



Health & Human *Performance*



Annual Report

2004 - 2005 Academic Year



University of Houston
College of Education



COLLABORATION
FOR LEARNING & LEADING

The Department of Health and Human Performance College of Education – University of Houston

The 2004-2005 Academic Year was another great year for the Department of Health and Human Performance (HHP). Building upon the successes of the previous years, the department continued to make significant forward strides in the area of research, academics, and service. This progress was reflected in 41 peer reviewed research articles, 57 scientific presentations, curriculum revisions, personnel increases, and continued improvement in the quality of graduate students. Additionally, the department received \$1,059,263.00 in new funding to support research and other projects. This is the greatest amount of funding ever generated by the department.

Improvements to the Garrison-Melcher Complex

The improvements to the Garrison-Melcher complex continued throughout the year. The upgrades to the classrooms were completed just in time for the start of the academic year. The once drab classrooms are now full of color and modern teaching technology. The new classrooms in what was once the old Garrison student locker room also come “online” during the fall semester. The 2nd floor hallway of Melcher Gymnasium was completely renovated with the addition of color, modern materials and several display cases. Working with several campus offices, an agreement was formulated that will enable the development of the older Garrison showers into first class “project” space. This agreement also includes the future refurbishing of the stairwells and the development of a student lounge. The HHP students are primarily responsible for the student lounge as they received over 700 signatures on a petition that was delivered to the provost. The new “physical assessment center” was furnished and the DXA scanning machine was housed in one of the center’s rooms. The process of installing a sprinkler system was initiated during the year with many of the second floor rooms being completed. Cameras were installed in the LIP in effort to improve laboratory security. Additionally, the COE Dean’s office and Office of Graduate Research provided significant funding which is being used to substantially improve the laboratory capabilities of Garrison room 204. Finally, Dr. Martinez has established an HHP presence in the newly developed Bioengineering Laboratory in the UH College of Engineering.

Academics

The fully online” MED welcomed many new students, included those studying in New York, Florida, and California. The HHP MED committee worked towards developing standardized procedures to administer both traditional and online students, particularly in the area of comprehensive exams. An ad hoc committee was assembled to provide information about our student’s current GPAs and the GPA’s they carried when they entered the program. The data provided by the ad hoc committee was further analyzed to determine that if the GPA program admission standard was raised would there be an adverse impact upon a particular segment of our student population. The data revealed that raising the standards would not adversely impact a particular group of students and the HHP faculty subsequently voted to raise our GPA admission standard to 2.3. Within the context of the Graduate Research Degrees committee (GRD), the members of the “health” faculty decided to terminate the Ed.D. in Allied Health Education and Administration program and explore the option of developing a Ph.D. in a health-related area. The GRD committee developed an extensive self-study document of the Kinesiology Ph.D. program. Subsequently, an external review committee visited our department to conduct an evaluation of the program. This committee contained faculty from the University of Texas at Austin, Purdue University and the Baylor College of Medicine. The committee provided a very favorable review of the program and recommendations to further strengthen the program.

Research

This past year saw the greatest increase in funding for research in the history of the department. This increase was headed by the landing of our department's first NIH-RO1 grant awarded to Dr. Rebecca Lee. This grant is titled "Maintaining Physical Activity in Ethnic Minority Women" and will provide 3.3 million dollars over the next 5 years to support the Dr. Lee's research. HHP professors were awarded a total of \$1,059,263.00 for just the 2004-2005 academic year, when combined with promised future funding, the faculty were awarded 5.6 million dollars during the years. A successful year indeed! The department also took further strides to continue to increase their visibility and productivity in the focus areas of urban fitness, obesity, and high risk health behaviors. A complete listing of publications, presentations and funding can be found on pages 4-15. In general more students became actively involved in research studies and Dr. McFarlin was awarded funding from a university program to support the inclusion of undergraduates in his research. In August, we established a one-of-a-kind program with the Spirit of Houston Marching Band where Drs. Bush and Sharma and our students provide basic fitness and nutritional assessment to every member of the march band, including the UH cheerleaders. In February, our department hosted the 1st Annual HHP research day with both professors and graduate students presenting their current research to our undergraduates. A comprehensive listing and description of the varied research projects which are faculty are involved in can be found on pages 22-49. Our faculty also maintained their active collaborations with NASA, the many organizations in the Texas Medical Center, and across the UH campus. Next year promises to be even more productive with the addition of new faculty member and the maturing of our on-going projects.

