

ACADEMIC VITA

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EDUCATIONAL BACKGROUND AND TRAINING

University of California, Berkeley, A.B. in Physical Education, 1980.
Wake Forest University, M.A. in Exercise Science, 1981.
Ball State University, Ph.D. in Human Bioenergetics, 1984.

HONORS

Phi Beta Kappa Scholar, University of California.
Honor Society, University of California.
Nu Sigma Psi, National Physical Education Honor Society.
Fellow, American College of Sports Medicine.
Nominated for the University Outstanding Achievement in Research Award, Iowa State University, 1999.
Superior Research Medallion, College of Education, Iowa State University, 2000.

ACADEMIC APPOINTMENTS

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| 1979-1980 | Research Assistant, Advanced Exercise Physiology Laboratory, University of California, Berkeley. |
| 1980-1981 | Wake Forest Graduate Fellow, Exercise Leader and Exercise Test Technologist, Wake Forest University, Winston-Salem, NC. |
| 1980-1981 | Instructor, Anatomy and Physiology Laboratory; Instructor, Freshman Physical Education; Wake Forest University, Winston-Salem, NC. |
| 1981-1984 | Doctoral Fellow in Human Bioenergetics, Ball State University, Muncie, IN. |
| 1981-1984 | Instructor, Undergraduate Anatomy; Teaching Assistant, Graduate Biochemistry Laboratory; Teaching Assistant, Graduate Laboratory Methods in Human Performance; Ball State University, Muncie, IN. |

ACADEMIC APPOINTMENTS

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| 1984-1987 | NIH Postdoctoral Research Trainee, Department of Medicine, Washington University School of Medicine, St. Louis, MO. |
| 1984-1987 | Instructor, Undergraduate Human Physiology; Instructor, Graduate Human Physiology; Instructor, Undergraduate Exercise Physiology; Instructor, Graduate Exercise Physiology; Washington University School of Medicine. |
| 1984-1986 | Staff Physiologist, United States Swimming Coaches College, United States Olympic Training Center, Colorado Springs, CO. |
| 1988-1989 | Instructor, Health Sciences Division, Las Positas College, Livermore, CA. |
| 1989-1995 | Assistant Professor, Department of Health and Human Performance, Iowa State University, Ames, IA. |
| 1995-2001 | Associate Professor, and Director, Exercise Biochemistry and Physiology Laboratory, Department of Health and Human Performance, Iowa State University, Ames, IA. Courtesy appointment in the Department of Veterinary Physiology and Pharmacology. |
| 2002-Present | Professor, and Director, Exercise Biochemistry and Physiology Laboratory, Department of Health and Human Performance, Iowa State University, Ames, IA. Appointments in the Department of Veterinary Physiology and Pharmacology and in the Department of Food Science and Human Nutrition. |

PROFESSIONAL MEMBERSHIPS AND ACTIVITIES, CERTIFICATIONS

- Fellow, American College of Sports Medicine
- Member, Nutritional Sciences Council, Iowa State University
- Member, Physiology Council, Iowa State University
- Member, Media Directory Listing, Public Information Department, ACSM
- Member, American Diabetes Association
- Certified Exercise Test Technologist, American College of Sports Medicine

JOURNALS REVIEWED FOR

- Reviewer, grants being administered by the Alberta Heritage Foundation of Medical Research, Alberta, Canada, 1991-92.
- Reviewer, grant applications for the National Health and Medical Research Council (Australia) for the Physiology and Cardiology Discipline Panel.
- Member, Special Emphasis Review Panel, National Institute Of Environmental Health (2001)
- Reviewer, American Journal of Physiology
- Reviewer, Journal of Applied Physiology
- Reviewer, Medicine and Science in Sports and Exercise
- Reviewer, International Journal of Sports Medicine
- Reviewer, International Journal of Sports Nutrition
- Reviewer, Journal of Science and Medicine in Sport
- Reviewer, Life Sciences

- Reviewer, Journal of Swimming Research
- Reviewer, Metabolism
- Reviewer, Sports Training, Medicine, and Rehabilitation
- Abstract Reviewer, Annual Meeting of the American College of Sports Medicine

OTHER PROFESSIONAL SERVICE

- Consultant, Campbell Soup Company. 'Factors influencing rehydration after exercise-induced dehydration'. 1996-1998.
- Participant, Media Directory of the American College of Sports Medicine. This listing, administered by the Public Information Department of ACSM, serves as a link between the public and researchers. 1997-present
- ISU Speakers Bureau. 1997-present.
- Contact person for the 5+5 Challenge, a community based health promotion program affiliated with McFarland Clinic. 1997-present.
- Chair, the Institutional Review Board for Mary Greeley Medical Center. 1996-present.
- Member, Human Subjects Committee for Experimental and Applied Sciences, Inc., Golden, CO. 1997-present.
- Roger A. Fielding, PhD (Boston University) presented a seminar 'Mechanisms of muscle injury' in 1996. I invited Dr. Fielding and funded his visit with grant monies.
- Mark Febbraio, PhD (University of Melbourne) presented a seminar 'Adrenergic regulation of carbohydrate metabolism during prolonged exercise' on June 24, 1998. I invited Dr. Febbraio and funded his visit with grant monies.
- Matthew D. Vukovich, PhD (Experimental and Applied Sciences, Inc.) presented a seminar 'Nutritional Concerns of Exercise Performance: An Overview of Dietary Supplements' on November 30, 1998.

REFEREED PUBLICATIONS

1. BROWN G.A., VUKOVICH M., and D.S. KING. Testosterone prohormone supplements. *Med Sci Sports Exerc.* 38(8):1451-61, 2006.
2. Brown GA, Vukovich MD, King DS. Urinary excretion of steroid metabolites after chronic androstenedione ingestion. *J Clin Endocrinol Metab.* Dec;89(12):6235-8, 2004.
3. Brown G.A., Dewey J.C., Brunkhorst J.A., Vukovich M.D., King D.S. Changes in serum testosterone and estradiol concentrations following acute androstenedione ingestion in young women. *Horm Metab Res.* 36(1):62-6, 2004.
4. Kohut M.L., J.R. Thompson, J. Campbell, G.A. Brown, M.D. Vukovich, D.A. Jackson, D.S. King. Ingestion of a dietary supplement containing dehydroepiandrosterone (DHEA) and androstenedione has minimal effect on immune function in middle-aged men. *J Am Coll Nutr.* 22(5):363-71, 2003.
5. MOELLER L.E., C.T. PETERSON, K.B. HANSON, S.B. DENT, D.S. LEWIS, D.S. KING, and D.L. ALEKEL. Isoflavone-rich soy protein prevents loss of hip lean mass but does not

