

CURRICULUM VITAE

(updated Nov 2007)

Hong Zhu, MD
Research Assistant Professor



PERSONAL DATA

Date & Place of Birth: 10/06/1964, Shandong, China

Citizenship: USA

Marital Status: Married with two children (Jason, Rachel)

Business Address:

Division of Biomedical Sciences
Virginia College of Osteopathic Medicine
Virginia Tech CRC Research Building II
1861 Pratt Drive
Blacksburg, VA 24060
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CURRENT RESEARCH AREAS AND INTERESTS

- Cardiovascular Physiology and Medicine
- Molecular and Cellular Pharmacology/Toxicology
- Biochemistry and Molecular Regulation of Phase 2 Enzymes
- Transgenic and Gene-Knockout Animals
- Oxygen Radicals in Disease Process
- Drug Development for Intervention of Oxidative Tissue Degeneration

TEACHING INTERESTS

- Human Physiology
- General Biology, Biochemistry, and Molecular & Cell Biology
- Medical Toxicology/Pharmacology

EDUCATION

April 1994 - September 1998

Postdoctoral Fellow

Division of Toxicological Sciences, The Johns Hopkins University
School of Hygiene and Public Health, Baltimore, MD.

Mentor: Michael A. Trush, PhD, Professor

Areas of Research: Biochemical and Molecular Toxicology; Free
Radical Biology; Cell Biology

September 1988 - May 1991

MS in Toxicology and Environmental Medicine

School of Public Health, Shandong Medical University, Shandong,
China.

Mentor: Tian Ding, MD, Professor

Areas of Research: Biochemical & Genetic Toxicology, Cell Biology

September 1983 - July 1984

Intern (Clinical Medicine)

The Qianfu Mountain Hospital of Jinan, Shandong, China.

September 1980 - July 1985

Doctor of Medicine

Shandong Medical University, Shandong, China.

PROFESSIONAL POSITIONS

January 2007-

Research Assistant Professor of Biomedical Sciences/Pharmacology

Division of Biomedical Sciences

Virginia College of Osteopathic Medicine

Virginia Tech CRC Research Building II

1861 Pratt Drive

Blacksburg, VA 24060

Full-time employment

January 2005-October 2006

Research Scientist with Principal Investigator Status

Davis Heart and Lung Research Institute

Sponsored laboratory: Dr Yunbo Li's Laboratory at DHLRI

The Ohio State University Medical Center, Columbus, OH

Areas of Research: Transgenic Animals; Cardiovascular Medicine;

Oxidative Stress and Antioxidants in Disease Process;

Biochemistry & Molecular Biology of Phase 2 Enzymes

Full-time employment

August 2004-December 31, 2004

Research Scientist

Department of Pharmaceutical Sciences
St. John's University College of Pharmacy, Queens, NY
Areas of Research: Transgenic Animals; Cardiovascular Medicine;
Oxidative Stress and Antioxidants in Disease Process;
Biochemistry & Molecular Biology of Phase 2 Enzymes
Full-time employment

January 2004-July 2004

Research Associate

Laboratory of Cardiovascular Research
North Shore-Long Island Jewish Research Institute
North Shore University Hospital, NY
Areas of Research: Pulmonary physiology; Molecular Biology;
Oxidative Stress and Antioxidants in Pulmonary Disease
Full-time employment

May 2000 - November 2003

Research Associate

Laboratory of Molecular Biology
GENSAT Project
The Rockefeller University, New York, NY
Areas of Research: Molecular Biology; Neuroscience
Full-time employment

September 1998 - January 2000

Research Associate and Faculty Member

Division of Toxicological Sciences, The Johns Hopkins University
School of Hygiene and Public Health, Baltimore, MD
Areas of Research: Biochemical and Molecular Toxicology; Free
Radical Biology; Cell Biology
Full-time employment

November 1992 - April 1994

Senior Lab Research Assistant

Division of Toxicological Sciences, The Johns Hopkins University
School of Hygiene and Public Health, Baltimore, MD
Areas of Research: Biochemical and Molecular Toxicology; Free
Radical Biology; Cell Biology
Full-time employment