Personnel

Drs. Mark Clarke and Norma Olvera were awarded tenure and Dr. Olvera was promoted to associate professor.

Shreela Sharma (epidemiology and nutrition) and Max Kurz (motor control and biomechanics) joined our faculty as assistant professors.

Dr. Lisa Alastuey (health education) joined our faculty as a visiting assistant professor.

Kerry Lee joined our research faculty through the Office of Data Analysis and Dissemination funded by Wyle Life Sciences.

Assistant professors Warren Whisenant, Whitney Boling, and Brian Sekula left to pursue other opportunities.

Professor Andrew 'Tony' Jackson moved into a part time position and will focus his efforts on the TIGER study.

Erin Prevett was promoted to Academic Advisor I and continued to advise Health and Nutrition majors.

Diana Abuamer was hired to serve as the Academic Advisor for the online MED degree.

Department Statistics

Faculty

5 Professors
6 Associate Professors
5 Assistant Professors
3 Clinical Professors

Staff

2 full time staff supported by UH Central
5 staff supported by student fees and IDC
3 part time staff providing Webpage support funded by student fees

Total Full and Part Time Employees - 85

Total Undergraduate Majors (2005) – 1084

Total Graduate Majors (2005) - 95

Total Students Enrolled for “Activity” Courses – 2,051

Ph.D. awarded (2000-2005) – 4

Faculty Peer Reviewed Articles (2000-2005) - 41

Faculty Scientific Presentations (2000-2005) - 57

Faculty Research Funding (2005) - \$1,059,263.34

Student Numbers - Fall 2004

Undergraduate	Fall 2004
B.S. in Health	242
B.S. in Human Nutrition and Foods	166
B.S. in Kinesiology (undefined)	198
B.S. in Kinesiology - Exercise Science	241
B.S. in Kinesiology - Movement and Sport Studies Track I	110
B.S. in Kinesiology - Sport Administration	127
	1084
 Graduate	 Fall 2004
Ed.D. in Allied Health	13
M.Ed. in Health Education	12
M.Ed. in Physical Education	37
M.S. in Exercise Science	12
Ph.D. in Kinesiology	21
	95
 Total academic students	 1179
 Activity courses	 1029
 Total students served	 2208

Degrees Conferred

B.S. in Health – 34

1 Summa Cum Laude
6 Magna Cum Laude
5 Cum Laude

B.S in Human Nutrition and Foods – 37

3 Summa Cum Laude
3 Magna Cum Laude
4 Cum Laude

B.S. in Kinesiology: Exercise Science – 50

1 Summa Cum Laude
7 Magna Cum Laude
3 Cum Laude

B.S. in Kinesiology: Movement and Sports Studies – 23

2 Summa Cum Laude
5 Magna Cum Laude
5 Cum Laude

B.S. in Kinesiology: Sports Administration – 17

2 Magna Cum Laude

Ed.D. in Allied Health Education and Administration – 1

M.Ed. in Allied Health Education and Administration – 3

M.Ed. in Health Education – 4

M.Ed. in Physical Education – 12

M.S. in Exercise Science - 1

Ph.D. in Kinesiology - 4

HHP Faculty 2004 - 2005

Dr. Phyllis Levenson Gingiss, Professor

Research Areas: Tobacco education, intervention program evaluation, evaluation of municipal tobacco ordinances, school health promotion

Dr. Andrew S. Jackson, Professor

Research Areas: Body Composition, Research Design, and Exercise Science Test Validation

Dr. Charles S. Layne, Professor

Research Areas: Development of coordination, investigation of locomotion/posture control, the role of somatosensory input on muscle contraction.

Dr. Dale G. Pease, Professor

Research Areas: Sport psychology – Using Reversal Theory in leadership, burnout, and EEG research.

Dr. Dennis Smith, Professor

Research Areas: Patterns of tobacco use, particularly in adolescents, evaluation of tobacco cessation programs, school and community health issues

Dr. Joel Bloom, Associate Professor

Research Areas: Biomechanics, Sports Therapy, Curriculum Development/Administration & Supervision.

