

Introduction

Cardiovascular diseases are the leading cause of death and disability for both men and women nationwide. This is an especially large problem in West Virginia, where our death rate from cardiovascular disease is higher than that of almost any other state due to a high prevalence of cardiovascular risk factors such as smoking, obesity and diabetes. Research that deepens our understanding of normal and abnormal cardiovascular function, as well as cardiovascular growth and development, is vital for the development of more effective strategies to prevent and treat cardiovascular disease. The Center for Interdisciplinary Research in Cardiovascular Sciences (CIRCS) serves this goal through a commitment to excellence in cardiovascular research that crosses traditional discipline boundaries, and to the education of students and fellows who will become the next generation of cardiovascular scientists.

Modern scientific tools have revealed the complexity of human biology, and it is now clear that meaningful advances in biomedical research will increasingly depend on the combined talents of many investigators, as well as on new patterns of interaction among basic scientists and clinician-scientists. The cross-disciplinary nature of the CIRCS provides an environment conducive to collaborative research and teaching. Our investigators hold academic appointments in the departments of Biochemistry & Molecular Biology, Community Medicine, Medicine, Microbiology, Immunology & Cell Biology, Neurobiology & Anatomy, Pediatrics, Physiology & Pharmacology, and Psychology. The CIRCS operates in close partnership with these departments to enhance the academic and intellectual environment of the WVU Health Sciences community.



Faculty

Matthew A. Boegehold, Professor of Physiology & Pharmacology. B.S., University of Michigan (1980). Ph.D., University of Arizona (1986).

Mitchell S. Finkel, Professor of Medicine. B.S., University of Maryland (1975). M.D., University of Maryland (1979).

Jefferson C. Frisbee, Assistant Professor of Physiology & Pharmacology. B.S., University of Guelph (Canada) (1991). M.S., University of Guelph (1993). Ph.D., University of Guelph (1996).

Paul M. Gordon, Associate Professor of Exercise Physiology. B.A., University of Pittsburgh (1983). M.S., University of Pittsburgh (1987). MPH, University of Pittsburgh (1991). Ph.D., University of Pittsburgh, PA (1992).

Leah W. Hammer, Research Assistant Professor of Physiology & Pharmacology. B.Sc., Monash University (Australia) (1990). Ph.D., Monash University (1994).

Pingnian He, Associate Professor of Physiology & Pharmacology. M.D., Tianjin Medical School (China) (1982). Ph.D., University of California, Davis (1990).

Robert D. Hoeldtke, Professor of Medicine. B.A., Amherst College (1962). M.D., Cornell University (1966). Ph.D., Massachusetts Institute Technology (1972).

Bing-Hua Jiang, Assistant Professor of Microbiology, Immunology & Cell Biology. B.S., South China University of Tropical Crops (1984). Ph.D., Mississippi State University (1994).

Hong Kan, Research Assistant Professor, Department of Medicine, Section of Cardiology. M.D., Tongji Medical University (China) (1981). Ph.D., University of Tennessee (1996).

Kevin T. Larkin, Professor of Psychology. B.A., Wittenberg University (1979). M.S., University of Richmond (1981). Ph.D., University of Pittsburgh (1986).

Jun Liu, Assistant Professor of Physiology & Pharmacology. M.D., China Medical University (1983). Ph.D., Oxford University (1996).

Fred L. Minnear, Professor of Physiology & Pharmacology, Assistant Dean for Graduate Studies. B.A., Oberlin College (1970). Ph.D., Oregon Health Sciences University (1979).

William A. Neal, Professor of Pediatrics. B.S., Xavier University (1962). M.D., West Virginia University (1966).

Timothy R. Nurkiewicz, Research Assistant Professor of Physiology & Pharmacology. B.S., Penn State University (1990). M.S., West Virginia University (1992). Ph.D., West Virginia University (1999).

Frank D. Reilly, Professor of Neurobiology and Anatomy. B.S., Ohio State University (1971). Ph.D., University of Cincinnati (1975).

Lisa M. Salati, Professor of Biochemistry and Molecular Pharmacology. B.S., University of Delaware (1978). M.S., University of Minnesota (1982). Ph.D., University of Minnesota (1986).

Postdoctoral Fellows

Kai Fang, Ph.D.

Wioletta Szeszel-Fedorowicz, Ph.D.

Wei Fu, Ph.D.

Zhu, Longkun, Ph.D.

Administrative Support Staff

Vickie White, Center Administrative Assistant

Technical Support Staff

Kevin Engels, Research Assistant III

Chris Waters, Research Assistant II

Kimberly Wix, Research Assistant II

Carroll McBride, Research Assistant I

Internal Advisory Board

John B. Barnett, Ph.D., Professor and Chair, Department of Microbiology, Immunology & Cell Biology

Diana S. Beattie, Ph.D., Professor and Chair, Department of Biochemistry and Molecular Pharmacology