May 1991 - March 1992

Hygienist & Microbiologist

Zhaozhuang Institute of Hygiene, Shandong, China
Areas of Profession: Microbiology; Food Nutrition & Toxicology
Full-time employment

July 1985 - August 1988

Core Faculty, Lecturer

Shandong Medical University, Jinan, Shandong, China

Areas of Research: Biochemical and Genetic Toxicology;
Microbiology

Areas of Teaching: Environmental Health; Environmental
Toxicology; Microbiology & Cell Biology; Physiology

Full-time employment

RESEARCH EXPERIENCE

September 1988 - May 1991

Graduate Research Fellow

Shandong Medical University, Jinan, China

Research Projects:

- Genotoxic effects of chromium and other environmental toxicants
- Immunotoxicity of chlorobudiene

November 1992 - April 1994

Senior Lab Research Assistant

The Johns Hopkins University School of Hygiene and Public Health,
Baltimore, MD

Research Projects:

- Isolation and primary culture of bone marrow stromal cells
- Myeloid cell differentiation to macrophages and neutrophils
- Characterization of xenobiotic metabolism enzymes and their induction by dithiolethiones in human myeloid progenitor cells and bone marrow stromal cells derived from mice and rats
- *In vitro* studies on the molecular mechanisms involved in benzene- and benzo(a)pyrene-induced hematotoxicities

April 1994 - September 1998

Postdoctoral Fellow

The Johns Hopkins University School of Hygiene and Public Health,
Baltimore, MD

Research Projects:

- Chemoprotective effects of dithiolethiones on hydroquinone-induced toxicity
- Free radical mechanism of phenolic compound metabolism and toxicities
- ESR spin trapping measurement of free radicals (in collaboration with Drs P. Kuppusamy and J.L. Zweier)
- Effects of xenobiotics on mitochondrial function and biogenesis

September 1998 - January 2000

Faculty Member, Research Associate

The Johns Hopkins University School of Hygiene and Public Health,
Baltimore, MD

Research Projects

- Development of chemiluminescent methods for detecting mitochondrial reactive oxygen species
- Mitochondria-mediated redox cycling of benzo(a)pyrene-derived quinones and its role in mononuclear cell dysfunction
- Somatic mutation of mitochondrial DNA in colon cancer (in collaboration with Dr Bert Vogelstein)
- Obesity, UCP-2, TNF and mitochondrial reactive oxygen production in immune cells and hepatocytes (in collaboration with Drs Janet Lee and Ann M. Diehl)
- Mitochondrial adaptations to obesity-related oxidant stress (in collaboration with Drs Shiqi Yang and Ann M. Diehl)
- Mitochondrial ROS and reproductive dysfunction (in collaboration with Drs H. Chen and B. Zirkin)

May 2000 - November 2003

Research Associate

Laboratory of Molecular Biology

GENSAT Project

The Rockefeller University, New York, NY

Research Projects

- Utilization of the genomic databases to design sequences for cloning and to identify the appropriate Bacterial Artificial chromosome (BAC) clones
- Making BAC reporter gene constructs by homologous recombination technique

January 2004-July 2004

Research Associate

Laboratory of Cardiovascular Research

North Shore-Long Island Jewish Research Institute

North Shore University Hospital, NY

Research Projects

- Role of NF- κ B in apoptosis signaling in cultured cells
- Role of neutrophils in oxidative lung injury in animals

August 2004-December 2004

Research Scientist

Department of Pharmaceutical Sciences

St. John's University College of Pharmacy, NY

- Role of Nrf2 signaling in antioxidative/phase 2 gene expression in cardiovascular tissues
- Phenotypic characterization of Nrf2-null mice
- Transgenic animal models, breeding, and genotyping

January 2005-October 2006

Research Scientist with Principal Investigator Status

Davis Heart and Lung Research Institute

The Ohio State University Medical Center, Columbus, OH

- Chemical induction of antioxidative/phase 2 enzymes and cardiovascular protection
- Chemical induction of antioxidative/phase 2 enzymes and chemoprotection against diabetes
- Role of Nrf2 signaling in antioxidative/phase 2 gene expression in cardiovascular tissue and pancreas
- Phenotypic characterization of nrf2-null mice
- Transgenic animal models, breeding, and genotyping