- prevent the shift in regional fat distribution in perimenopausal women *Menopause*. Jul-Aug;10(4):322-31, 2003.
6. Brown G.A., E.R. Martini, B.S. Roberts, M.D. Vukovich, and D.S. King. Acute hormonal response to sublingual androstenediol intake in young men. *J Appl Physiol*. Jan;92(1):142-6, 2002.
 7. Brown G.A., Vukovich M.D, Martini E.R., Kohut M.L., Franke W.D., Jackson D.A., King D.S. Effects of androstenedione-herbal supplementation on serum sex hormone concentrations in 30- to 59-year-old men. *Int J Vitam Nutr Res*. 71(5):293-301, 2001.
 8. BROWN, G.A., M.D. VUKOVICH, E.R. MARTINI, M.L. KOHUT, W.D. FRANKE, D.A. JACKSON, AND D.S. KING. Endocrine and lipid responses to chronic androstenediol-herbal supplementation in 30-58 year old men. *J. Am. Coll. Nutri*. 20(5):520-528, 2001.
 9. ROSE, A.J., K. HOWLETT, D.S. KING, AND M. HARGREAVES. Effect of prior exercise on glucose metabolism in trained men. *Am. J. Physiol*. 281(4):E766-E771, 2001.
 10. BROWN, G.A., E.R. Martini, B. S. Roberts, M.D. Vukovich, AND D.S. King. Acute hormonal responses to sublingual androstenediol intake in young men. *J. Applied Physiol*. 92:142-146, 2002.
 11. PANTON, L.B., W.F. FRANKE, D.A. BLEIL, S.M BAIER, AND D.S. KING. Effects of resistance training on cardiovascular responses to lower body negative pressure in the elderly. *Clinical Physiol*. 21(5):605-611, 2001.
 12. BROWN, G.A. M.D. VUKOVICH, E.R. MARTINI, M.L. KOHUT, W.D. FRANKE, D.A. JACKSON, AND D.S. KING. Effects of androstenedione-herbal supplementation on serum sex hormone concentrations in 30-59 year old men. *Int. J. Vit. Nutri. Res*. 71(1):27-31, 2001.
 13. BROWN, G.A, M.D. VUKOVICH, E.R. MARTINI, M.L. KOHUT, W.D. FRANKE, D.A. JACKSON, AND D.S. KING. Endocrine responses to chronic androstenedione intake in 30-56 year old men. *J. Clin. Endocrinol. Metabolism*. (85)11:4074-4080, 2000.
 14. BROWN, G.A. M.D. VUKOVICH, T.A. REIFENRATH, N.L. UHL, K.A. PARSONS, R.L. SHARP, AND D.S. KING. Effects of anabolic precursors on serum testosterone concentrations and adaptations to resistance training in young men. *Int J Sport Nutr Exerc Metab*. 10(3):340-59, 2000.
 15. BROWN, G.A., M.D. VUKOVICH, R.L. SHARP, T.A. REIFENRATH, K.A. PARSONS, AND D.S. KING. Effect of oral dehydroepiandrosterone on serum testosterone and adaptations to resistance training. *J. Appl. Physiol*. 87(6):2274-2283, 1999.
 16. KING, D.S., R.L. SHARP, M.D. VUKOVICH, G.A. BROWN, T.A. REIFENRATH, N.L. UHL, AND K.A. PARSONS. Effect of oral androstenedione on serum testosterone and adaptations to resistance training in young men. *JAMA*, 281(21):2020-2028, 1999.
 17. PARCELL, A.C., M.L. RAY, K.A. MOSS, T.M. RUDEN, R.L. SHARP, AND D.S. KING. The effect of encapsulated soluble fiber on carbohydrate metabolism during exercise. *Int. J. Sports Nutr*. 9:1-11, 1999.
 18. RAY, M.L., M.W. BRYAN, T.M. RUDEN, S.M. BAIER, R.L. SHARP, AND D.S. KING. The effect of sodium in a rehydration beverage when consumed as a fluid or meal. *J. Appl. Physiol*. 85(4):1329-1336, 1998.
 19. Vukovich, M.D., R.L. Sharp, L. Kesl, D. Shaulis, AND D.S. King. Effects of a low-dose amino acid supplement on adaptations to cycling training in untrained individuals. *Int. J. Sports Nutr*. 7(4):298-309, 1997.