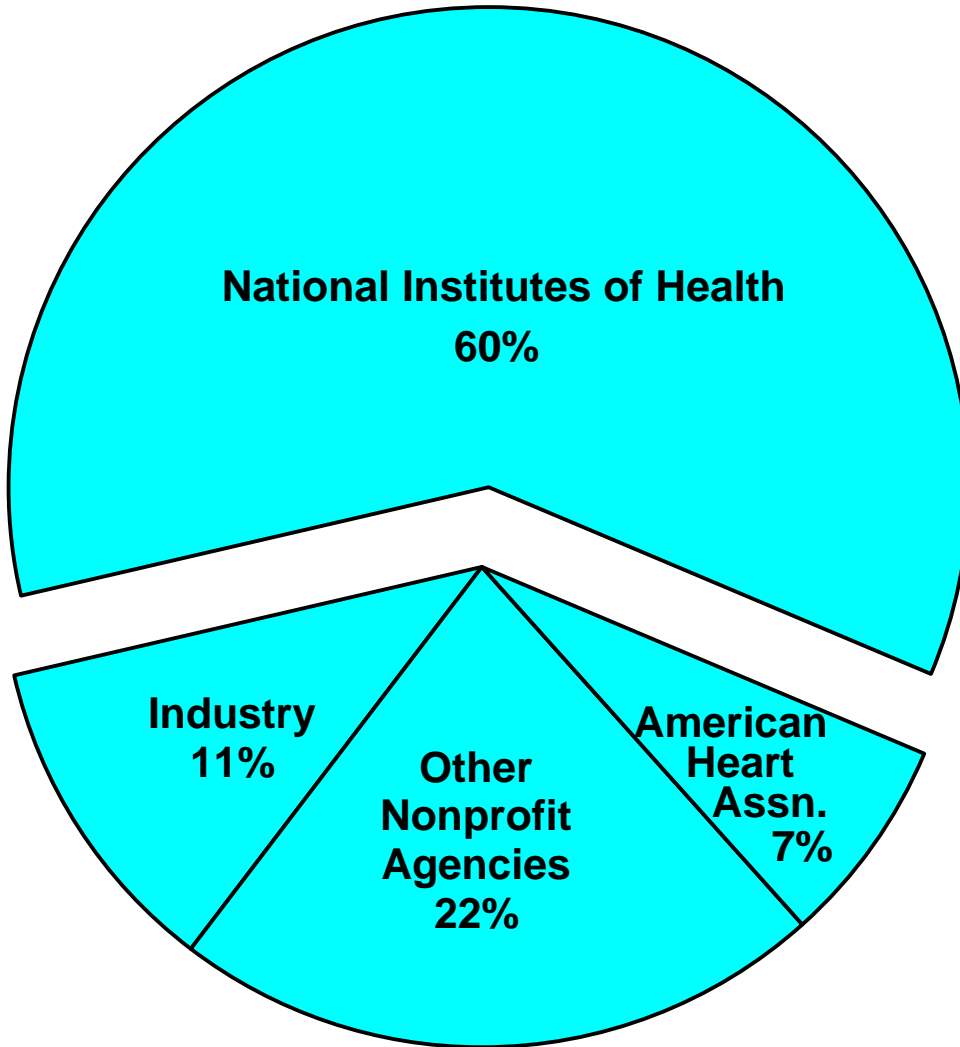
Richard D. Dey, Ph.D., Professor and Chair, Department of Neurobiology and Anatomy

Robert L. Goodman, Ph.D., E.J. Van Liere Professor and Chair, Department of Physiology and Pharmacology

Thomas Saba, Ph.D., Associate Vice President for Research & Graduate Education, Health Sciences, and Associate Dean, School of Medicine

Research: Extramural Funding Profile, 2003-2004

CIRCS Sources of Extramural Funding
Total Direct Costs for 2003-2004: \$ 3,305,716



Principal Investigator Grants and Fellowships held by Center Faculty, 2003-2004

American Heart Association

“Caveolae, Caveolin, and Angiogenesis”, Jun Liu, M.D., Ph.D.

"Functional Changes in the Microvascular Endothelium during Juvenile Growth", Matthew A. Boegehold, Ph.D.

“Mechanisms of Impaired Skeletal Muscle Arteriolar Dilation to Reduced PO₂ in Obese Zucker Rats”, Jefferson C. Frisbee, Ph.D.

“Role of PI 3-kinase in VEGF- and Angiopoietin-1-induced Angiogenesis”, Bing-Hua Jiang, Ph.D.

“Identification of Splicing Regulatory Proteins Involved in the Inhibition of RNA Processing by Polyunsaturated Fat”, Predoctoral Fellowship, Sponsor: Lisa M. Salati, Ph.D.

National Institutes of Health

“Adherens Junction Integrity and Barrier Function” Fred L. Minnear, Ph.D.

“Age, Gender and Skeletal Muscle Microcirculation”, Leah W. Hammer, Ph.D.

“Cardiac Myocytes in HIV Transgenic Mouse” Mitchell S. Finkel, M.D.

"Cellular Modulation of Microvessel Permeability *in vivo*". Pingnian He, M.D., Ph.D.

“Dietary Salt and the Microvascular Endothelium”, Matthew A. Boegehold, Ph.D.

“Endothelial Transduction of Shear Stress”, Timothy R. Nurkiewicz, Ph.D.

“Functional SNP’s Associated with Human Muscle Size & Strength”, (Site PI) Paul M. Gordon, Ph.D., MPH

“Mechanism of PI 3-kinase-Induced Angiogenesis *in vivo*”, Bing-Hua Jiang, Ph.D.


“Skeletal Muscle Microcirculation in the Obese Zucker Rat”, Jefferson C. Frisbee, Ph.D.

“Regulation of Gene Expression by Dietary Fat”, Lisa M Salati, Ph.D.

“Regulation of Cardiac Myocytes by HIV gp120”, Mitchell S. Finkel, M.D.

WV Bureau of Public Health/Centers for Disease Control

Environmental Influences on Physical Activity Levels among West Virginians. Paul M. Gordon, Ph.D., MPH



Other Nonprofit Agencies

American Cancer Society: “Role of PI3K Signaling in Ovarian Tumorigenesis”, Bing-Hua Jiang, Ph.D.

Claude Worthington Benedum Foundation: “CARDIAC Project”, William A. Neal, M.D.

Juvenile Diabetes Foundation: “Effect of GAD65Ab on β -cell and Peripheral Nerve Function in IDDM”, Robert D. Hoeldtke, M.D., Ph.D.

West Virginia Department of Health and Human Resources: “CARDIAC Project”, William A. Neal, M.D.


Industry

Eli Lilly: “Treatment of Diabetic Peripheral Neuropathy with a Protein Kinase C Inhibitory”, Robert D. Hoeldtke, M.D., Ph.D.

Shire Pharmaceuticals: “Treatment of Orthostatic Hypotension with Proamatine” Robert D. Hoeldtke, M.D., Ph.D.

Publications by Center Faculty, 2003-2004

Journal Articles

Boden G, Hoeldtke RD. Nerves, fat, and insulin resistance. *New England Journal of Medicine* 349:1966-1967, 2003.

Boury J, Larkin KT, Krummel DA. Factors related to postpartum depressive symptoms in low-income women. *Women & Health* 39:19-34, 2004.

Czarby M, Liu J, Oh P, Schnitzer JE. Transient mechano-activation of neutral sphingomyelinase in caveolae to generate ceramide. *Journal of Biological Chemistry* 278: 4424-4430, 2003.

Demerath E, Muratova V, Spangler E, Li J, Minor VE, Neal WA. School-based obesity screening in rural Appalachia. *Preventative Medicine* 37: 553-60, 2003.