January 2007-

Research Assistant Professor

Division of Biomedical Sciences

Virginia College of osteopathic Medicine, Virginia Tech CRC,

Blacksburg, VA

- Induction of antioxidative/phase 2 enzymes by nutraceuticals and cardiovascular protection
- Induction of antioxidative/phase 2 enzymes by nutraceuticals and chemoprotection against inflammatory bowel disease
- Role of Nrf2 signaling in antioxidative/phase 2 gene expression in cardiovascular tissue, pancreas, kidney, and gut
- Phenotypic characterization of nrf2-null mice
- Transgenic animal models, breeding, and genotyping

SKILLS AND TECHNIQUES

Tissue and cell cultures: long term cell cultures, primary cell cultures, including bone marrow cells, myeloid progenitor cells, monocytes/macrophages, breast cells, lung cells and skin cells. Analytical biochemistry techniques: enzymatic assays, ELISA, measurement of biomolecules, spectrophotometric detection and HPLC detection of chemicals extracted from cells and organelles.

Molecular biology techniques: nucleic acid isolation (DNA, RNA) and purification, Northern blot, Southern blot, immunoblot (Western blot), nucleic acid hybridization, polymerase chain reaction (PCR), cloning technique, making competent cells, making bacterial artificial chromosome (BAC) constructs, preparation of BAC DNA by CsCl gradient method, DNA electrophoresis, protein purification and electrophoresis, mitochondrial genome encoded protein synthesis, antisense, and iRNA techniques.

Oxygen electrode techniques: Clark-type oxygen electrode, oxygen polarography, measurement of cellular and mitochondrial oxygen consumption.

Fluorescent and chemiluminescent techniques: fluorescent detection of enzymatic activity and biomolecules, fluorescent detection of intracellular reactive oxygen species, chemiluminescent detection of cellular and mitochondrial reactive oxygen species.

Radioactive isotope techniques: handling of isotopes including ^3H , ^{35}S , ^{32}P , ^{33}P .

In vivo animal studies: short and long term in vivo experiments with mice and rats, anatomy of mice and rats, exposure of animals to chemicals via inhalation, intravenous injection, subcutaneous injection; transgenic animals; transgenic animal breeding and genotyping

Immunohistochemistry and histochemistry techniques: microscopic slide preparation, routine and special staining techniques, fluorescent microscopic techniques.

Data analysis and computer skills: statistical methods, utilization of genomic databases, Microsoft Office, computer drawing, etc.

TEACHING EXPERIENCE

1985.8-1988.9

Lecturer, Core Faculty
Shandong Medical University

Core-Courses taught:

Environmental Medicine (for medical students)
Environmental Toxicology (for medical students)
Microbiology and Cell Biology (for medical students)

Laboratory Courses taught:

Laboratory Microbiology (for medical students)
Laboratory Physiology (for medical students)

2004.8-2004.12

Research Scientist
St. John's University College of Pharmacy and Allied Health professions

Gave two invited lectures for the undergraduate course, "Principles of Toxicology"

Topics covered: Mitochondrial toxicology; Biochemical mechanisms of toxic cell injury

PROFESSIONAL ACTIVITIES

Mentor of Undergraduate Students Doing Laboratory Research

1988-1991

Shandong Medical University School of Public Health

Mentored several undergraduate students doing laboratory research in environmental toxicology and microbiology

1992-2000

The Johns Hopkins University School of Hygiene and Public Health

Mentored a few undergraduate students doing summer research in Dr. Mike Trush Lab of the Division of Toxicological Sciences

2007-

Virginia College of Osteopathic Medicine

Mentoring a medical student for doing laboratory research

Experience in Supervising/Training Graduate Students and Junior Postdoctoral Fellows

1994-2000

The Johns Hopkins University School of Hygiene and Public Health
Supervised and trained several graduate students and junior postdoctoral fellows in Dr. Mike Trush Lab of the Division of Toxicological Sciences

2005-2006

Davis Heart & Lung Research Institute, The Ohio State University Medical Center
Supervised and trained several graduate students and junior postdoctoral fellows at Davis Heart & Lung Research Institute