Dr. Mark S.F. Clarke, Associate Professor

Research Areas: Muscle physiology, muscle adaptation to mechanical loading, cellular basis of muscle function in health and disease.

Dr. Daniel A. Martinez, Associate Professor

Research Areas: Connective tissue plasticity, collagen adaptation to altered gravitational vectors, wound healing and extracellular matrix remodeling, bioengineering of ligament and tendon.

Dr. Kim Matalon, Associate Professor

Research Interests: Nutrition, PKU response, metabolic disorders.

Dr. Demetrius Pearson, Associate Professor

Research Areas: Early and contemporary sport forms, depictions and characterizations of sport, Professional Preparation and Program Administration.

Dr. Jenny Yi, Associate Professor

Research Areas: Breast cancer education, particularly in the Asian American community, health care issues in the Asian American community.

Dr. Sharon Bode, Clinical Assistant Professor and Dietetic Internship Coordinator

Dr. Whitney Boling, Assistant Professor

Research Areas: Health promotion.

Dr. Jill. A Bush, Assistant Professor, Research Areas: Endocrine, neurohormonal,

immune, and nutrient regulation of resistance training; and exercise and nutrition interventions to reduce obesity and risk factors for chronic disease.

Dr. Faith Forman, Clinical Assistant Professor and Discover U coordinator

Dr. Rebecca E. Lee, Assistant Professor

Research Areas: Community-based prevention research focusing on environmental determinants of physical activity, dietary habits and obesity in ethnic minority populations.

Dr. Brian McFarlin, Assistant Professor

Research Areas: Chronic resistance training, aging, and cell signaling for production of pro-inflammatory cytokines. Regulators of natural killer cell activity during recovery from high-intensity endurance exercise.

Dr. Norma E. Olvera, Assistant Professor

Research Areas: Socio-cultural, psychological, and environmental influences on childhood obesity among Hispanic populations. Design, implementation, and evaluation of clinical and community obesity prevention interventions for minority populations.

Mr. Andrew Rorschach, Clinical Assistant Professor

Dr. Warren Wisenchant, Assistant Professor

Research Areas: Social justice among athletic directors, sports finance.

Publications 2004 - 2005

1. Suryawan A., P.M.J. O'Connor, S.R. Kimball, **J.A. Bush**, H.V. Nguyen, L.S. Jefferson, and T.A. Davis. Amino acids do not alter insulin-induced activation of the insulin signaling pathway in neonatal pigs. *J. Nutr.* 134(1): 24-30, 2004.
2. Ramsay, T.G., **J.A. Bush**, J.P. McMurty, M.C. Thivierge, and T.A. Davis. Peripheral leptin administration alters hormone and metabolite levels in the young pig. *Comp. Biochem. Physiol. A Mol. Integr. Physiol.* 138(1): 17-25, 2004.
3. Orellana, R.A., S.R. Kimball, H.V. Nguyen, **J.A. Bush**, A. Suryawan, M.C. Thivierge, L.S. Jefferson, and T.A. Davis. Regulation of muscle protein synthesis in neonatal pigs during prolonged endotoxemia. *Pediatr. Res.* 55(3): 442-449, 2004.
4. O'Connor P.M.J., S.R. Kimball, A. Suryawan, **J.A. Bush**, H.V. Nguyen, L.S. Jefferson, and T.A. Davis. Regulation of neonatal liver protein synthesis by insulin and amino acids in pigs. *Amer. J. Physiol.* 286(6): E994-1003, 2004.
5. Kraemer, W.J., A.M. Mastro, S.E. Gordon, L.P. Koziris, **J.A. Bush**, J.S. Volek, R.S. Staron, D.N. French, M.J. Sharman, B. Jemiolo, M.R. Deschenes, and W.C. Hymer. Responses of plasma Proenkephalin peptide F in rats following 14 days of spaceflight. *Aviat. Space Environ. Med.* 75(2): 114-117, 2004.
6. Davis T.A., **J.A. Bush**, R.C. Vann, A. Suryawan, S.R. Kimball, and D.G. Burrin. Somatotropin regulation of protein metabolism in pigs. *J. Anim. Sci.* 82(Supplemental): E207-213, 2004.

