetics of Fetal Tobacco Smoke Exposure (Co-I. w/Dr. Myers) – 3 years	NIH	$510,435	$729,646
Acute Acrylonitrile Intoxication: Antidotal Assessment (Co-I. w/Dr. Benz)	NIH	$105,432	$152,876

	Agency	Direct	w/Indirect Total
1997 WHAS Crusade for Children Drug Testing Equipment Request (P.I.)	WHAS	$98,282	$98,282
Dr. Y. James Kang			
Cardiac Metallothionein and Adriamycin Toxicity (P.I.) - multiyear	NIH	$146,824	$206,410
Butylated Hydroxyanisole-Mediated Hypercholesterolemia (P.I.) - multiyear	USDA	$202,232	$230,545
Metallothionein and Adriamycin Cardiotoxicity (P.I.) - multiyear	NIH	$436,000	$623,000
Metallothionein and Mycocardial Preconditioning (P.I.) - multiyear	NIH	$458,000	$660,000
Dr. Steven R. Myers			
Protein Adducts as Ecological Exposure Markers; Use of GC/MS and Capillary Electrophoresis to Quantify Hemoglobin Adducts of Nitroaromatic Munitions Chemicals (P.I.)	EPA	$46,270	$49,972
DMBA Hemoglobin Adducts (P.I.)	McKesson	$15,751	$19,500
Maternal and Fetal Exposure to Tobacco Smoke (P.I.) – 2 years	NIH	$165,523	$235,058
Pharmacogenetics of Fetal Tobacco Smoke Exposure (P.I.) – 3 years	NIH	$510,435	$729,646
Dr. Donald E. Nerland			
Acute Acrylonitrile Intoxication: Antidotal Assessment (Co-I. w/Dr. Benz)	NIH-NIEHS	$105,432	$152,876

	Agency	Direct	w/Indirect Total
Acute Acrylonitrile Intoxication: Antidotal Assessment-Suppl (Co-I. w/Dr. Benz)	NIH-NIEHS	$7,908	$7,908
Dr. William M. Pierce, Jr.			
Bone Targeting of Pharmaceutical Agents for Osteoporosis (P.I.)	KOWA	$255,238	$315,985
Aging Induced Renal Dysfunction: G Protein Activity (Co-I. w/Dr. John Passmore- multiyear	NIH	$207,383	$297,465
Riverine Food Webs and Their Roles in Contaminant Transport (Co-I. w/Dr. Bukaveckas) - multiyear	EPA-EPSCoR	$168,500	$168,500
Dr. Peter P. Rowell			
Functional Activity of Presynaptic Nicotinic Receptors (P.I.)	NIH	$60,489	$87,709
Dr. Leonard C. Waite			
Bone Targeting of Pharmaceutical Agents for Osteoporosis (Co-I. w/Dr. Pierce)	KOWA	$255,238	$315,985
Dr. Walter M. Williams			
Enhancement of Hepatic Glutathione Synthesis and Prevention of Acetaminophen-Induced Liver Toxicity by a New Class of Drugs (γ-glutamyl cysteine precursors) (P.I.)	Alliant	$39,751	$39,751
Enhancement of Hepatic Glutathione Production (P.I.) – 3 years	NIH	$317,056	$450,673

B. Research Grants and Contracts in Force

	Agency	Direct	w/Indirect Total
Dr. Frederick W. Benz			
Acute Acrylonitrile Intoxication: Antidotal Assessment (P.I.)	NIH-NIEHS	$103,930	$150,699
Acute Acrylonitrile Intoxication: Antidotal Assessment-Suppl (P.I.)	NIH-NIEHS	$7,908	$7,908
Dr. Theresa S. Chen			
Acute Acrylonitrile Intoxication: Antidotal Assessment (Co-I. w/Dr. Benz)	NIH-NIEHS	$103,930	$150,699
Acute Acrylonitrile Intoxication: Antidotal Assessment-Suppl (Co-I. w/Dr. Benz)	NIH-NIEHS	$7,908	$7,908
Glutathione Status and Lipid Peroxidation in Chronic Toxicity (P.I.)	ULCHES-NIEHS	$16,000	$16,000
Dr. David W. Hein			
Pharmacogenetics of Drug and Carcinogen Metabolism (P.I.) – 5 years	NIH-NCI	$1,290,345	$1,859,936
Metabolic Basis of Sulfonamide Toxicity in AIDs patients (P.I. on subproject) – 3 years	NIH-Subcontract from Wayne State	$55,688	$80,349
Dr. Harrell E. Hurst			
Acute Acrylonitrile Intoxication: Antidotal Assessment-Suppl (Co-I. w/Dr. Benz)	NIH-NIEHS	$103,930	$150,699
Acrylonitrile Biomonitoring:Model Chemical Biomarkers II (P.I.)	ULCEHS-NIEHS	$12,500	$12,500