Seminars

September 1988

"Oxygen Radicals and Chromium Toxicity in Human Cells"
Shandong Medical University

October 1994

"Oxidative Stress and NFκB Activation"

Division of Toxicological Sciences, Department of Environmental Health Sciences, The Johns Hopkins University School of Hygiene and Public Health

November 1995

"Molecular Mechanisms of Benzene Toxicity"

Division of Toxicological Sciences, Department of Environmental Health Sciences, The Johns Hopkins University School of Hygiene and Public Health

February 1998

"Mitochondrial Dysfunction in Environmental Toxicology"

Division of Toxicological Sciences, Department of Environmental Health Sciences, The Johns Hopkins University School of Hygiene and Public Health

Invited Reviewer for Peer-reviewed Journals

- *American Journal of Physiology*
- *Cardiovascular Toxicology*
- *Food and Chemical Toxicology*
- *Pharmacological Research*
- *Toxicology Letters*

Professional Meeting Presentations

- Research Recognition Day, VCOM, Blacksburg, 2007
- Annual Meeting of the Society of Toxicology, Charlottesville, 2007
- Annual Meeting of the Society of Toxicology, New Orleans, 2005
- Annual Meeting of the Oxygen Society, Washington, D.C., 1998
- Annual Meeting of the Oxygen Society, San Francisco, 1997
- Annual Meeting of the Society of Toxicology, Baltimore, 1995
- Annual Meeting of the Society of Toxicology, Dallas, 1994

HONORS AND AWARDS

- Annual Medical Student Scholarship 1980-1984
- Thesis Award, Shandong Academy of Medical Sciences, 1988
- Environmental Toxicology Research Fund of Shandong Province, Shandong, 1991

EXTRAMURAL GRANTS

AWARED

1. R01, HL71190, National Heart, Lung, and Blood Institute, National Institutes of Health
Co-Investigator (PI: Li, Yunbo)
April 1, 2004-March 31, 2008 (\$875,000)
Title of grant: *Induction of Cellular Antioxidants and Cardioprotection*
2. Harvey W. Peters Research Center Foundation
Co-Investigator (PI: Li, Yunbo)
April 1, 2008- March 30, 2009 (\$60,000)
Title of grant: Myocardial Salvage via Nrf2-dependent Endogenous Antioxidant Defenses

PENDING AND SUBMITTED

1. R01, (1R01HL085336-01) National Heart, Lung, and Blood Institute, National Institutes of Health
Co-Investigator (PI: Li, Yunbo)
Title of grant proposal: Vascular Antioxidants/Phase 2 Enzymes: Chemical Induction and Vasoprotection
Amount requested: \$1,935,056
SRG: 183-Council decision pending
2. Senior Research Award, CCFA
Co-Investigator (PI: Li, Yunbo)
Title of grant proposal: Nrf2 as a Novel Target for IBD Intervention
Amount requested: \$429,000
Revised application submitted: July 1, 2007
3. Investigator Initiated Grant (IIG), American Institute for Cancer Research
Co-Investigator (PI: Li, Yunbo)
Title of grant proposal: Enhancement of doxorubicin therapy via protecting against chronic heart failure by a unique nutraceutical
Amount requested: \$165,000
Submitted: July 1, 2007
4. R21 (1R21 HL093557-01), National Heart, Lung, and Blood Institute
Co-Investigator (PI: Li, Yunbo)
Title of grant proposal: Myocardial salvage via coordinated induction of cardiac antioxidants

Amount requested: \$419,925
Submitted: October 16, 2007

5. R15 (1R15 DK081905-01), National Institute of Diabetes and Digestive and Kidney Diseases
Principal Investigator: Zhu, Hong
Title of grant proposal: Renal salvage via Nrf2-dependent antioxidative/anti-inflammatory enzymes
Amount requested: \$229,050
Submitted: October 25, 2007

6. R21, (1R29 DK077685-01A1), National Institute of Diabetes and Digestive and Kidney Diseases
Co-Investigator (PI: Li, Yunbo)
Title of grant proposal: IBD Chemoprotection via Nrf2-dependent Antioxidative Enzymes
Amount requested: \$419,925
Resubmitted: November 16, 2007