7. **Clarke, M.S.F.** Effects of exercise on skeletal muscle in the aged. *J. Musculoskeletal and Neuron Interactions*. 4: 175-178. 2004.
8. **Jackson, A.S.**, Kampert, J.B., Morrow, J.R., Church, T.S. (2005). (Response To Letter to Editor Titled Longitudinal Changes in Cardiorespiratory Fitness: Measurement Error or True Change). *Medicine and Science in Sports and Exercise*. 37:879.
9. Batterham A.M., **Jackson A.S.** Allometric cascade model and metabolic rate - Response *Respiratory Physiology & Neurobiology* 146 (1): 3-4 March 2005.
10. **Jackson, A.S.**, Kampert, J.B., Barlow, C.E., Morrow, J.R. Blair, S.N, (2004) Longitudinal changes in cardiorespiratory fitness: measurement error or true change? *Medicine and Science in Sports and Exercise*. 36:1175-1180.
11. Stanforth P.R., **Jackson A.S.**, Green J.S., et al. Generalized abdominal visceral fat prediction models for black and white adults aged 17-65 y: the HERITAGE Family Study *International Journal of Obesity* 28 (7): 925-932 July 2004.
12. Suminski R.R., Ryan N.D., Poston C.S., **Jackson, A.S.** et al. Measuring aerobic fitness of hispanic youth 10 to 12 years of age *International Journal of Sports Medicine* 25 (1): 61-67 January 2004.
13. **Jackson A.S.**, Pollock M.L. Generalized equations for predicting body density of men (Reprinted from *British Journal of Nutrition*, vol 40, pg 497, 1978) *British Journal of Nutrition* 91 (1): 161-168 January 2004. (This article first appeared in the *British Journal of Nutrition* in 1978. "It is the second most highly cited article that the BJN has published. Interrogation of the Science Citation Index indicates that this paper has received some 547 citations (as of September 2003). This figure is based, of course, only on those journals that are included in the Science Citation Index database and does not include citations in books and monographs; thus the true extent to which it has been cited is even higher." Paul Trayhum, Editor-in-Chief.) Anis, N.A.
14. A. Kyparos, D.L. Feedback, **C.S. Layne, D.A. Martinez, and M.S.F. Clarke.** Mechanical stimulation of the plantar foot surface attenuates soleus muscle atrophy induced by hindlimb unloading in rats. *J Appl Physiol* 99 (2): 739-746, 2005.
15. **Layne, C.S., Forth, K.E., Abercromby, A.F.** Spatial Factors and Muscle Spindle Input Influence the Generation of Neuromuscular Responses to Stimulation of the Human Foot. *Acta Astronautica*, 56 9-12, 809-819, 2005.
16. Anis NA, **Lee R.E.**, Ellerbeck E.F, Nazir N., Greiner K.A., Ahluwalia J.S. Direct observation of physician counseling on dietary habits and exercise : patient, physician, and office correlates. *Preventive Medicine*. 2004; 38:198-202.
17. Pulvers K.M., **Lee R.E.**, Kaur H., Mayo M.S., Fitzgibbon M.L., Jeffries S.K., Butler J., Hou Q., Ahluwalia J.S. Development of a Culturally Relevant Body Image Instrument among Urban African Americans. *Obesity Research*. 2004; 12: 1641-1651.
18. Huang T.T., Kempf A.M., Strother M.L., Li C., **Lee R.E.**, Harris K.J., Kaur H. Overweight and Components of the Metabolic Syndrome in College Students. *Diabetes Care*. 2004; 27:3000-3001.