	Agency	Direct	w/Indirect Total
Environmental Hazards to Reproductive Health (Co-I. w/Dr. Hendler) – 3 years	VA	$949,100	$949,100
1997 WHAS Crusade for Children Drug Testing Equipment (P.I.)	WHAS	$80,000	$80,000
UofL NIEHS Developmental Center Grant (Co-I. w/Dr. Prough) – 3 years	NIH-NIEHS	$525,000	$763,326
HPLC Electrospray Mass Spectrometer (Co-I. w/Dr. Pierce)	NIH-NCI	$307,954	$307,954
Agreement for Drug Screening	UofL Athletics Association	$37,500	$37,500
Dr. Y. James Kang			
Effect of Catalase on Adriamycin Cardiotoxicity (P.I.) – multiyear	NIH-NCI	$168,671	$244,573
Suppression of Cardiac Ischemia-Reperfusion Injury by Over-expression of Metallothionein (P.I.) – 3 years	AHA	$272,925	$298,200
The Role of Catalase in Protection Against Copper Deficiency-Induced Heart Damage in Transgenic Mice – multiyear	USDA	$94,493	$106,253
Dr. Steven R. Myers			
Protein Adducts as Ecological Exposure Markers: Use of GC/MS and Capillary Electrophoresis to Quantify Hemoglobin Adducts of Nitroaromatic Munitions Chemicals (P.I.)	USEPA	$46,270	$49,972
Hemoglobin Adducts of 7,12-dimethylbenz(a)anthracene (DMBA) (P.I.)	NCI-McKesson	$15,751	$19,500

	Agency	Direct	w/Indirect Total
In Utero and Postnatal Tobacco Smoke Exposure and its Effects on Infant Lung Function and Respiratory Illness (Co-I. w/Dr. Ross) – 3 years	Alliant	$203,890	$203,890
Dr. Donald E. Nerland			
Acute Acrylonitrile Intoxication: Antidotal Assessment (Co-I. w/Dr. Benz)	NIH-NIEHS	$103,930	$150,699
Acute Acrylonitrile Intoxication: Antidotal Assessment-Suppl (Co-I. w/Dr. Benz)	NIH-NIEHS	$7,908	$7,908
Dr. William M. Pierce, Jr.			
Bone Targeting of Pharmaceutical Agents for Osteoporosis (P.I.)	KOWA	$255,238	$319,985
HPLC Electrospray Mass Spectrometer (P.I.)	NIH	$307,954	$307,954
Blood Lead Monitoring (P.I.)	Regional Practitioners	$21,637	$21,637
Combinatorial Libraries of Bisphosphonates for Osteoporosis (Co-I. w/Dr. Taylor)	UofL Research on Women Program	$3,000	$3,000
Dr. Peter P. Rowell			
Functional Activity of Presynaptic Nicotinic Receptors (P.I.)	NIH	$59,413	$86,149
Dr. Leonard C. Waite			
Bone Targeting of Pharmaceutical Agents for Osteoporosis (Co-I. w/Dr. Pierce)	KOWA	$255,238	$315,985

VIII. Summary of Teaching Activities

A. School of Medicine

The Department team-taught the Medical Pharmacology course to second year medical students. Dr. Laurence Carr served as course director. Individual faculty contributions are identified in the Appendix.

B. 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.

C. School of Nursing

The Department team-taught a Basic Pharmacology for Nursing course to second year nursing 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.

D. 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.

E. 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)
Toxicology (Dr. Harrell Hurst)

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

Five graduate students completed the graduate program in 1997. Their names, degrees and faculty advisors are:

Chandrika Srinivasan (Ph.D. awarded May, 1997; Mentor: Dr. Theresa Chen)
Sue Han (Ph.D. awarded August, 1997; Mentor: Dr. Laurence Carr)
Mary Li (Ph.D. awarded August, 1997; Mentor: Dr. Avital Schurr)
Qiang Wu (Ph.D. awarded August, 1997; Mentor: Dr. William Pierce)
Emiko Hatcher Kreklau (Ph.D. awarded December, 1997; Mentor: Dr. James Kang)

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

IX. Summary of Service Activities

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.

X. Honors and Awards

1. David W. Hein was appointed Distinguished University Scholar at the University of Louisville and Distinguished Visiting Professor at the University of North Dakota.

2. Walter M. Williams received the Golden Apple Award for Teaching by the University of Louisville School of Medicine, Class of 1999.

3. William J. Waddell was appointed Chairman Emeritus.

XI. Appendix

Individual reports for all primary and salaried faculty members are attached.