20. KING, D.S., P.J. BALDUS, R.L. SHARP, L.D. KESL, T.L. FELTMEYER, AND M.S. Riddle. Time course for exercise-induced alterations in insulin action and glucose tolerance in middle-aged people. *J. Appl. Physiol.* 78(1):17-22, 1995.
21. O'Sullivan, S. D.S. King, AND R.L. Sharp. Effect of carbohydrate feedings on performance in swim training. *J. Swim. Res.* 10:35-40, 1994.
22. KING, D.S., T.L. FELTMEYER, P.J. BALDUS, R.L. SHARP, AND J.G. NESPOR. Effects of eccentric exercise on insulin secretion and action in humans. *J. Appl. Physiol.* 75(5): 2151-2156, 1993.
23. MARTIN, W.H. III, G.P. DALSKY, B.F. HURLEY, D.E. MATTHEWS, D.M. BIER, J.M. HAGBERG, M.A. ROGERS, D.S. KING, AND J.O. HOLLOSZY. Effect of endurance training on plasma free fatty acid turnover and oxidation during exercise. *Am. J. Physiol.* 265:E708-E714, 1993.
24. BOUREY, R.E., W.M. KOHRT, J.P. KIRWAN, M.A. STATEN, D.S. KING, AND J.O. HOLLOSZY. Relationship between glucose tolerance and glucose-stimulated insulin response in 65-year-olds. *J. Gerontology: Med. Sci.* 48(4):M122-M127, 1993.
25. KOHRT, W.M., J.P. KIRWAN, M.A. STATEN, R.E. BOUREY, D.S. KING, AND J.O. HOLLOSZY. Insulin resistance of aging is related to abdominal adiposity. *Diabetes.* 42:273-281, 1993.
26. VUKOVICH, M.D., R.L. SHARP, D.S. KING, AND K. KERSHISHNIK. The effect of protein supplementation on lactate accumulation during submaximal and maximal exercise. *Int. J. Sports Nut.* 2(4):307-316, 1992.
27. COGGAN, A.R., R.J. SPINA, D.S. KING, M.A. ROGERS, M. BROWN, P.M. NEMETH, AND J.O. HOLLOSZY. Skeletal muscle adaptations to endurance training in 60-69 year old men and women. *J. Appl. Physiol.* 72(5):1780-1786, 1992.
28. COGGAN, A.R., R.J. SPINA, D.S. KING, M.A. ROGERS, M. BROWN, P.M. NEMETH, AND J.O. HOLLOSZY. Histochemical and enzymatic comparison of the gastrocnemius muscle of young and elderly men and women. *J. Gerontology: Biol. Sci.* 47(3):B71-B76, 1992.
29. BRODOWICZ, G.R., D.S. KING, AND P.M. RIBISL. Effect of toeclip use during cycle ergometry on ventilatory threshold and VO₂max in trained cyclists and runners. *Ergonomics.* 34(1):49-56, 1991.
30. BOUREY, R.E., A.R. COGGAN, W.M. KOHRT, J.P. KIRWAN, D.S. KING, AND J.O. HOLLOSZY. Effect of exercise on glucose disposal: response to a maximal insulin stimulus. *J. Appl. Physiol.* 69(5):1689-1994, 1990.
31. KING, D.S., M.A. STATEN, W. KOHRT, W.E. CLUTTER, G.P. DALSKY, AND J.O. HOLLOSZY. Insulin secretory capacity in endurance trained and untrained young men. *Am. J. Physiol.* 259(22):E155-E161, 1990.
32. SINACORE, D.R., A. DELITTO, D.S. KING, AND S.J. ROSE. Type II fiber activation in electrical stimulation: a preliminary report. *Phys. Ther.* 70(7):416-422, 1990.
33. COGGAN, A., R.J. SPINA, M.A. ROGERS, D.S. KING, M. BROWN, P.M. NEMETH, AND J.O. HOLLOSZY. Histochemical and enzymatic characteristics of skeletal muscle in master athletes. *J. Appl. Physiol.* 68(5):1896-1901, 1990.
34. ROGERS, M.A., D.S. KING, J.M. HAGBERG, A.A. EHSANI, AND J.O. HOLLOSZY. Effect of 10 days of inactivity on glucose tolerance in master athletes. *J. Appl. Physiol.* 68(5):1833-1843, 1990.

35. HAGBERG, J.M., D.S. KING, M.A. ROGERS, S.J. MOUNTAIN, S.M. JILKA, W. KORHT, AND S.L. HELLER. Exercise and recovery ventilatory and O₂ responses of patients with McArdle's disease. *J. Appl. Physiol.* 68(4):1393-1398, 1990.
36. ROGERS, M.A., C. YAMAMOTO, D.S. KING, J.M. HAGBERG, A.A. EHSANI AND J.O. HOLLOSZY. Improvement in glucose tolerance after one week of exercise in patients with mild NIDDM. *Diabetes Care.* 11(8):613-618, 1988.
37. YOUNG, D.A., D.S. KING, B. NORRIS, AND P. NEMETH. A novel method for measurement of triglyceride lipase activity: suitable for microgram and nanogram quantities of tissue. *J. Lipid Res.* 29:527-532, 1988.
38. KING, D.S., G.P. DALSKY, W.E. CLUTTER, D.A. YOUNG, M.A. STATEN, P.E. CRYER, AND J.O. HOLLOSZY. Effects of lack of exercise on insulin secretion and action in trained subjects. *Am. J. Physiol.* 254:E537-E542, 1988.
39. KING, D.S., G.P. DALSKY, W.E. CLUTTER, D.A. YOUNG, M.A. STATEN, P.E. CRYER, AND J.O. HOLLOSZY. Effects of exercise and lack of exercise on insulin sensitivity and responsiveness. *J. Appl. Physiol.* 64(5):1942-1946, 1988.
40. KING, D.S., G.P. DALSKY, M.A. STATEN, W.E. CLUTTER, D.R. VAN HOUTEN, AND J.O. HOLLOSZY. Insulin action and secretion in endurance-trained and untrained humans. *J. Appl. Physiol.* 63(6):2247-2252, 1988.
41. FIELDING, R.A., D.L. COSTILL, W.J. FINK, D.S. KING, J.E. KOVALESKI, AND J.P. KIRWAN. Effects of pre-exercise carbohydrate feedings on muscle glycogen use during exercise in well-trained runners. *Eur. J. Appl. Physiol.* 56:225-229, 1987.
42. HARGREAVES, M., D.L. COSTILL, W.J. FINK, D.S. KING, AND R. A. FIELDING. Effect of pre-exercise carbohydrate feedings on endurance cycling performance. *Med. Sci. Sports Exerc.* 19(1):33-36, 1987.
43. SHARP, R.L., D.L. COSTILL, W.J. FINK, AND D.S. KING. Effects of eight weeks of bicycle ergometer sprint training on human muscle buffer capacity. *Intl. J. Sports Med.* 7:13-17, 1986.
44. COSTILL, D.L., D.S. KING, R. THOMAS, AND M. HARGREAVES. Effects of reduced training on muscular power in swimmers. *Phys. Sports Med.* 13(2):94-101, 1985.
45. COSTILL, D.L., J. KOVALESKI, D. PORTER, J. KIRWAN, R. FIELDING, AND D.S. KING. Energy expenditure during front crawl swimming: predicting success in middle distance events. *Intl. J. Sports Med.* 6:266-270, 1985.
46. ARMSTRONG, L.E., D.L. COSTILL, W.J. FINK, D. BASSETT, M. HARGREAVES, I. NISHIBATA, AND D.S. KING. Effects of dietary sodium on body and muscle potassium content during heat acclimation. *Eur. J. Appl. Physiol.* 54:391-397, 1985.
47. KING, D.S., D.L. COSTILL, W.J. FINK, M. HARGREAVES, AND R.A. FIELDING. Muscle metabolism during exercise in the heat in unacclimatized and acclimatized humans. *J. Appl. Physiol.* 59(5):1350-1354, 1985.
48. FIELDING, R.A., D.L. COSTILL, W.J. FINK, D.S. KING, AND M. HARGREAVES. Effect of carbohydrate feeding frequencies and dosage on muscle glycogen use during exercise. *Med. Sci. Sports Exerc.* 17(4):472-476, 1985.
49. COSTILL, D.L., W.J. FINK, M. HARGREAVES, D.S. KING, R.S. THOMAS, AND R. FIELDING. Metabolic characteristics of skeletal muscle during detraining from competitive swimming. *Med. Sci. Sports Exerc.* 17(3):339-343, 1985.