19. **Lee R.E.**, Harris K.J., Catley D., Shostrom V., Choi S., Okuyemi K., Kaur H., Ahluwalia J.S.. Factors Associated with BMI, Weight Perceptions and Trying to Lose Weight in African American Smokers. *Journal of the National Medical Association*. 2005; 97:53-61.
20. Li C., Kaur H., Choi W.S., Huang T.T.-K., **Lee R.E.**, Ahluwalia J.S. Additive interactions of maternal prepregnancy BMI and breast-feeding on childhood overweight. *Obesity Research*. 2005; 13:362-371.
21. Collins, R., **Lee, R.E.**, Albright, C.L., King, A.C. Ready to be Physically Active? The effects of a course preparing low income multiethnic women to be more physically active. *Health Education & Behavior*. 2004; 31: 47-64.
22. Li C., Kaur H., Choi W.S., Huang T.T.-K., **Lee R.E.**, Ahluwalia J.S.. Additive interactions of maternal prepregnancy BMI and breast-feeding on childhood overweight. *Obesity Research*. 2005; 13:362-371.
23. Choy, V.E., A. Kyparos, T.C. Crenshaw, A.C. Vailas and **D.A. Martinez**. The biphasic response of porcine tendon to recombinant porcine growth hormone. *Growth Horm IGF Res* 15(1) 39-46, 2005.
24. Hilton, M.J., L. Gutierrez, **D.A. Martinez** and D.Wells. EXT1 regulates chondrocyte proliferation and differentiation during endochondral bone development. *Bone* 36(2): 379-386, 2005.
25. Gosselin, L.E. and **D.A. Martinez**. Impact of short term tumor necrosis factor- α blockade on diaphragm from dystrophic (mdx) mice. *Muscle Nerve* 30 (2): 244-246, 2004.
26. Gosselin, L.E., J. Williams, M. Deering, D. Brazeau, S. Koury, **D.A. Martinez**. Localization and early time course of TGF- β 1 mRNA expression in dystrophic muscle. *Muscle Nerve* 30 (5): 645-653, 2004.
27. **McFarlin, B.K.**, Flynn, M.G., Campbell, W.W., Stewart, L.K., & Timmerman, K.L. (2004). TLR4 cell-surface expression is lower in exercise trained older women. *Med. Sci. Sport. Exerc.* 36(11):1876-83.
28. Kim, W., Erlandsen, H., Surendran, S., Stevens, R.C., Gamez, A., **Michals-Matalon, K.**, Tying, S.K., Matalon, R. Trends in Enzyme Therapy for Phenylketonuria. *Molecular Therapy* 10: 220-224, 2004.
29. Surendran, S., Rady, P.L., Szucs, S., **Michals-Matalon, K.**, Tying S.K., Matalon, R. High level of orexin A observed in the phenylketonuria mouse brain is due to the abnormal expression of prepro-orexin. *Biochem Biophys Research Comm.* 317:522-526, 2004.
30. Matalon, R., Surendran, S., Tying, S.K., **Michals-Matalon, K.** Phenylketonuria: Genomic Interaction and the Phenotype. *EXCLI Journal* 3:39-45, 2004.
31. Zapalac, R.K. & **Pease, D.G.** Threat or challenge, *Texas Coach*, 36-39. 2004.

32. Zhang, J.J., Lam, E.T.C., Connaughton, D.P., Bennett, G., **Pease, D.G.**, Pham, U.L., Killion, L.E., Ocker, L.B., & Duley, A.R. Variables affecting spectator enjoyment of minor league hockey games. *International Journal of Sport Management*, 5, 2, 157-182. 2004.
33. Zhang, J. J., Lam, E. T. C., Connaughton, D. P., Bennett, G., & **Smith, D. W.** (2005). Development of a scale measuring spectator satisfaction toward support programs of minor league hockey games. *International Journal of Sport Management*. (In press).
34. Stevens, S.L., Colwell, B., **Smith, D.W.**, Robinson, J., & McMillan, C. (2005). An exploration of self-reported negative affect by adolescents as a reason for smoking: Implications for tobacco prevention and intervention programs. *Preventive Medicine*, 41(2), 589-596.
35. Goodway, J. & **Smith, D.W.** (2005) Foreword (Special Issue on the Health of Children). *Journal of Family and Community Health*, 28(2): 111-112.
36. Goodway, J.D. & **Smith, D.W.** (2005) Keeping All Children Healthy: Challenges to Leading an Active Lifestyle for Preschool Children Qualifying for At-Risk Programs. *Journal of Family and Community Health*, 28(2), 142-155.
37. Zhang, J. J., Lam, E. T. C., **Smith, D.W.**, & Fleming, D. S. Successful program management through quality evaluation: Development of the scale for program facilitators to assess the effectiveness of after-school achievement programs. *Measurement in Physical Education and Exercise Science*. (in press).
38. Friedman, K.E., **Smith, D.W.**, Zhang, J.J., Perry, J. & Colwell, B. (2004). Importance of tobacco cessation services at higher education institutions in Texas. *Journal of Drug Education*, 34(3), 313-325.
39. Pedersen, P., Schneider, R., & **Whisenant, W.** (2005). Analyzing the 2001-2002 sport management faculty openings. *International Journal of Sport Management*, 6(2), 1-11.
40. **Whisenant, W.**, Pedersen, P., & Smucker, M. Referent selection: How women in sport journalism shape their perceptions of job satisfaction. *Journal of Sport Management*, 18, 368-382; 2004.