Drenjancevic-Peric I, Frisbee JC, Lombard JH. Arteriolar responses to elevated PO₂ and vasodilator stimuli in SS.BN13 consomic rats and Dahl S hypertensive rats. *Hypertension* 41: 1012-1015, 2003.

Frisbee JC. Remodeling of the skeletal muscle microcirculation increases resistance to perfusion in obese Zucker rats. *American Journal of Physiology* 285: H104-H111, 2003.

Frisbee JC. Impaired perfusion of skeletal muscle of obese Zucker rats. *American Journal of Physiology* 285: R1124-R1134, 2003.

Frisbee JC. Enhanced arteriolar α -adrenergic sensitivity impairs dilator responses and skeletal muscle perfusion in obese Zucker rats. *Journal of Applied Physiology* 97: 764-772, 2004.

Gao N, Zhang Z, Jiang BH, Shi X. Role of PI3K/AKT/mTOR signaling in the cell cycle progression of human prostate cancer. *Biochemical and Biophysical Research Communications* 310: 1124-1132, 2003.

Gao N, Flynn DC, Zhang Z, Zhong XS, Walker V, Liu KJ, Shi X, Jiang BH. The G1 cell cycle progression and the expression of G1 cyclins are regulated by PI3K/AKT/mTOR/p70S6K1 signaling in human ovarian cancer cells. *American Journal of Physiology* 287: C281-91, 2004.

Gao N, Shen L, Zhang Z, Leonard SS, He H, Zhang X-G, Shi X, Jiang BH. Arsenite induces HIF-1 α and VEGF through PI3K, Akt and reactive oxygen species in DU145 human prostate carcinoma cells. *Molecular and Cellular Biochemistry* 255:33-45, 2004.

Gordon, P., S. Zizzi, D. Goodrich. Use of a Community Trail Among New and Habitual Exercisers: A preliminary assessment. *Preventing Chronic Disease* (serial online) 2004 Oct. URL: http://www.cdc.gov/pcd/issues/2004/oct/04_0058.htm.

Hammer LW, Overstreet CR, Choi J, Hester RL. ATP stimulates the release of prostacyclin from perfused veins isolated from the hamster hindlimb. *American Journal of Physiology* 285: R193-R199, 2003.

Hoeldtke RD. Nitrosative stress in early Type 1 diabetes. *Clinical Autonomic Research* 13: 406-421, 2003.

Hoeldtke RD, Bryner KD, McNeill DR, Hobbs GR, Baylis C. Peroxynitrite versus nitric oxide in early diabetes. *American Journal of Hypertension* 16: 761-766, 2003.

Hoeldtke RD, Bryner KD, McNeill DR, Warehime SS, VanDyke K, Hobbs G. Oxidative stress and insulin requirements in patients with recent-onset type 1 diabetes. *Journal of Clinical Endocrinology and Metabolism* 88: 1624-1628, 2003.

Iyer S, Ferreri DM, DeCocco NC, Minnear FL, Vincent PA. VE-Cadherin-p120 interaction is required for maintenance of endothelial barrier function. *American Journal of Physiology*. In Press, 2004.

Kan H, Finkel MS. Inflammatory mediators and reversible myocardial dysfunction. *Journal of Cellular Physiology* 195:1-11, 2003.

Kan H, Xie Z, Finkel MS. P38 MAP Kinase Mediated Negative Inotropic Effect of HIV gp120 on Cardiac Myocytes. *American Journal of Physiology* 286: C1-7, 2004.

Kelley C, Krummel D, Gonzales EN, Neal WA, Fitch CW. Dietary intake of children at high risk for cardiovascular disease. *Journal of the American Dietetic Association* 104:222-5, 2004.

Krummel DA, Semmens E, Boury J, Gordon PM, Larkin KT. Stages of change for weight management in postpartum women. *Journal of the American Dietetic Association* 104: 1102-1108, 2004.

Larkin KT, Zayfert C. Anger expression and essential hypertension: Behavioral response to confrontation. *Journal of Psychosomatic Research*. 56: 113-118, 2004.

Leonard SS, Xia C, Jiang BH, Stinefelt B, Klandorf H, Harris GK, Castranova V, Shi X. Resveratrol scavenges reactive oxygen species and protects against radical-induced cellular responses. *Biochemical and Biophysical Research Communications* 309:1017-26, 2003.

Li J, Davidson G, Huang Y, Jiang BH, Shi X, Costa M, Huang C. Nickel compounds act through PI3K/Akt-dependent, p70S6K-independent pathway to induce HIF transactivation and Cap43 expression in mouse epidermal C141 cells. *Cancer Research* 64: 94-101, 2004.

Lombard JH, Sylvester FA, Phillips SA, Frisbee JC. High salt diet impairs dilator responses of rat middle cerebral arteries to hypoxia and prostacyclin. *American Journal of Physiology* 284: H1124-1133, 2003.

Murrant CL, Frisbee JC, Woodley WE, Barclay JK. Adenosine-induced fatigue in canine skeletal muscle *in situ*. *Canadian Journal of Physiology and Pharmacology*. In Press, 2004.

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Nurkiewicz TR, Porter DW, Barger M, Castranova V, Boegehold MA. Particulate Matter Exposure Impairs Systemic Microvascular Endothelium-Dependent Dilation. *Environmental Health Perspectives* 112: 1299-1306, 2004.

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Perna, F. M., Antoni, M.H., Baum, A., Gordon, P. & Schneiderman, N. Cognitive Behavioral Stress Management Effects on Injury and Illness Among Competitive Athletes: A Randomized Clinical Trial. *Annals of Behavioral Medicine*. 2003, 25(1):66-73.

Phillips SA, Drenjancevic-Peric I, Frisbee JC, Lombard JH. AT₁ receptor blockade alters mechanisms of hypoxia-induced dilation of skeletal muscle resistance arteries. *American Journal of Physiology* 287: H545-H552, 2004.

Serebruany VL, Glassman AH, Malinin AI, Sane DC, Finkel MS, Krishnan RR, Atar D, Lekht V, O'Connor CM. Enhanced platelet/endothelial activation in depressed patients with acute coronary syndromes: evidence from recent clinical trials. *Blood Coagulation and Fibrinolysis* 14: 563-567, 2003.