50. KATZ, A., R.L. SHARP, D.S. KING, D.L. COSTILL, AND W.J. FINK. Effect of high intensity interval training on 2,3 diphosphoglycerate at rest and after maximal exercise. *Eur. J. Appl. Physiol.* 52:331-335, 1984.
51. KATZ, A., R.L. SHARP, L.E. ARMSTRONG, AND D.S. KING. Oxygen tension in antecubital blood of trained and untrained males following maximal leg exercise. *Can. J. Appl. Sports Sci.* 9(1):11-15, 1984.
52. KATZ, A., D.L. COSTILL, D.S. KING, M. HARGREAVES, AND W.J. FINK. Maximal exercise tolerance after induced alkalosis. *Intl. J. Sports Med.* 5(2):107-110, 1984.
53. SHARP, R.L., L.E. ARMSTRONG, D.S. KING, AND D.L. COSTILL. Buffer capacity of blood in trained and untrained males. *Proc. Fifth Intl. Symp. Biochem. Exercise.* V:595-599, 1983.
54. REJESKI, W.J., G. BRODOWICZ, D. KING, AND P. RIBISL. Salience of perceptual cues during cycling: do training and instrumentation moderate ratings of perceived exertion? *Percep. Motor Skills.* 54:823-829, 1982.

PUBLICATIONS IN REVIEW

1. KOHUT, M.L., J.R. THOMPSON, J. CAMPBELL, G.A. BROWN, M.D. VUKOVICH, AND D.S. KING. Ingestion of a dietary supplement containing dehydroepiandrosterone (DHEA) and androstenedione has minimal effect on immune function in middle-aged men. *J. Neuroimmunology.*
2. RAY, M.L., R.L. SHARP, S.D. O' SULLIVAN, K.A. MOSS, T.M. RUDEN, AND D.S. KING. Rehydration after exercise and thermal dehydration: Effect of electrolyte concentration. *J. Sci. Med. Sport.*
3. MOELLER, L.E., C.T. PETERSON, K.B. HANSON, S.B. DENT, D.S. LEWIS, D.S. KING, AND D.L. ALEKEL. Isoflavone-rich soy protein prevents loss of hip lean mass, but does not prevent the shift in regional fat distribution in perimenopausal women. *Menopause*

REFEREED SCIENTIFIC PRESENTATIONS

1. BROWN, G.A. E.R. MARTINI, B.S. ROBERTS, M.D. VUKOVICH, AND D.S. KING. Effects of sublingual androstenediol-cyclodextrin on serum sex hormones in young men. Annual Meeting, American College of Sports Medicine. Baltimore, MD, IN. June 2001. *Med. Sci. Sports*
2. BROWN, G.A., M.L. KOHUT, W.D. FRANKE, D.A. JACKSON, M.D. VUKOVICH, AND D.S. KING. Serum hormonal and lipid responses to androgenic supplementation in 30 –59 year old men. Annual Meeting, American College of Sports Medicine. Indianapolis, IN. June 2000. *Med. Sci. Sports Exerc.*

3. D.S. KING, G.A. BROWN, M.D. VUKOVICH, M.A. KOHUT, W.F. FRANKE, AND D. JACKSON. Effects of Chronic Oral Androstenedione Intake in 30-58 year Old Men. International Meeting on The Biochemistry of Exercise. Little Rock, AR. June 2000.
4. PARSONS, K.A., R.L. SHARP, G.A. BROWN, T.A. REIFENRATH, N.L. UHL, AND D.S. KING. Acute effects of oral anabolic-androgenic supplements on blood androgen and estrogen levels in man. Annual Meeting, American College of Sports Medicine. Seattle, Washington. June 3, 1999. *Med. Sci. Sports Exerc.*
5. BROWN, G.A., T.A. REIFENRATH, N.L. UHL, R.L. SHARP, AND D.S. KING. Oral Anabolic-androgenic Supplements during resistance training: effects on glucose tolerance, insulin action and blood lipids. Annual Meeting, American College of Sports Medicine. Seattle, Washington. June 3, 1999. *Med. Sci. Sports Exerc.*
6. D.S. KING, FACSM, R.L. SHARP, .A. BROWN, T.A. REIFENRATH, AND N.L. UHL. Oral anabolic-androgenic supplements during resistance training: effects on serum testosterone and estrogen concentrations. Annual Meeting, American College of Sports Medicine. Seattle, Washington. June 3, 1999. *Med. Sci. Sports Exerc.*
7. REIFENRATH, T.A., R.L. SHARP, G.A. BROWN, N.L. UHL, AND D.S. KING. Oral anabolic-androgenic supplements during resistance training: effects on body composition and muscle strength. Annual Meeting, American College of Sports Medicine. Seattle, Washington. June 3, 1999. *Med. Sci. Sports Exerc.*
8. S. BAIER, L. PANTON, M. RAY, M. BRYAN, W. FRANKE, R. FIELDING, and D. KING. Effects of heavy resistance training on muscle strength and morphology in the elderly. Annual Meeting, American College of Sports Medicine. Orlando, Florida. June 3, 1998. *Med. Sci. Sports Exerc.*
9. FRANKE, W.D., D.A. WERMERSEN, AND D.S. KING. Effects of post-exercise ischemia on forearm vascular conductance in heart transplant patients. Annual Meeting, American College of Sports Medicine. Orlando, Florida. June 3, 1998. *Med. Sci. Sports Exerc.*
10. KING, D.S., L.B. PANTON, S.M. BAIER, M.L. RAY, W.D. FRANKE, AND R.A. FIELDING. Impact of resistance training-induced changes in body composition and muscle size on insulin action in the elderly. Annual Meeting, American College of Sports Medicine. Orlando, Florida. June 3, 1998. *Med. Sci. Sports Exerc.*
11. BROEDER, C.E., L. PANTON, D.S. KING, J. GAMMON, AND S. STETTLER. Resistance training's effects on the health-risk profile of elderly individuals. Annual Meeting, SouthEastern Chapter of the American College of Sports Medicine. San Destin, Florida, January 30, 1998.
12. PANTON, L.B., D.S. KING, C.E. BROEDER, J. GAMMON, AND S. STETTLER. The effect of two years of resistance training on strength changes in elderly men and women. Annual Meeting, SouthEastern Chapter of the American College of Sports Medicine. San Destin, Florida, January 30, 1988.
13. PANTON, L.B., AND D.S. KING. Influence of resistance training on strength, fatigability, and plasma lactate during intense exercise in the elderly. Annual Meeting, American College of Sports Medicine. Denver, Colorado. May 28, 1997. *Med. Sci. Sports Exerc.* 29(5):S255, 1997.
14. Ray, M.L., T.M. Ruden, R.L. Sharp FACSM, S.M. Baier, M.W. Bryan, D.S. King. Effect of fluid Composition on rehydration. Annual Meeting, American College of Sports Medicine. Denver, Colorado. May 30, 1997. *Med. Sci. Sports Exerc.* 29(5):S133, 1997.