Publications in Press 2004 - 2005

1. Davis, T.A., M.L. Fiorotto, A. Suryawan, P.M.J. O'Connor, and **J.A. Bush**. Developmental regulation of protein metabolism. *J Anim Sci* (in press, 2004).
2. V. Singh, Y. Desta, P. Datta, J. Guy, **M.S.F. Clarke**, D.L. Feedback, J. Weimert and J. Goettert. "A Hybrid Approach for Fabrication of Polymeric BIOMEMS Devices" *Journal of Microfabrication* (special addition, HARMST Meeting 2005) (in press).

3. Stanforth, P.R., **A.S. Jackson**, J. S. Green, J. Gagnon, T. Rankinen, J. DesprZs, C. Bouchard, A.S. Leon, D.C. Rao, J.S. Skinner & J.H. Wilmore. Generalized abdominal visceral fat prediction models for black and white adults age 17-65: The HERITAGE Family Study. *International Journal of Obesity*. Accepted for publication.
4. **Layne, C.S.**, Mulavara, A.P., McDonald, P.V., Pruett, C.J., Kozlovskaya, I.B., Bloomberg, J.J. Alterations in Human Neuromuscular Activation During Over ground Locomotion After Long-Duration Spaceflight. (*Journal of Gravitational Physiology*, in press).
5. Colwell, B., Ramirez, N., Stevens, S.L., **Smith, D.W.** & Creekmur, S. Seasonal variations in the initiation of smoking among adolescents. Nicotine and Tobacco Research (in press).

Scientific Presentations 2004 - 2005

1. **Abercromby, A.F.J., Arellano, C., Neptune, R.R., Ambrose, C.A., and Layne, C.S.** "Inverse Dynamics Gait Analysis Using Optoelectronic and Digitized Virtual Markers." The Houston Society for Engineering in Medicine and Biology, The 22nd Annual Houston Conference on Biomedical Engineering Research, February, 2005.
2. Meyers, M. and **Bloom, J.A.** "Fast Pitch Softball Injuries" Their etiology, treatment and prevention" - Paper presented at the 81st TAHPERD Convention (Texas Association for Health, Physical Education, Recreation, and Dance), Arlington, TX – December, 2004.
3. **Boerm, M., and Gingiss, P.M.** A Comparison of the Tobacco-Related Activity Levels in Texas Schools Currently Funded, Previously Funded, and Never Funded in SY2004. Presentation to the Task Force for the Texas Tobacco Control Initiative, Texas Department of Social and Health Services, August, 2004.
4. Orellana R.A., S.R. Kimball, H.V. Nguyen, **J.A. Bush**, A. Suryawan, M.C. Thivierge, W. Liu, L.S. Jefferson, and T.A. Davis. Insulin stimulated muscle protein synthesis in neonates during endotoxemia despite suppression of insulin-stimulated mTOR-dependent translations initiation. *Federation for American Societies of Experimental Biology Journal*, 18(5): A855, 2004.
5. Kennedy, T.F., **J.A. Bush, M.S.F. Clarke, C.S. Layne**, S.M. Smith, and **A.S. Jackson**. Response of bone markers and ground reaction forces to acute impact landings. *The Integrative Biology of Exercise*, APS Intersociety Meeting, Austin, TX, 2004.
6. Suryawan A., P.M.J. O'Connor, R.A. Orellana, J.V. Nguyen, **J.A. Bush**, C.W. Liu, and T.A. Davis. Tissue specificity of the protein synthetic response to insulin and amino acids in neonatal pigs. *Federation for American Societies of Experimental Biology Journal*, 18(5): A543, 2004.
7. **Bush J.A.**, T.F. Kennedy, B. Ang, **C.S. Layne**, and **M.S.F. Clarke**. Bone remodeling and ground reaction force response to three different acute jump exercise protocols. *ACSM, Med Sci. Sports Exerc.* (suppl): , 2005.