Serebruany VL, Glassman AH, Malinin AI, Nemeroff CB, Musselman DL, vanZyl LT, Finkel MS, Krishnan KR, Gaffney M, Harrison W, Califf RM, O'Connor CM. Sertraline AntiDepressant Heart Attack Randomized Trial Study Group. Platelet/endothelial biomarkers in depressed patients treated with the selective serotonin reuptake inhibitor sertraline after acute coronary events: the Sertraline AntiDepressant Heart Attack Randomized Trial (SADHART) Platelet Substudy. *Circulation* 108: 939-944, 2003.

Skinner HD, Zhong X, Gao N, Shi X, Jiang BH. Arsenite induces p70S6K1 activation and HIF-1 α expression in prostate cancer cells. *Molecular and Cellular Biochemistry* 255:19-23, 2004.

Spangler, E., D. A. Krummel, N. Morrison, and P. M. Gordon. Environmental Perceptions Related to Physical Activity in High and Low Risk Counties, *J of Health Prom. Prac.* In Press, 2004.

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Suchday S, Carter MM, Ewart CK, Larkin KT, Desiderato O. Anger cognitions and cardiovascular recovery following provocation. *Journal of Behavioral Medicine,* In Press, 2004.

Thompson, PT, G. Tsongalis, PhD, C Meckes, M Miles, R Zoeller, P Visich, P Gordon, T Angelopoulos, L Pescatello, L Bausserman, M Gaughan, R Seip, N Moyna. Apolipoprotein E Genotype and Changes in Serum Lipids and Maximal Oxygen Uptake with Exercise Training. *Metabolism.* 53 (2): 193-202, 2004.

Thompson, P.D., Moyna, N., Seip, R., Price, T., Clarkson, P., Angelopoulos, T., Gordon, P., Pescatello, L., Visich, P., Zoeller, R., Devaney, J., Gordoish, H., Fieneigle, P., Hoffman, E. The FAMuSS Study (Functional Single Nucleotide Polymorphisms Associated with Human Muscle Size and Strength). *Med. Sci Sport Exerc.* 36(7) 1132-1139, 2004.

Wang S, Chen F, Zhang Z, Jiang BH, Luo J, Shi XNF-kB prevents cells from undergoing Cr(VI)-induced apoptosis. *Molecular and Cellular Biochemistry.* In Press, 2004.

Zhang Z., Gao N, He H, Huang C, Jiang BH, Luo J, Shi X. The Role of phosphatidylinositol-3 kinase and its downstream proteins in vanadate-induced cell cycle arrest at S phase. *Molecular and Cellular Biochemistry.* In Press, 2004.

Zhu L, Schwegler-Berry D, Castranova V, He P. Internalization of caveolin-1 scaffolding domain facilitated by Antennapedia homeodomain attenuates PAF-induced increase in microvessel permeability. *American Journal of Physiology* 286: H195-H201, 2004.

Zhu X, Hall D, Ridenour G, Boo S, Jennings T, Hochberg J, Cilento E, Reilly FD. A mouse model for studying rapid intraoperative methods of skin closure and wound healing. *Medical Science Monitor* 9: BR109-15, 2003.

Book Chapters and Invited Reviews

Finkel MS, Mirza H. Pharmacologic management of chronic heart failure. In: *Modern Pharmacology with Clinical Correlations* 6th Edition, Lippincott Williams and Wilkins Chapter 15, pp 151-159, 2004.

Gordon, P. Hyperlipidemia: In: *Textbook of Clinical Exercise Physiology, Human Kinetics*, Champaign, IN, May 2003.

Kan H, Finkel MS. Inflammatory mediators and reversible myocardial dysfunction. *Journal of Cellular Physiology* 195: 1- 11, 2003.

Lombard JH, Frisbee JC, Roman RJ, Falck JR. Evaluation of cytochrome P450-4A w-hydroxylase as an oxygen sensing mechanism in the microcirculation. In: *Oxygen Sensing – Methods in Enzymology*. Volume 381. C.K. Sen and G.L. Semenza (Eds.). New York: Academic Press Inc. p. 140-165, 2004.

Minnear FL. Platelet phospholipids tighten the endothelial barrier. In: *Encyclopedia Microvasculature* 2004.

Abstracts

Dunbar, C., D. Krummel, P. Gordon. Physical activity assessment of postpartum women using a 7 day physical activity log and pedometer. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2003.

Frisbee JC. Impaired performance and active hyperemia of *in situ* skeletal muscle in obese Zucker rats. *FASEB Journal* 17: A33, 2003.

Frisbee JC. Heterogeneous reactivity of third order arterioles of *in situ* rat cremaster muscle. *FASEB Journal* 17: A65, 2003.

Frisbee JC. Microvascular network and arteriolar remodeling contribute to elevated skeletal muscle blood flow resistance in obese Zucker rats. *FASEB Journal* 17: A551, 2003.

Frisbee JC. Enhanced vascular α -adrenergic sensitivity impairs arteriolar dilator responses and resting blood flow in skeletal muscle of obese Zucker rats. *Hypertension* 42: 436, 2003.

Frisbee JC. Oxidant stress-based reduction in nitric oxide bioavailability contributes to skeletal muscle microvascular rarefaction in obese Zucker rats. *FASEB Journal* 18: A653, 2004.

Frisbee JC. Hypertension-independent skeletal muscle microvascular rarefaction in the metabolic Syndrome X. *FASEB Journal* 18: A273, 2004.

Frisbee JC. Chronic elevations in oxidant stress impair skeletal muscle perfusion with high metabolic demand in obese Zucker rats with high metabolic demand. *FASEB Journal* 18: A628, 2004.

Frisbee JC, Maas CM, Kelm MA. Pulmonary hypertension in the metabolic Syndrome X. *FASEB Journal* 18: A1054, 2004.

Frisbee JC, Kelm MA, Maas CM, Kaul S. Reduced microvascular surface area contributes to pulmonary hypertension in obese Zucker rats. *FASEB Journal* 18: A1054, 2004.

Griffith BN, Salati LM. Glucose stimulation of glucose-6-phosphate dehydrogenase expression in HepG2 cells involves changes in pre-mRNA processing efficiency. *Rustbelt RNA Society Annual Meeting*, 2003.

Griffith BN, Salati LM. Identification of RNA binding protein(s) responsible for the posttranscriptional regulation of glucose-6-phosphate dehydrogenase. *RNA Society Annual Meeting*, 2004.