15. PARCELL, A.C., M.L. RAY, K.A. MOSS, T.M. RUDEN, R.L. SHARP, AND D.S. KING. The addition of soluble dietary fiber to pre-exercise carbohydrate feedings. Annual Meeting, Mid-Western Chapter, American College of Sports Medicine. St. Charles, Illinois, October 4, 1996.
16. RAY, M.L., R.L. SHARP, S.D. O'SULLIVAN, K.A. MOSS, T.M. RUDEN, A.C. PARCELL, AND D.S. KING. Rehydration after exercise and thermal-induced dehydration: effect of sodium concentration. Annual Meeting, American College of Sports Medicine. Cincinnati, Ohio, May 29-June 1, 1995. *Med. Sci. Sports Exerc.* 28(5):S201, 1996.
17. DeGabriele, J.H., L.B. Panton, AND D.S. King. Comparison of anaerobic power in elderly men and women. International Conference on Aging and Physical Activity. Colorado Springs, Colorado. October 7, 1995.
18. PARCELL, A.C., M.M. RAY, K.A. MOSS, R.L. SHARP, AND D.S. KING. Addition of soluble dietary fiber to pre-exercise carbohydrate feedings: effects on substrate availability and endurance performance. Annual Meeting, American College of Sports Medicine. Cincinnati, Ohio, May 29-June 1, 1996. *Med. Sci. Sports Exerc.* 28(5): S90, 1996.
19. RUDEN, T.M. A.C PARCELL, M.L. RAY, K.A. MOSS, J.L. SEMLER, R.L. SHARP, G.W. ROLFS AND D.S. KING. Effects of oral creatine supplementation on performance and muscle metabolism during maximal exercise. Annual Meeting, American College of Sports Medicine. Cincinnati, Ohio, May 29-June 1, 1996. *Med. Sci. Sports Exerc.* 28(5):S81, 1996.
20. KING, D.S., J.L. SEMLER, L.B. PANTON, T.M. RUDEN, K.A. MOSS, AND M.L. RAY. Effect of resistance training on glucose tolerance and insulin sensitivity in the elderly. Annual Meeting, American College of Sports Medicine. Cincinnati, Ohio, May 29-June 1, 1996. *Med. Sci. Sports Exerc.* 28(5):S104, 1996.
21. MASON, M.L. L.B. PANTON, AND D.S. KING. Influence of age and gender on fatigability and plasma lactate accumulation during intense muscular contractions. Annual Meeting, American College of Sports Medicine. Cincinnati, Ohio, May 29-June 1, 1996. *Med. Sci. Sports Exerc.* 28(5):S139, 1996.
22. O' SULLIVAN S.D, R.L. SHARP AND D.S. KING. Influence of carbohydrate ingestion on interval training performance in intercollegiate male swimmers. Annual Meeting, American College of Sports Medicine. Minneapolis, Minnesota, May 31-June 3, 1995. *Med. Sci. Sports Exerc.* 27(5):S13, 1995.
23. LOUK, J.L., K.A. Moss, R.L Sharp, R.L. Engen, AND D.S. KING. Effect of induced alkalosis on 1500 m run time. Annual Meeting, American College of Sports Medicine. Minneapolis, Minnesota, Washington, May 31-June 3, 1995. *Med. Sci. Sports Exerc.* 27(5):S1141, 1995.
24. KING, D.S., P.J. BALDUS, T.L. FELTMEYER, AND R.L. SHARP. Time course for loss of improved glucose tolerance in middle-aged people. Annual Meeting, American College of Sports Medicine. Seattle, Washington, June 2-5, 1993. *Med. Sci. Sports Exerc.* 25(4)
25. SHRIVER, T.C., D.L. SHAULIS, S.R. THOMPSON, R.L. SHARP, AND D.S. KING. Effect of exercise intensity on glucose tolerance and insulin sensitivity. Annual Meeting, American College of Sports Medicine. Seattle, Washington, June 2-5, 1993. *Med. Sci. Sports Exerc.* 25(4)
26. SHARP, R.L., C.J. LOCKARD, D.S. KING, AND J.F. ROBYT. Effect of pre-exercise modified starch feedings on carbohydrate metabolism during endurance exercise. Annual Meeting, American College of Sports Medicine. Seattle, Washington, June 2-5, 1993. *Med. Sci. Sports Exerc.* 25(4)
27. KING, D.S., T.L. FELTMEYER, P.J. BALDUS, R.L. SHARP, AND J.G. NESPOR. Effect of eccentric exercise on insulin secretion and action in humans. Annual Meeting, American College of Sports Medicine. Dallas, TX, May 26-30, 1992. *Med. Sci. Sports Exerc.* 24(4)