PUBLICATIONS - PEER-REVIEWED JOURNAL ARTICLES

1. **Zhu H**, Ding, T. The determination of glycogen in white blood cells in humans exposed to benzene. **Shandong Med Sci** 23:49-50, 1987.
2. Li Y, Chu Y, **Zhu H**, Qiao C. Toxic effects of chlorobutadiene on the macrophages of rat and mouse. **Chinese J Pharmacol Toxicol** 2:57-60, 1988.
3. Li Y, Qiao C, **Zhu H**, Si Y. Toxic effects chlorobutadiene inhalation on the bone marrow in mice. **J Health Toxicol** 2:139-142, 1988.
4. Wang F, Ding T, **Zhu H**, Liu C, Li J, Peng C. Mutagenic effects of water of Daming Lake. **Acta Academiae Medicine Shandong** 27:48-50, 1989.
5. Wang F, Ding T, Liu C, Li J, **Zhu H**. Mutagenic effects of the particulates in the main stream smoke and of saliva in cigarette smokers. **Environ Health** 6:32-33, 1989.
6. **Zhu H**, Li Y, Trush MA. Characterization of benzo(a)pyrene quinone-induced toxicity to primary cultured bone marrow stromal cells from DBA/2 mice: potential role of mitochondrial dysfunction. **Toxicol Appl Pharmacol** 130:108-120, 1995.

7. **Zhu H**, Li Y, Trush MA. Difference in xenobiotic detoxifying activities between bone marrow cells from mice and rats: implications for benzene-induced hematotoxicity. **J Toxicol Environ Health** 46:183-201, 1995.
8. Trush MA, Twerdok LE, Rembish SJ, **Zhu H**, Li Y. Analysis of target cell susceptibility as a basis for the development of a chemoprotective strategy against benzene-induced hematotoxicities. **Environ Health Perspect** 104:1227-1233, 1996.
9. Li Y, **Zhu H**, Kuppusamy P, Roubaud V, Zweier JL, Trush MA. Validation of lucigenin (bis-N-methylacridinium) as a chemilumigenic probe for detecting superoxide anion radical production by enzymatic and cellular systems. **J Biol Chem** 273:2015-2023, 1998.
10. Polyska K, Li Y, **Zhu H**, Lengauer C, Willson JKV, Markowitz, SD, Trush MA, Kinzler KW, Vogelstein B. Somatic mitochondrial DNA mutation in human colon cancer. **Nature Genetics** 20:291-293, 1998.
11. Lee F-Y, Li Y, **Zhu H**, Yang SQ, Lin HZ, Trush MA, Diehl AM. Tumor necrosis factor increases mitochondrial oxidant production and induces expression of uncoupling protein-2 in the regenerating liver. **Hepatology** 29:667-677, 1999.
12. Li Y, **Zhu H**, Trush MA. Lucigenin and luminol as chemilumigenic probes for detecting reactive oxygen species production in isolated mitochondria. **Biochim Biophys Acta** 1428:1-12, 1999.
13. Li Y, Stansbury KH, **Zhu H**, Trush MA. Biochemical characterization of lucigenin (bis-N-methylacridinium) as a unique chemiluminescent probe for detecting intramitochondrial superoxide anion radical production. **Biochem Biophys Res Commun** 262:80-87, 1999.
14. Yang S, **Zhu H**, Li Y, Lin H, Gabrielson K, Trush MA, Diehl AM. Mitochondrial adaptations to obesity-related oxidant stress. **Arch Biochem Biophys** 378:259-268, 2000.
15. Chen H, Cangello D, Benson S, Folmer J, **Zhu H**, Trush MA, Zirkin BR. Age-related increase in mitochondrial superoxide generation in the testosterone-producing cells of Brown Norway rat testes: relationship to reduced steroidogenic function? **Exp Gerontol** 36:1361-1373, 2001.