Hammer LW, Overstreet CR, Hester RL. Arachidonic acid metabolites regulate functional hyperemia. *FASEB Journal* 17(5): A838, 2003.

Hammer LW, Boegehold MA. Functional hyperemia is impaired in 12 month old male rats. *FASEB Journal* 18(3): A655, 2004.

Harmon, B., J. Devaney, E. Hoffman, P. Gordon, et al. Association Between Polymorphic Variation in the CARP Gene and Muscle Size and Strength. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2003.

Jiang BH. PI3K signaling in cell cycle progression, tumor formation and angiogenesis. *Gordon Research Conference: Mechanisms of Cell Signaling*, 2003.

Jiang BH, Gao N, Flynn DC, Shi X. Role of PI3K/AKT/mTOR Signaling in G₁ Cell Cycle Progression in Human Ovarian Cancer Cells. *American Association for Cancer Research, Annual Meeting*, 2003.

Kan H, Xie S, Finkel MS. Negative inotropic effect of troponin I phosphorylation by P 38 MAP kinase. *Journal of the American College of Cardiology* 41(6): 156A, 2003.

Kan H, Birkle D, Xie S, Failing C, Jain AC, Finkel MS. Myocardial dysfunction in prenatally stressed rats. *FASEB Journal* 17(4): A229, 2003.

Kelsey, B., T. Price, N. Moyna, L. Pescatello, P. Clarkson, R Seip, P Visich, P Gordon, T Angelopolous, P. Thompson, E. Hoffman. Changes in Muscle Size & Strength are Similar in Lean and Obese Women after Resistance Training. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2003.

Kelsey, B., Price, T., Moyna, N., Pescatello, L., Clarkson, P., Seip, R., Visich, P., Zoeller, R., Gordon, P., Angelopolous, T., Thompson, P., Hoffman, E. Changes in Muscle Size and Strength are Similar in Lean and Obese Women After Resistance Training. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2004.

Krummel D., P. Gordon, K. Larkin. The Mothers' Overweight Management Study: Obesity Prevention in the Postpartum Period. *Annals of Behavioral Medicine*. 2003;24:S054.

Kyriazis G, JD Caplan, J Lowndes, RF Zoeller, M Miles, NM Moyna, P Visich, P Gordon, L Pescatello, R Seip, PD Thompson, TJ Angelopoulos. BMI the leptin response to exercise training. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2003.

Larkin KT, Waller S, Combs-Lane A. Anxiety management group therapy for multiple anxiety disorder diagnoses. *Association for Anxiety Disorders of America, Annual Meeting*, 2003.

Larkin KT, Taylor BK, Hernandez DH, Goodie JL, Doyle A, O'Quinn SR, Mihelic AM, Elnicki, DM. Daily stress and coping in essential hypertension. *American Psychosomatic Society, Annual Meeting*, 2004.

Larkin KT, Williams K, Bishop H, Morise A, Johnson A, Taylor B, Ravi N, Kolar M. Cardiovascular and neuroendocrine reactions to mental stress and myocardial blood flow among cardiac patients undergoing positron emission tomography. *American Psychosomatic Society, Annual Meeting*, 2004.

Liparulo, T.L, A.L. Sindler, and P.M. Gordon. Impact of residential location on frequency of community trail use for physical activity. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2003.

Lowndes, J., Seip, R., Moyna, N., Zoeller, R., Gordon, P., Pescatello, L., Visich, P., Miles, M., Thompson, P.D. The effects of Apolipoprotein E Genotype and Gender on C-Reactive Protein (CRP) at Baseline and After Six Months of Exercise. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2004.

Marvar PJ, Boegehold MA. Reduced arteriolar responses to muscle contraction in rats fed high salt are not due to altered nitric oxide (NO) activity. *FASEB Journal* 17(4): A543, 2003.

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Minnear FL, He P, Morton CA, Zhu L, Moy AB, Vincent PA. Sphingosine 1-phosphate tightens the endothelial barrier in vitro and in vivo in association with increases in intracellular calcium, myosin light chain phosphorylation, and cellular tension. *FASEB Journal* 18: A245, 2004.

Nurkiewicz TR, Boegehold MA. Absence of calcium-independent release of endothelial nitric oxide in young rats. *FASEB Journal* 17(5): A838, 2003.

Nurkiewicz TR, Porter DW, Barger M, Castranova V, Boegehold MA. Impaired endothelium-dependent dilation after pulmonary residual oil fly ash (ROFA) exposure in the systemic microcirculation. *FASEB Journal* 18(3): A655, 2004.

Reilly F, Kamsala M, Reed A, Altemus J. Interactive head & neck radiology courseware for the Internet. *Slice-of-Life Conference*, 2003.

Reilly F, Allen E, Altemus J, Reed A, Gaskins L, Saunders S, Aukerman J. Interactive peripheral nervous system WebCT site. *FASEB Journal*, 17(4): A387, 2003.

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Szeszel-Fedorowicz W, Tao H, Gibson MA, Amir-Ahmady B, Salati LM. Inhibition of Splicing of the Glucose-6-Phosphate Dehydrogenase (G6PD) Pre-mRNA by Polyunsaturated Fat. *Rustbelt RNA Society Annual Meeting*, 2003.

Szeszel-Fedorowicz W, Tao H, Gibson MA, Salati LM. Inhibition of glucose-6-phosphate dehydrogenase (G6PD) pre-mRNA processing by polyunsaturated fatty acids. *FASEB Summer Conference*, 2003.

Seip, R., C. Bilbie, N. Moyna, M. Miles, R. Zoeller, P. Visich, T. Angelopolous, L. Pescatello, P. Gordon, G. Tsongalis, L. Bausserman, P. Thompson. Effect of Apo E, Gender and Exercise on Lipase Activities. *J. Am. College Card.* 2004.

Seip R, RF Zoeller, M Miles, NM Moyna, P Visich, P Gordon, L Pescatello, TJ Angelopoulos, PD Thompson. Exercise fails to improve the LDLC / HDLC ratio in subjects with apolipoprotein E4 genotype. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2003.

Sindler, A., D. Krummel, and P. Gordon. Use of the CAPS-TWPAS survey in post-partum, low income women in West Virginia. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2003.