28. MOORE, B.J., D.S. KING, L. KESL, T.L. FELTMEYER, P.J. BALDUS, R.L. SHARP, AND J.G. NESPOR. Effect of rapid dehydration and rehydration on work capacity and muscle metabolism during intense exercise in wrestlers. Annual Meeting, American College of Sports Medicine. Dallas, TX, May 26-30, 1992. *Med. Sci. Sports Exerc.* 24(4)
29. KOHRT, W., J. KIRWAN, R. BOUREY, M. STATEN, D. KING, AND J.O. HOLLOSZY. Exercise improves insulin action in 60- to 70- yr old men and women. Annual Meeting, Gerontological Society of America. San Francisco, California, November 22-26, 1991.
30. KIRWAN, J.P., W.M. KOHRT, M.A. STATEN, R.E. BOUREY, D.S. KING, AND J.O. HOLLOSZY. The effects of exercise training on the insulin response to hyperglycemia with aging. Annual Meeting, Gerontological Society of America. San Francisco, California, November 22-26, 1991.
31. VUKOVICH, M.D., R.L. SHARP, D.S. KING, AND K. KERSHISNIK. Effect of protein supplementation on lactate accumulation during submaximal and maximal exercise. Annual Meeting, American College of Sports Medicine. Orlando, FL, May 29-June 1, 1991. *Med. Sci. Sports Exerc.* 23(4):S34
32. SHARP, R.L., M. VUKOVICH, D. KING, L. KESL, AND D. SHAULIS. Effects of a commercial amino acid supplement on adaptations to cycle ergometer training. Annual Meeting, American College of Sports Medicine. Orlando, FL, May 29-June 1, 1991. *Med. Sci. Sports Exerc.* 23(4):S15
33. SPINA, R.J., A.R. COGGAN, M.A. ROGERS, D.S. KING, M. BROWN, P.M. NEMETH, AND J.O. HOLLOSZY. Endurance exercise training in older women: skeletal muscle adaptations. Annual Meeting, American College of Sports Medicine. Salt Lake City, Utah, May 22-25. 1990. *Med. Sci. Sports Exerc.*
34. KING, D.S., M.A. STATEN, W.M. KOHRT, G.P. DALSKY, D. ELAHI, AND J.O. HOLLOSZY. Influence of endurance training on insulin secretory capacity in humans. Annual Meeting, American College of Sports Medicine. Salt Lake City, Utah, May 22-25. 1990. *Med. Sci. Sports Exerc.* (:)
35. KERSHISNIK, K., M. VUKOVICH, S. THOMPSON, D.S. KING, AND R.L. SHARP. Effect of a protein supplement on lactate accumulation during submaximal and maximal exercise. Annual Meeting, Federation of American Societies of Experimental Biology. Washington, D.C., April 6, 1990.
36. HAGBERG. J.M. D.S. KING, M.A. ROGERS, S.J. MONTAIN, S.M. JILKA, W.M. KOHRT, AND S.L. HELLER. Exercise hyperventilation and recovery O₂ responses of McArdle's disease patients. Annual Meeting, Federation of American Societies of Experimental Biology. Anaheim, California, April 16, 1989.
37. BOUREY, R., W. KOHRT, M. STATEN, D. KING, AND J. HOLLOSZY. Glucose stimulated insulin response in the elderly. Annual Meeting, Gerontological Society of America. San Francisco, California, November 18, 1988.
38. COGGAN, A.R., R.J. SPINA, M.A. ROGERS, D.S. KING, M. BROWN, P.M. NEMETH, AND J.O. HOLLOSZY. Characteristics of skeletal muscle of master athletes. Annual Meeting, Gerontological Society of America. San Francisco, California, November 17, 1988.
39. D.S. KING, G.P. DALSKY, W.E. CLUTTER, D.A. YOUNG, M.A. STATEN, D.R. Van HOUTEN, AND J.O. HOLLOSZY. Effects of exercise and lack of exercise on insulin secretion and action. Annual Meeting, American Diabetes Association. Indianapolis, Indiana, June 7, 1987.
40. KING, D.S., G.P. DALSKY, W.E. CLUTTER, D.A. YOUNG, M.A. STATEN, P.E. CRYER, AND J.O. HOLLOSZY. Effects of exercise and lack of exercise on insulin sensitivity and

- responsiveness in man. Annual Meeting, American College of Sports Medicine. Las Vegas, Nevada, May 26-29. 1987. *Med. Sci. Sports Exerc.* 19(2):S74)
41. SINACORE, D.R., E.F. COYLE, D.S. KING, J.M. HAGBERG, M.A. ROGERS, G.P. DALSKY, AND S.J. ROSE. Histochemical correlates of training-induced adaptations in the rate of recovery from a fatigue test. Annual Meeting, American Physical Therapy Association. San Antonio, Texas, June, 1987. (*Phys. Ther.* 67(5):784, 1987).
 42. SINACORE, D.R., E.F. COYLE, D.S. KING, M.A. ROGERS, G.P. DALSKY, G.J. PLANER, J.M. HAGBERG, AND S.J. ROSE. Changes in muscle fiber type as a result of endurance training and detraining. Annual Meeting, American Physical Therapy Association. San Antonio, Texas, June, 1987. (*Phys. Ther.* 67(5):765-766, 1987).
 43. ROGERS, M.A., C. YAMAMOTO, D.S. KING, J.M. HAGBERG, AND J.O. HOLLOSZY. Effect of 7 days of exercise training on glucose tolerance and insulin resistance in older patients with Type II diabetes. Annual Meeting, Gerontological Society of America. Chicago, Illinois, November 14, 1986.
 44. COSTILL, D.L., W. FINK, M. HARGREAVES, D. KING, R. THOMAS, AND R. FIELDING. Muscle respiratory capacity and endurance during detraining in competitive swimmers. Annual Meeting, American College of Sports Medicine. Nashville, Tennessee, May 26-29. 1985. *Med. Sci. Sports Exerc.* 17(2):227)
 45. KING, D.S., D.L. COSTILL, W.J. FINK, M. HARGREAVES, R.A. FIELDING, E.V. DOVER, AND J.E. KOVALESKI. Muscle metabolism during exercise in the heat in man: effect of acclimatization. Annual Meeting, American College of Sports Medicine. Nashville, Tennessee, May 26-29. 1985. *Med. Sci. Sports Exerc.* 17(2):185)
 46. ARMSTRONG, L.E., D.L. COSTILL, W.J. FINK, D. BASSETT, M. HARGREAVES, I. NISHIBATA, AND D.S. KING. Effects of high and low sodium intake on intramuscular and body potassium content during heat acclimation. Annual Meeting, American College of Sports Medicine. San Diego, California, May 23-26, 1984. *Med. Sci. Sports Exerc.* 16(2):137)
 47. HARGREAVES, M., D.L. COSTILL, A. KATZ, D.S. KING, AND W.J. FINK. Effect of pre-exercise carbohydrate feedings on muscle glycogen utilization. Annual Meeting, American College of Sports Medicine. San Diego, California, May 23-26, 1984. *Med. Sci. Sports Exerc.* 16(2):191)
 48. KING, D.S., L.E. ARMSTRONG, R.L. SHARP, B.W. CRAIG, AND D.L. COSTILL. Buffer capacity of red and white mammalian skeletal muscle. Annual Meeting, American College of Sports Medicine. San Diego, California, May 23-26, 1984. *Med. Sci. Sports Exerc.* 16(2):143)
 49. KATZ, A. D.L. COSTILL, D.S. KING, M. HARGREAVES, AND W.J. FINK. Effect of oral alkalizer on maximal exercise tolerance. Annual Meeting, American College of Sports Medicine. Montreal, Quebec, Canada, May 18-21, 1983. *Med. Sci. Sports Exerc.* 15(2):126)
 50. SHARP, R.L. D.L. COSTILL, W.J. FINK, AND D.S. KING. The effects of eight weeks of sprint training on the buffer capacity of muscle in man. Annual Meeting, American College of Sports Medicine. Montreal, Quebec, Canada, May 18-21, 1983. *Med. Sci. Sports Exerc.* 15(2):116)
 51. KING, D.S., R.L. SHARP, D.L. COSTILL, AND A.C. SNYDER. Power characteristics of world-class swimmers: relationship to freestyle swimming performance. Annual Meeting, American College of Sports Medicine. Montreal, Quebec, Canada, May 18-21, 1983. *Med. Sci. Sports Exerc.* 15(2):161)
 52. BRODOWICZ, G.R., D.S. KING, P.M. RIBISL, W.T. BOONE, AND H.S. MILLER, Jr. Anaerobic threshold during cycle ergometry with and without toeclips. Annual Meeting, American College of Sports Medicine. Minneapolis, Minnesota, May 26-29, 1982. *Med. Sci. Sports Exerc.* 14(2):161).