16. Trush MA, **Zhu H**, Li Y. Assessing underlying mechanisms of quinoid-induced hematopoietic cell toxicity. **Ad Exp Med Biol** 500:509-512, 2001.
17. Franek WR, Morrow DMP, **Zhu H**, Vancurova I, Miskolci V, Darley-USmar K, Simms HH, Mantell LL. NF-kB protects lung epithelium against hyperoxia induced non-apoptotic cell death-Oncosis. **Free Radic Biol Med** 37:1670-1679, 2004
18. **Zhu H**, Itoh K, Yamamoto M, Zweier JL, Li Y. Role of Nrf2 signaling in regulation of antioxidants and phase 2 enzymes in cardiac fibroblasts: protection against reactive oxygen and nitrogen species-induced cytotoxicity. **FEBS Lett** 579:3029-3036, 2005
19. Li Y, Cao Z, **Zhu H**, Trush MA. Differential roles of 3H-1,2-dithiole-3-thione-induced glutathione, glutathione S-transferase and aldose reductase in protecting against 4-hydroxynonenal toxicity in cultured cardiomyocytes. **Arch Biochem Biophys** 439:80-90, 2005
20. Li Y, Cao Z, **Zhu H**. Upregulation of endogenous antioxidants and phase 2 proteins by the red wine polyphenol, resveratrol in cultured aortic smooth muscle cells leads to cytoprotection against oxidative and electrophilic stress. **Pharmacol Res** 53:6-15, 2006
21. **Zhu H**, Zhang L, Itoh K, Yamamoto M, Ross D, Trush MA, Zweier JL, Li Y. Nrf2 controls bone marrow stromal cell susceptibility to oxidative and electrophilic stress. **Free Radic Biol Med** 41:132-143, 2006.
22. Cao Z, **Zhu H** (Cao and Zhu contributed equally), Zhang L, Zhao X, Zweier JL, **Li Y**. Antioxidants and phase 2 enzymes in cardiomyocytes: chemical inducibility and chemoprotection against oxidant and simulated ischemia-reperfusion injury. **Exp Biol Med** 231:1353-1364, 2006.
23. **Zhu H**, Zhang L, Xi X, Zweier JL, Li Y. 4-Hydroxy-2-nonenal upregulates endogenous antioxidants and phase 2 enzymes in rat H9c2 myocardial cells: protection against overt oxidative and electrophilic injury. **Free Radic Res** 40:875-884, 2006.
24. Xia S, Villamena FA, Hadad CM, Kuppusamy P, Li Y, **Zhu H**, Zweier JL. Reactivity of dioxygen to ethoxycarbonyl derivatives of tetrathiatritylmethyl radicals. **J Organic Chem** 71:7268-7279, 2006.

25. **Zhu H**, Zhang L, Trush MA, Li Y. Upregulation of endogenous glutathione system by 3H-1,2-dithiole-3-thione in pancreatic RINm5F beta-cells as a novel strategy for protecting against oxidative beta-cell injury. **Free Radic Res** 41:242-250, 2007.
26. **Zhu H**, Cao Z, Zhang L, Trush MA, Li Y. Glutathione and glutathione-linked enzymes in human aortic smooth muscle cells: chemical inducibility and protection against reactive oxygen and nitrogen species-induced injury. **Mol Cell Biochem** 301:47-59, 2007.
27. Jone CI, **Zhu H**, Martin SF, Han Z, Li Y, Alevriadou BR. Regulation of antioxidants and phase 2 enzymes by shear-induced reactive oxygen species in endothelial cells. **Ann Biomed Eng** 35:683-693; 2007.
28. **Zhu H**, Jia Z, Mahaney JE, Ross D, Misra HP, Trush MA, Li Y. The highly expressed and inducible endogenous NAD(P)H:quinone oxidoreductase 1 in cardiovascular cells acts as a potential superoxide scavenger. **Cardiovasc Toxicol** 7:202-211, 2007
29. Jia Z, **Zhu H**, Trush MA, Misra HP, Li Y. Generation of superoxide from reaction of 3H-1,2-dithiole-3-thione with thiols: implications for dithiolethione chemoprotection. **Mol Cell Biochem** (in press) 2007.
30. Jia Z, Hallur S, **Zhu H**, Li Y, Misra HP. Potent upregulation of glutathione and NAD(P)H:quinone oxidoreductase 1 by alpha-lipoic acid in human neuroblastoma SH-SY5Y cells: protection against neurotoxicant-elicited cytotoxicity. **Neurochem Res** (in press) 2007.
31. Jia Z, **Zhu H**, Misra HP, Li Y. Potent induction of total cellular GSH and NQO1 as well as mitochondrial GSH by 3H-1,2-dithiole-3-thione in human neuroblastoma cells: protection against neurocytotoxicity elicited by dopamine, 6-hydroxydopamine, 4-hydroxy-2-nonenal, and hydrogen peroxide. **Brain Res** (submitted) 2007.
32. **Zhu H**, Jia Z, Zhang L, Yamamoto M, Misra HP, Trush MA, Li Y. Antioxidants and phase 2 enzymes in macrophages: regulation by Nrf2 signaling and protection against oxidative and electrophilic stress. **Exp Biol Med** (submitted) 2007.