8. Bray M.S., Ellis K.J., **Bush J.A.**, Turpin I., Callie M., Miller F., and **Jackson A.S.** Race And Ethnic Effect Of Estimating DXA Percent Fat From BMI: The Tiger Study. *Med Sci Sport & Exerc.* 37(5) Supplement:S303, May 2005.
9. **Jackson A.S.**, Ellis K.J., **Bush J.A.**, Turpin I., Miller F., Callie M., and Bray M.S. Cross-validation And Calibration Of Jackson-Pollock Equations With DXA: The Tiger Study. *Med Sci Sport & Exerc.* 37(5) Supplement:S302, May 2005.
10. **Edwards L.** and **Layne, C.S.** "Active Regeneration (AR) Program for Individualized Paralyzed Due to Spinal Cord Injury." The Houston Society for Engineering in Medicine and Biology, The 22nd Annual Houston Conference on Biomedical Engineering Research, February, 2005.
11. **Everett, M.** Sigma Xi Student Research Day poster – Serum Proteomic Profile Changes Induced by Decreased Percent Body Fat. (faculty sponsor, Clarke, M.)
12. **Forth, K.E.** and **Layne, C.S.** "The Neuromuscular Response to Context-Specific Foot Stimulation" - The Houston Society for Engineering in Medicine and Biology, The 22nd Annual Houston Conference on Biomedical Engineering Research, February, 2005.
13. **Gingiss, P.M.** & **Boerm, M.** (2005). Implications of resource allocation decisions on the status of school tobacco programs. Austin, TX: Texas Department of State Health Services.
14. **Gingiss, P.M.**, Roberts-Gray, C. and Sline, R. Positioning for Success: Website Overview. Presentation to the MultiAgency Taskforce for the Texas Tobacco Control Initiative, Texas Department of Social and Health Services, August, 2004.
15. **Harrison, C.A.**, & **Pearson, D.W.** (2004, December). Power connection: A multi-faceted approach to fitness training. Texas Association for Health, Physical Education, Recreation and Dance, Arlington, TX.
16. Lee C., Sailors M.H., **Jackson A.S.**, Ellis K.J., **Bush J.A.**, Turpin I., Miller F., Callie M., and Bray M.S. Body Image And Correlation With Body Composition And Attrition Rate In The Tiger Study. *Med Sci Sport & Exerc.* 37(5) Supplement:S173-S174, May 2005.
17. **James, E.**, **Banda, J.**, and **Layne, C.S.** "The Time Course of Recovery from Whole-body Vibration Induced Postural Sway." The Houston Society for Engineering in Medicine and Biology, The 22nd Annual Houston Conference on Biomedical Engineering Research, February, 2005.
18. **Korman, S.** and **Layne, C.S.** presented "Let's Do Rhythm Gymnastics" –at TAPHERD, December, 2004.
19. **Lee R.E.**, Greiner A., Hall S., Born W., Kimmina K., Allison A. Ecologic correlates of obesity in rural obese adults. *Annals of Behavioral Medicine.* 2005; 29: S205.
20. **Lee R.E.**, Cubbin C., Ahn D., Winkleby M. Neighborhood influences on energy expenditure in women in the Stanford Five City Project. 2005. *Journal of the International Society of Behavioral Nutrition and Physical Activity.*