53. KING, D.S., G.R. BRODOWICZ, AND P.M. RIBISL. Effect of toeclip use on maximal oxygen uptake during bicycle ergometry in competitive cyclists and trained non-cyclists. Annual Meeting, American College of Sports Medicine. Minneapolis, Minnesota, May 26-29, 1982. *Med. Sci. Sports Exerc.*14(2):147).

LAY PUBLICATIONS

1. EICHNER, E.R., D. KING, M. MYHAL, B. PRENTICE, AND T.N. ZIEGENFUSS. Muscle Builder Supplements. Gatorade Sport Science Exchange Roundtable. 10(3):37:1-5, 1999.
2. COSTILL, D.L., D.S. KING, A. HOLDREN, AND M. HARGREAVES. Sprint speed vs. swimming power. *Swim Tech.* 20(1)20-22, 1983.
3. SHARP, R.L., D.S. KING, and D.L. COSTILL. Power characteristics of elite male and female competitive swimmers. *American Swimming Coaches Association Newsletter.* March, 1983.
4. COSTILL, D.L., D.S. KING, M. HARGREAVES, AND A. HOLDREN. The facts are in: stress those sprint muscles and increase performance. *Swim Swim.* 2:13-14, 1984.
5. COSTILL, D.L., AND D.S. KING. Workout Evaluation. *Swim Tech.* 20(2)24-27, 1983.

INVITED PRESENTATIONS

1. June 1, 2002. First Conference on The Physiology of Exercise. Section of Applied Physiology, Washington University School of Medicine. King D.S., G.P. Dalsky, M.A. Staten, W.E. Clutter, D.R. Van Houten, AND J.O. Holloszy. Endurance training, insulin action and insulin secretion.
2. June 1, 2002. First Conference on The Physiology of Exercise. Section of Applied Physiology, Washington University School of Medicine. King D.S., M.A. Staten, W.M. Kohrt, G.P. Dalsky, D. Elahi, AND J.O. Holloszy. Effect of endurance training on insulin secretory capacity in humans.
3. June 2, 2002. First Conference on The Physiology of Exercise. Section of Applied Physiology, Washington University School of Medicine. King, D.S., G.P Dalsky, AND D.A. Young. Insulin action and secretion in two well-trained and *very* competitive middle-aged men.
4. January 9, 2002. National Institutes of Health Office of Dietary Supplements/Council for Responsible Nutrition. "Muscle Building" Nutritional Supplements: Is Androstenedione An Anabolic Steroid?
5. March 15, 2002. Annual Meeting. Northeastern Chapter, American College of Sports Medicine. Efficacy and Safety of Androstenedione Intake.
6. Androgenic Supplements, Sex Hormones, and Resistance Training: "Are Testosterone Precursors Anabolic Agents?" Department of Health Sciences, Boston University, 17 August, 1999
7. Androgenic-Anabolic Supplementation: Effects on sex hormones, metabolism, and strength gains during resistance training. Department of Physiology, University of Melbourne Medical School, Melbourne, Victoria, Australia, 13 April, 1999.
8. Optimizing Rehydration after Exercise- and Thermal-Induced Dehydration. Nutritional Aspects of Exercise Seminar. School of Health Sciences, Deakin University, Burwood, Victoria, Australia, 8 May, 1999.
9. Effects of Androgenic-Anabolic Supplementation on Adaptations to Resistance Training in Humans. School of Health Sciences, Deakin University, Burwood, Victoria, Australia, 13 May, 1999.
10. Effects of Androgenic-Anabolic Supplementation on Adaptations to Resistance Training in Humans. Australian Institute of Sport, Canberra, A.C.T., 14 May, 1999.
11. Research Efforts on Exercise and Human Nutrition. Lecture to first year graduate students in Human Nutrition. October 21, 1998.
12. Exercise as Preventive Medicine: Does Exercise Cure What Ails You? ISU Women's Club. January 13, 1998.
13. Physiological and biochemical adaptations to resistance training in the elderly. Retired College of Education Faculty. October 22, 1996.
14. Exercise, insulin action and insulin secretion. Department of Food Science and Human Nutrition, 6 September, 1995.
15. Exercise, insulin sensitivity, and pancreatic function. Carbohydrate Metabolism and Exercise Seminar at Boston University. April 10, 1995.
16. Exercise in the heat. Interviewed by Joyce Russell of WOI radio, on June 23, 1993.
17. Effects of dehydration on muscle performance in wrestlers. H.H. Dukes Club, Physiology Council, February 10, 1993.