33. Jia Z, **Zhu H**, Mahaney JE, Li Y, Misra HP. EPR studies on the superoxide-scavenging capacity of the nutraceutical resveratrol. (to be submitted) 2007.

PUBLICATIONS- INVITED BOOK CHAPTERS

1. Li, Y., **Zhu, H.**, Stansbury, K. H., and Trush, M. A. Role of reactive oxygen species in multistage carcinogenesis. In C. E. Thomas, and B. Kalyanaraman (eds.), **Oxygen Radicals and the Disease Process**, pp. 237-277, Harwood Academic Publishers, Amsterdam, 1997.

PUBLICATIONS - ABSTRACTS AND MEETING PRESENTATIONS

1. Li, Y., **Zhu, H.**, and Qiao, C. Toxic effects of chlorobutadiene inhalation on the bone marrow of mice (Abs No. 379). **The Compilation of Abstracts of the Fifth International Conference on Toxicology**, England, pp. 127, 1989.
2. Li, Y., **Zhu, H.**, and Qiao C. Toxic effects of chlorobutadiene on the immunosurveillance function of mice (Abs No. 380). **The Compilation of Abstracts of the Fifth International Conference on Toxicology**, England, pp. 127, 1989.
3. Li, Y., **Zhu, H.**, and Qiao C. Toxic effects of chlorobutadiene on the macrophages of rat and mouse (Abs No. 381). **The Compilation of Abstracts of the Fifth International Conference on Toxicology**, England, pp. 127, 1989.
4. Li, Y., **Zhu, H.**, and Qiao C. Effects of chlorobutadiene on the levels of cAMP and cGMP in plasma and splenic lymphocytes of mice (Abs No. 371). **The Compilation of Abstracts of the Fifth International Conference on Toxicology**, England, pp. 125, 1989.
5. Li, Y., **Zhu, H.**, and Qiao C. Changes of immune function of workers exposed to chlorobutadiene (Abs No. 417). **The Compilation of Abstracts of the Fifth International Conference on Toxicology**, England, pp. 139, 1989.
6. **Zhu, H.**, Li, Y., and Trush, M. A. Biochemical characterization of benzo(a)pyrene quinone-induced toxicity to primary cultured bone marrow stromal cells from DBA/2