Talukdar I, Szeszel-Fedorowicz W, Salati LM. Regulation of Glucose-6-Phosphate Dehydrogenase (G6PD) by Insulin and Polyunsaturated Fatty Acids in Rat Hepatocytes. *FASEB Summer Conference*, 2003.

Talukdar I, Szeszel-Fedorowicz W, Tao H, Gibson MA, Salati LM. RNA Regulation of glucose-6-phosphate dehydrogenase pre-mRNA splicing-localization of the regulatory element. *RNA Society Annual Meeting*, 2004.

Visich, P., B., Thompson, P. Gordon and the Exercise and Genetics Research Group. Gender Differences in Strength Gains Following a Resistance Training Program in the Upper Arm. *Medicine and Science and Sports and Exercise*. 34(5) Supp, 2003.

Zhu L, Castranova V, He P. The release of reactive oxidant species (ROS) by FMLP-stimulated leukocytes increases microvessel permeability. *FASEB Journal* 17: A134, 2003.

Zhu L, He P. *In vivo* delivery of caveolin-1 scaffolding domain attenuates PAF-induced increase in microvessel permeability. *FASEB Journal* 17: A131, 2003.

Zhu L, He P. Platelet activating factor (PAF) increases endothelial $[Ca^{2+}]_i$ and nitric oxide (NO) production in individually perfused intact microvessels. *FASEB Journal* 18: A245, 2004.

Zhu L, Castranova V, He P. Reactive oxidant species (ROS) release from fMLP-stimulated neutrophils increases microvessel permeability via nitric oxide (NO)-cGMP-dependent pathway. *FASEB Jr* 18: A245, 2004.

National and International Honors and Recognition of Center Faculty, 2003-2004

Matthew A. Boegehold, Ph.D.

Editorial Board, *Microcirculation*

Research Committee, American Heart Association, Ohio Valley Affiliate

Executive Council, Microcirculatory Society

Symposium organizer and chairman, "Evolution of Vascular Regulation from the Neonate to the Aging Adult: Mechanisms and Functional Consequences", Experimental Biology 2003.

Planning Committee, conference of the Microcirculatory Society and British Microcirculatory Society

Mitchell S. Finkel, M.D.

Editorial Board, *Journal of the American College Cardiology*

Medical Staff Fellowship, National Heart, Lung and Blood Institute

Special Emphasis Panel on Highly Active Antiretroviral Therapy Cardiovascular Toxicities, National Heart, Lung and Blood Institute

Jefferson C. Frisbee, Ph.D.

Associate Editor/Editorial Board, *Microcirculation*

Executive Organizing Committee, and Liaison, Education, Scientific Programming Committees for the World Congress for Microcirculation

Symposium co-chairman, "Young Investigator Symposium", Experimental Biology 2003 and 2004

Paul M. Gordon, Ph.D., MPH

Editorial Reviewer, *Medicine and Science in Sports and Exercise*

Editorial Reviewer, *Journal of Clinical Exercise Physiology*

Editorial Reviewer, *British Journal of Sports Medicine*

Editorial Reviewer, *Research Quarterly*

Certified Exercise Specialist for Preventive and Rehabilitative Exercise Programs, American College of Sports Medicine

Pingnian He, M.D., Ph.D.

Editorial Board, *Microcirculation*

Research Committee, American Heart Association, Ohio Valley Affiliate

Ad Hoc reviewer, Cardiovascular and Renal study section, National Heart, Lung and Blood Institute.

Bing-Hua Jiang, Ph.D.

Editorial Reviewer, *Proceedings of the National Academy of Science, USA*

Editorial Reviewer, *Molecular Cancer Therapeutics*

Jun Liu, M.D., Ph.D.

Scientist Development Award, American Heart Association

Fred L. Minnear, Ph.D.

Editorial Board, *American Journal of Physiology: Lung Cell and Molecular Physiology*

William A. Neal, M.D.

The Governors' Distinguished West Virginian Award, 2003.

Louis Gorin Award for Outstanding Achievement in Rural Health, National Rural Health Assn., 2003

Caperton Award for Outstanding Rural Health Community Project, 2003.

GlaxoSmithKline Partnership or Healthy Children Award, American Public Health Association, 2003

The Ethel & Gerry Heebink Award for Distinguished State Service, 2004.

Frank D. Reilly, Ph.D.

Member, Working Group on Cardiovascular System, International Virtual Medical School, 2003-2004

Member, Working Group on Neurobiology and Stroke, International Virtual Medical School, 2003-2004

Lisa M. Salati, Ph.D.

Dean's award for Excellence in Research, West Virginia University School of Medicine, 2003

Member, Integrated Nutrition and Metabolic Processes Study Section, National Institutes of Health

Invited Presentations and Lectures by Center Faculty, 2003-2004

Matthew A. Boegehold, Ph.D.

“Reduced Microvascular Nitric Oxide after High Salt Intake: A Role for Reactive Oxygen Species”. Department of Cell Biology and Physiology, University of New Mexico School of Medicine.

“Suppression of Microvascular Nitric Oxide Activity by Dietary Salt: A Role for Reactive Oxygen Species?”. Department of Cellular and Integrative Physiology, Indiana University School of Medicine.

“Sympathetic Control of Arteriolar Tone: Modulation by Nitric Oxide and Local Metabolic Factors”. Department of Bioengineering, University of California, San Diego.

Mitchell S. Finkel, M.D.

“Treating Depression in the Cardiovascular Patient”. Princeton Community Hospital, Bluefield, VA.

“Heart Disease and Depression”. Mount Vernon Hospital, Mount Vernon, New York.

“Heart Disease and Depression”. Bronx VA Medical Center, Bronx, New York.

“Managing Depressed Patients with Heart Disease”. Roanoke Memorial Hospital. Roanoke, VA.

“Preventive Cardiology”. Louis A. Johnson VA Medical Center. Clarksburg, WV.

“New Advances in the Understanding of Cardiovascular Disease and Depression”. Prime Medical Conference, Long Beach, CA.

“New Advances in the Treatment of Mood and Anxiety Disorders”. Birmingham, MI

“New Advances in the Treatment of Mood and Anxiety Disorders”. Burlington, MA.

“New Advances in the Treatment of Mood and Anxiety Disorders”. Boston, MA.

“New Advances in the Treatment of Mood and Anxiety Disorders”. University of Cincinnati.