18. What Science Can Tell Us about Sprint and Endurance Training. Iowa State Coaches Meeting, December 10, 1993.
19. Time course of loss of glucose tolerance after exercise, Fall Physiology Council Minisymposium, Iowa State University, November 19, 1992.
20. Effect of eccentric exercise on insulin secretion and action in humans. Spring Physiology Council Minisymposium, Iowa State University, April 24, 1992.
21. Acute and Chronic Effects of Exercise on Insulin Secretion and Action in Humans. Veterinary Pharmacology and Physiology Seminar Series. February 3, 1992.
22. KING, D.S. Exercise: cure all or fad? *Sound Mind, Sound Body Symposium*. Las Positas College, Livermore, California. February 4, 1989. KING, D.S. Exercise your way to diabetes control. *Greater St. Louis Affiliate*, American Diabetes Association. April 14, 1985.
23. KING, D.S. Computer Use In Exercise Physiology. AAPHERD Annual Meeting. Indianapolis, Indiana. February 17, 1984.
24. KING, D.S. Monitoring Swim Training: physiological concepts and computer applications. *Symposium On Overtraining*. University of Virginia, Charlottesville, Virginia. June 25, 1984.
25. KING, D.S. Fluid and electrolyte requirements during exercise. *American Strength Coaching Symposium*. Anaheim, California. January 9, 1983.
26. KING, D.S. Evaluation of swimming performance: A Laymen's Approach. *Indiana Swim Coaches Association*. Muncie, Indiana. April 15, 1982.

CONTRACTS AND GRANTS

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| 2002 | KING, D.S. AND G.A. BROWN. World Anti Doping Agency . Effects of testosterone precursors on the muscular and hormonal responses to resistance training in men: \$558,005. Pending. |
| 2002 | KING D.S. Efficacy of an oral androgen spray. Venable Associates. \$200,604. Pending. |
| 2000 | KING, D.S., AND G.A. BROWN. California Raisin Marketing Board . The Glycemic Index Of Raisins Fed To Normal People And Non-Insulin Dependent Diabetics. \$110,869. Not Funded. KING, D.S., AND G.A. BROWN. California Raisin Marketing Board . The Effects Of Raisin Ingestion On Substrate Utilization and Endurance Exercise Performance In Trained Cyclists. \$ 84,258. Not Funded. |
| 1999 | KING, D.S., W.D. Franke, and M.L. Kohut. Experimental and Applied Sciences . Impact of age on the hormonal response to androgen supplementation.. Principal Investigator. \$105,680. Funded. |
| 1997 | KING, D.S. and R.L. Sharp. Experimental and Applied Sciences . Efficacy of Andro-6 in promoting changes in body composition and strength during resistance training. Principal Investigator. \$66,032. Funded. |

- 1996 **Center for Designing Foods to Improve Nutrition (CDFIN) - USDA Special Grants.** Do isoflavonoids from soy have proestrogenic effects during menopause? Co-Investigator. \$10,250. Funded.
- D.S. KING AND R.L. SHARP. **Campbell Soup Co.** *Effect of isotonic soup ingestion on rehydration following combined exercise- and thermal-induced dehydration.* \$93,000. Continuing Funding.
- KING, D.S., T. R. DERRICK, W.D. FRANKE, S. P. McLEAN L.B. PANTON, and R.L. SHARP. **College of Education, Iowa State University.** *Designation as A Research Signature Area: The Exercise BioDynamics Research Group.* \$45,000. Funded.
- PANTON, L.B., D.S. KING, W.D. FRANKE, S.P. McLEAN, and J. STORER. **College of Education, Iowa State University.** *Elderly Wellness Initiative.* \$12,500 per year for 5 years. Funded.
- PANTON, L.B., S. NISSEN, D. RICE, J.C. FULLER, S.P. McLEAN, D.S. KING, and N.N. ABUMRAD. **Department of Health and Human Services, Public Health Service.** *Enhancement of muscle function in elderly men and women.* \$100,000. Not Funded
- 1994-95 **Public Health Service.** *Enhancement of muscle function in elderly men and women.* \$100,000.00. Principal Investigator. Pending.
- Gatorade Sports Science Institute.** *Addition of soluble fiber to Pre-Exercise Carbohydrate Feedings: Effects on Substrate Use and Endurance Exercise Performance.* \$2,000. Principal Investigator. Funded.
- Sigma Kappa Foundation.** Physiological and biochemical adaptations to resistance training in elderly men and women. Co-Investigator. \$5,000. Funded.
- Campbell Soup Co.** *Effect of isotonic soup ingestion on rehydration following combined exercise- and thermal-induced dehydration.* Principal Investigator. \$93,000. Funded.
- 1991-94 **US Department of Agriculture.** *Human glycemic, metabolic, and digestive responses to modified starches.* \$ 93,632. Co-Investigator. Funded.
- 1991-92 **NIH Biomedical Research Support Grant (Iowa State University Research Grant). University Research Grant, Iowa State University.** *Effect of exercise on insulin secretion and insulin sensitivity in humans.* \$7,500.00 Principal Investigator. Funded. Continued from 1990.
- Iowa Science Foundation.** *Effect of eccentric exercise on insulin secretion and action in humans.* \$8,345.00. Principal Investigator. Not Funded.
- 1990-91 **Advanced Sport Nutrition Company, Inc.** *Effects of amino acid supplements on adaptation to training.* \$14,750.00. Co-Investigator. Funded.

University Research Grant, Iowa State University. *Effect of exercise on insulin secretion and insulin sensitivity in humans.* \$7,500.00 Principal Investigator. Funded.

Sigma Chemical Company, St. Louis. *Equipment grant: exploratory studies on exercise and plasma creatine phosphokinase levels.* \$223.00 Principal Investigator. Funded.

Diabetes Research and Education Foundation. *Enhanced insulin action following exercise in older people: time course and role of muscle glycogen depletion.* \$19,917.00. Principal Investigator. Approved, Not Funded.

1989-90 **NIH Biomedical Research Support Grant (Iowa State University Research Grant).** *Time course for reversal of exercise-induced increase in insulin action and glucose tolerance in older people.* \$7,500.00. Principal Investigator. Funded.

College of Education, Iowa State University. *The effect of exercise on insulin sensitivity and pancreatic function.* \$6340.00. Principal Investigator. Funded.

Department of Physical Education. Equipment grant for purchase of an automatic glucose analyzer. \$7290.00. Principal Investigator. Funded.

Iowa Affiliate, American Heart Association. Time course for reversal of exercise-induced increase in insulin action and glucose tolerance in older people. \$14,250.00. Principal Investigator. Not Funded.

1986 **National Institutes of Health.** *Exercise-induced biochemical and anatomic adaptations.* \$757,556.00 for 5 years. Co-Investigator. Funded.

1984-87 **National Institutes of Health.** *National Research Service Award.*

1981-82 **American Swimming Coaches Association.** *Power levels among elite competitive swimmers.* \$3,000. Co-Investigator. Funded