- mice: potential role of mitochondrial dysfunction. **The Toxicologist** 14:395, 1994.
7. Li, Y., **Zhu, H.**, and Trush, M. A. 12-O-Tetradecanoyl phorbol-13-acetate (TPA)-induced differentiation of ML-1 cells to monocytes/macrophages is accompanied by increased xenobiotic detoxifying activities and decreased susceptibility to hydroquinone-induced toxicity. **The Toxicologist** 15:302-303, 1995.
 8. **Zhu, H.**, Li, Y., and Trush, M. A. Difference in xenobiotic detoxifying activities between bone marrow stromal cells from mice and rats: implications for benzene-induced hematotoxicity. **The Toxicologist** 15:302, 1995.
 9. Trush, M. A., **Zhu, H.**, and Li, Y. Compartmentalized differences in the mechanisms of activation of benzene- and benzo(a)pyrene-derived quinones by bone marrow cells. **Acta Haematol.** 98 (suppl.1):90, 1997.
 10. Li, Y., **Zhu, H.**, and Trush, M. A. Lucigenin and luminol as chemilumigenic probes for monitoring reactive oxygen species production in isolated mitochondria. **Abstract book of the fourth annual meeting of the Oxygen Society**, pp. 124, 1997, San Francisco.
 11. Li, Y., **Zhu, H.**, Kuppusamy, P., Zweier, J. L., and Trush, M. A. Validation of lucigenin as a chemilumigenic probe for detecting superoxide. **Abstract book of the fourth annual meeting of the Oxygen Society**, pp. 124, 1997, San Francisco.
 12. **Zhu, H.**, Li, Y., and Trush, M. A. Mitochondria-mediated redox cycling of benzo(a)pyrene quinones in stromal cells. **Abstract book of the fourth annual meeting of the Oxygen Society**, pp. 93, 1997, San Francisco.
 13. Li, Y., **Zhu, H.**, Kuppusamy, P., Zweier, J. L., and Trush, M. A. Can superoxide come out of the mitochondria. **Free Radic. Biol. Med.** 25(suppl. 1):25, 1998.
 14. Li, Y., Stansbury, K. H., **Zhu, H.**, and Trush, M. A. Biochemical characterization of lucigenin as a unique chemiluminescent probe for detecting intramitochondrial superoxide production. **Free Radic. Biol. Med.** 25(suppl.1):25, 1998.
 15. Li, Y., **Zhu, H.**, Kuppusamy, P., Zweier, J. L., and Trush, M. A. A role for mitochondria-derived reactive oxygen species

- in protein kinase C-mediated signal transduction. **Procced. Amer. Assoc. Cancer Res.** 41:233, 2000.
16. Trush, M. A., **Zhu, H.**, and Li, Y. Using the ML-1 cell differentiation model to investigate mechanisms of chemical toxicity to mononuclear cells. 2nd International Joint Meeting "In Vitro Models and Toxicity Mechanisms", Verona, Italy, 2001.
 17. Cao, Z, **Zhu, H**, Hardej, D, Trombetta, LD, Li, Y. Increased gene expression and levels of endogenous antioxidants and phase 2 enzymes in cardiac cells treated with 3H-1,2-dithiole-3-thione: protection against oxidant and electrophile-induced cell injury. **Toxicological Sci.** 84:372, 2005.
 18. **Zhu, H**, Cao, Z, and Li, Y. Upregulation of endogenous antioxidants and phase 2 proteins by resveratrol in cultured aortic smooth muscle cells leads to cytoprotection against oxidative and electrophilic stress. **Toxicological Sci.** 84:375, 2005.
 19. Li, Y, Cao, Z, **Zhu, H**, Hussey, E, Scaramell, H, Itoh, K, Yamamoto, M, Cerreta, JM, Trombetta, LD. Chemical induction of antioxidative and phase 2 defenses in cardiovascular tissues in vivo: involvement of Nrf2 signaling and implications for cardiovascular protection. **Toxicological Sci.** 84:374, 2005.
 20. **Zhu, H**, Zhang, L, Trush, MA, Li, Y. Differential role of Nrf2 signaling in regulating the inducibility of antioxidative/anti-inflammatory defenses by 3H-1,2-dithiole-3-thione and simvastatin in macrophages. **Toxicological Sci.** 96:438, 2007.
 21. Jia Z, **Zhu, H**, Trush MA, Misra HP, Li Y. Generation of superoxide from reaction of 3H-1,2-dithiole-3-thione with thiols: implications for dithiolethione chemoprotection. **Free Radic Biol Med** (in pres) 2007.
 22. Jia Z, Hallur S, **Zhu H**, Li Y, Misra HP. Potent upregulation of glutathione and NAD(P)H:quinone oxidoreductase 1 by alpha-lipoic acid in human neuroblastoma SH-SY5Y cells: protection against neurotoxicant-elicited cytotoxicity. **Free Radic Biol Med** (in pres) 2007.
 23. Jia Z, **Zhu H**, Mahaney JE, Li Y, Misra HP. EPR studies on the superoxide-scavenging capacity of the nutraceutical resveratrol. **Free Radic Biol Med** (in press) 2007.

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