“New Advances in the Treatment of Mood and Anxiety Disorders”. Minneapolis, MN.

“New Advances in the Treatment of Mood and Anxiety Disorders”. Denver, CO.

“New Advances in the Understanding of Cardiovascular Disease and Depression”. Prime Medical Conference, Rosemont, IL.

“New ACC/AHA Guidelines for the Management of Congestive Heart Failure”. Glade Springs Resort, Daniels, WV.

“New ACC/AHA Guidelines for the Management of Congestive Heart Failure”. Stonewall Resort, WV.

“New ACC/AHA Guidelines for the Management of Congestive Heart Failure”. Logan General Hospital, WV.

“New ACC/AHA Guidelines for the Management of Congestive Heart Failure”. Charleston, WV.

Jefferson C. Frisbee, Ph.D.

“Impaired Performance and Active Hyperemia of *In Situ* Skeletal Muscle of Obese Zucker Rats”.
Experimental Biology 2003, San Diego, CA.

“The Obese Zucker Rat Model of ‘Syndrome X’: Alterations in Skeletal Muscle Microcirculatory Structure and Function”. University of Minnesota-Duluth School of Medicine.

“Pulmonary Hypertension in the Metabolic Syndrome X”. Veterans Affairs Medical Center, Milwaukee, WI.

“Peripheral Ischemia in the Obese Zucker Rat: Lessons from ‘Hemo the Magnificent’ and Marshall McLuhan”.
Medical College of Wisconsin.

“Peripheral Ischemia in the Obese Zucker Rat: Lessons from ‘Hemo the Magnificent’ and Marshall McLuhan”.
Texas A&M University.

“Hypertension-Independent Microvascular Rarefaction in Skeletal Muscle of Obese Zucker Rats”. Experimental
Biology 2004, Washington, D.C.

“Superoxide Scavengers Improve Impaired Dilator Reactivity of Cerebral Resistance Arteries of Obese Zucker
rats” (with S.A. Phillips). Experimental Biology 2004, Washington, D.C.

Paul M. Gordon, Ph.D., MPH

“Exercise and Health: Use it or Lose it”. 2004 Snowshoe Institute

“Exercise Physiology as a Profession” Trinity Christian High School, Morgantown, WV

Bing-Hua Jiang, Ph.D.

"PI3K Signaling in Angiogenesis, Proliferation, and Differentiation". Department of Anatomy, Case Western
Reserve University.

Kevin T. Larkin, Ph.D.

“Coping with Stress” Doctors on Call, West Virginia Public Television, 2003

Lisa M. Salati, Ph.D.

“Inhibition of RNA Processing by Polyunsaturated Fat”, University of Kentucky

“Nutritional Regulation of mRNA Processing”, Harvard University

“Inhibition of Glucose-6-Phosphate Dehydrogenase Pre-mRNA Processing by Polyunsaturated Fatty Acids”,
FASEB Summer Research Conference, Snowmass, CO

Investments in Collaborative Research 2003-2004

Over the past year, Center funds have been used in the following ways to promote and enhance collaborative research among Center faculty:

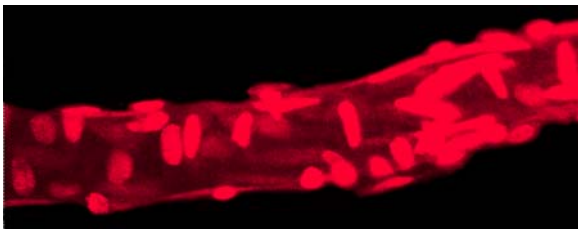
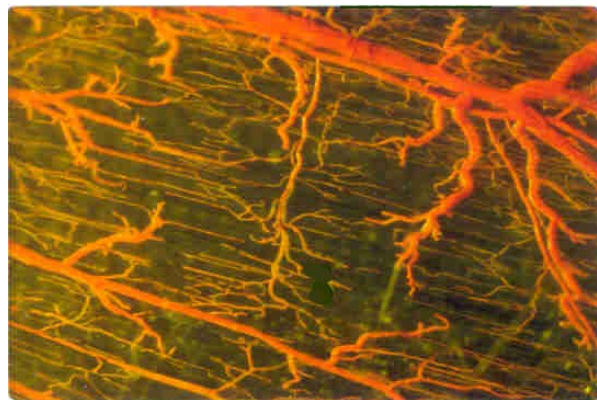
\$9,994 toward the purchase of a new fluorescence confocal laser scanning microscopy system, and \$13,110 to purchase an extended maintenance agreement for this system. This system can accommodate single microvessel perfusion and live tissue perfusion experiments, and its installation was completed in June, 2004. To date, at least four different Center laboratories have used this system to acquire high resolution images for such tasks as determining the spatial distribution of adhesion molecules and measuring oxygen radical formation in intact microvessel walls, visualizing calcium dynamics in contracting myocardial cells, and localizing the expression of proteins that regulate endothelial cell permeability. This core facility is located adjacent to the laboratory of Dr. Pingnian He

\$14,885 to purchase a high performance data acquisition system for the dynamic measurement of cardiovascular variables in animals and humans. This system, which will enhance the research capabilities of numerous Center faculty, is located in the laboratory of Dr. Mitchell Finkel.

\$26,918 to purchase an image analysis system for an in-vivo microscope. This system can be used for the dynamic measurement of ions and signaling molecules in isolated cells or microvessels, or in intact microvascular networks. This system is located in the laboratory of Dr. Jefferson Frisbee

\$11,077 to purchase a printer for scientific posters. This printer, which is available to all Center faculty, fellows and students, can produce high-quality posters of various sizes for presentation of scientific findings at national and international meetings. This printer is currently located in shared space near the laboratory of Dr. Fred Minnear.

\$4,171 to purchase a computer and professional software, and for consultant fees, for the creation and maintenance of the Center website. This computer is located in the laboratory of Dr. Tim Nurkiewicz.



Graduate Education: Students Currently Being Trained by Center Faculty



Ph.D.Students	Advisor	Graduate Program
Phoebe Adams	Paul Gordon	Exercise Physiology
Brian Griffith	Lisa Salati	Biochemistry and Molecular Pharmacology
Daniel Hernandez	Kevin Larkin	Adult Clinical Psychology
Alison Kohan	Lisa Salati	Biochemistry and Molecular Pharmacology
Paul Marvar, M.S.	Matthew Boegehold	Cellular and Integrative Physiology
Benjamin Parker, M.A.	Kevin Larkin	Adult Clinical Psychology
Ed Pistilli	Paul Gordon	Exercise Physiology
Indrani Talukdar	Lisa Salati	Biochemistry and Molecular Pharmacology
Brandie Taylor, M.A.	Kevin Larkin	Adult Clinical Psychology
Mei Xu	Fred Minnear	Cellular and Integrative Physiology
Wentao Zhang	Fred Minnear	Cellular and Integrative Physiology
M.D. – Ph.D. Students		
Julie Balch Somora	Matthew Boegehold	Cellular and Integrative Physiology
Andrew Beardsley	Jun Liu	Cellular and Integrative Physiology
Carl Shrader	Frank Reilly	Neurobiology and Anatomy

Center Activities

Our faculty, fellows and students regularly participate in various Center-wide activities that enhance the academic and intellectual environment of not only the CIRCS, but also the WVU Health Sciences community as a whole.

I. CIRCS Seminar Series

The Center regularly invites nationally and internationally recognized researchers in various aspects of cardiovascular biology to visit our institution. These speakers not only present a high-profile seminar on their research, but also meet and interact with faculty, trainees and students throughout the HSC.

Dr. Edward Inscho, Department of Physiology, Medical College of Georgia.
"New Insights into the Mechanisms of Renal Microvascular Autoregulation".
February 5, 2004.

Dr. Julian Lombard, Department of Physiology, Medical College of Wisconsin.
"High Salt Diet and Resistance Vessel Function--New Verses to a Classic Song".
February 12, 2004.

Dr. Jefferson Frisbee, Department of Physiology, Medical College of Wisconsin.
"Peripheral Ischemia in the Obese Zucker Rat". March 18, 2004.

Dr. Joseph Unthank, Department of Surgery, Indiana University School of Medicine.
"How Does Endothelial Dysfunction Impair Collateral Growth? -Insight From Proteomic and Genomic Analysis". April 1, 2004.

Dr. Sunil Shaw, Department of Pathology, Harvard University Medical School.
"Actin Modulation of Endothelial Junctions". April 29, 2004.

Dr. Pamela Lloyd, Department of Medical Pharmacology & Physiology, University of Missouri School of Medicine.
"Angiogenic Signal Transduction: Regulation and Organization". May 6, 2004.

Dr. Carol Williams, Laboratory of Molecular Pharmacology, Guthrie Research Institute.
"Signaling by Muscarinic Acetylcholine Receptors to the Rho Family of Small GTPases; From the Cytoplasm to the Nucleus". May 20, 2004.

Dr. Christopher Hardin, Department of Medical Pharmacology & Physiology, University of Missouri School of Medicine.
"Form and Function: A Cytoarchitect's Guide to Metabolism". May 27, 2004.

Dr. Pin-Lan Li, Department of Pharmacology, Medical College of Wisconsin.
"Cyclic ADP-ribose Calcium Signaling and Its Redox Regulation in Arterial Smooth Muscle"
June 17, 2004.

II. CIRCS Research Conferences

Regular Center research conferences, held the last Tuesday of each month, are kept informal to maximize interaction among attendees. These conferences serve as a forum for investigators to present work in progress and seek valuable feedback from their colleagues, to explore the possibility of new collaborative arrangements, or to review and provide constructive criticism for each other's grant applications. Center faculty, students, fellows and residents, as well as any other interested individuals from the larger Health Sciences Center community, are encouraged to participate.

Date	Discussion Leader	Topic
Jan. 27, 2004	Dr. Timothy Nurkiewicz	Microvascular changes linked to particulate matter exposure
Feb. 24, 2004	Dr. Pingnian He	Leukocyte activation, reactive oxygen species, and microvessel permeability
Mar. 30, 2004	Dr. Lisa Salati	Understanding the cellular actions of polyunsaturated fatty acids
June 29, 2004	Dr. Mitch Finkel	Reversible myocardial dysfunction

Recruitment of Center Faculty

Through targeted recruitment of new faculty, the Center is committed to attracting additional investigators with the research interests, tools and expertise to complement those of our current members. In the first phase of this endeavor, we sought to recruit two new scientists. The search committee was comprised of Dr. Matthew Boegehold (Chair), Dr. Mitchell Finkel, Dr. Pingnian He, Dr. Jun Liu, Dr. Fred Minnear, Dr. Bill Neal, and Dr. Lisa Salati. This search, which was initiated in January, 2004, included publication of ads in *Science* and *The Physiologist*, and ad postings on the *Science Careers*, *APS Career Opportunities* and *Microcirculatory Society* websites. Personal letters were also sent to the chairs of all Biochemistry, Physiology and Pharmacology departments in the US, Puerto Rico, Canada and Mexico, to the chairs of Cardiology departments with a strong research focus, to the directors of independent cardiovascular or vascular biology research centers, and to the governing councils of various professional societies.

In response to these efforts, we received a total of 117 applications. After two months of screening, evaluation and deliberation, the Search Committee identified 8 finalists from this applicant pool, and these individuals were invited to visit WVU, present a research seminar, and formally interview for a Center position. These visits were made from late April to late August of 2004. The search committee's top candidate, Dr. Jefferson Frisbee from the Medical College of Wisconsin, accepted our offer, and has already moved to Morgantown and joined our Center. We have also made offers to two more of the finalists, and are currently waiting for their decisions.

Center Space Development

A part of the interior space on the third floor of the Health Sciences North building will house the laboratories of newly recruited Center faculty, and also houses the laboratories of Dr. Boegehold, Dr. Frisbee and Dr. Minnear. The clustering of these laboratories, and the close proximity of most other Center faculty, will facilitate interdisciplinary scientific interactions within the Center.

As of August 1, 2004, the renovations to Dr. Frisbee's lab (Rooms 3144 and 3145, 3145A and 3145B, Health Sciences North) are being completed. In addition, renovation of the Center's permanent office space (Room 3152, HSN) has been completed, and is now occupied by Dr. Boegehold and Mrs. White. Renovation of the space housing the Center's new laser scanning confocal microscope (Room 3076, HSN) has also been completed. Finally, two unused laboratories (Rooms 3034 and 3131, HSN) are currently being emptied and cleaned for renovation and occupation by future Center faculty.