21. Kiernan M., Goldberg J.H., Cooper L., **Lee R.E.**, Olson S., Raymond M. Efficacy of taste - based goal setting : Results of the Stanford healthy weight project. *Annals of Behavioral Medicine*. 2005; 29:S018.
22. **Lee, R.E.** "Environmental Correlates of Leisure and Transportation Walking in African American Residents of Public Housing". Poster presented at the annual meeting of the Robert Wood Johnson Foundation Active Living Research Program. February, 2005.
23. **Lee, R.E.**, Regan, G. Reese-Smith, J., Booth, K.M., Howard, H.H. Availability of Healthful Foods in Stores in Urban Housing Development Neighborhoods. *Obesity Research*, 2004; 12: S A30.
24. **Lee, R.E.**, Harris, K.J., Catley, D., Shostrom, V., Choi, S., Mayo, M.S., Okuyemi, K., Ahluwalia, H.K., Ahluwalia, J.S., Bmi, Perceived Overweight And Trying To Lose Weight In African American Smokers. *Annals of Behavioral Medicine*, 2004; 26 S.
25. Born, W.K., Pulvers, K., **Lee, R.E.**, Greiner, K.A., Kaur, H., Nollen, N.L., Hall, S., Fitzgibbon, M., & Ahluwalia, J.S. (2004) Body Image Discrepancies in Rural Obese Patients. *Annals of Behavioral Medicine*, 2004; 26 S.
26. Okuyemi, K.S., Nollen, N., Hall, H., Rhode, P.C., **Lee, R.E.**, Greiner, K.A., Ahluwalia, J.S. Cigarette smoking, diet, and physical activity in a homeless population. *Annals of Behavioral Medicine*, 2004; 26 S.
27. **Lee, R.E.** & Rhode, P. Intrinsic and Extrinsic Motivation Associated with BMI and Weight Loss. *Proceedings of the American Psychological Association annual convention*, 2004.
28. Huang T.T., Kempf A.M., Strother M.L., Li C., **Lee R.E.**, Harris K.J., Kaur H. Overweight and Components of the Metabolic Syndrome in College Students. *Diabetes Care*. 2004; 27: 3000-3001.
29. **Lee, R.E.**, Reese-Smith, J., Regan, G., Booth, K., Sigler, J., Hodel, A., Howard, H.H., Estabrooks, P.A. Promoting walking in high and low supportive urban neighborhoods. *International Journal of Behavioral Medicine*, 2004; 11: S294.
30. Booth, K.M., **Lee, R.E.**, Regan, G.R., Reese-Smith, J., Howard, H. Type and Quality of Physical Activity Resources Available to Residents of Urban Neighborhoods. *Medicine and Science in Sports and Exercise*, 2004; 36(5 Supplement).
31. **D.A. Martinez**, R.E. Grindeland, R. Vanderby, Jr., and A.C. Vailas. Healing Response of Injured Rodent Knee Ligaments to Hindlimb Unweighting and the Therapeutic Efficacy of Growth Hormone and Insulin-like Growth Factor-I. USRA Bioastronautics Investigators' Workshop Symposium, January 10-12 Galveston, Texas, pp. 25, 2005.
32. Matalon, R., **Michals-Matalon, K.**, Koch, R., Stevens, R. Tetrahydrobiopterin in the Treatment of Phenylketonuria. The Third International Conference on Phenylketonuria. Kharkiv, Ukraine, May 2005.
33. Matalon, R. **Michals-Matalon, K.**, Nielson, J., Novikov, P, Grechanina, E. Large Neutral Amino Acids (LNAA) and Effect on Blood Phenylalanine in Phenylketonuria. The Third International Conference on Phenylketonuria. Kharkiv, Ukraine, May 2005.

34. Matalon, R., Koch, R., **Michals-Matalon, K.**, Mosley, K., Rassin, D. Grady, J., Trying, S., Dorenbaum, A. Multiple dose study of tetrahydrobiopterin (BH4) in phenylketonuria. SSIEM September 2004 Amsterdam, conference presentation.
35. **B.K. McFarlin**, M.G. Flynn, & T. Hampton. *Carbohydrate Intake during Exercise: Effect on Natural Killer Cell Response to In Vitro Stimulation*. American College of Sports Medicine, Free Communication Slide Presentation, May 2005.
36. Apolzan J.W., Flynn M.G., **McFarlin B.K.**, and Campbell W.W. Age, but not physical activity status, affects appetite in humans. *FASEB JOURNAL* 19 (5): A1496-A1496 Part 2 Suppl. S MAR 7 2005.
37. Stewart L.K., Flynn M.G., Campbell W.W., Craig B.A., Robinson J.P., **McFarlin B.K.**, Timmerman K.L., Coen P.M., Felker J., and Talbert E. Effect Of Exercise Training On Inflammatory Cytokine Production And Cell-surface Toll-like Receptor Expression. *Med Sci Sport & Exerc.* 37(5) Supplement: S377, May 2005.
38. Coen P.M., Flynn M.G., **McFarlin B.K.**, Campbell W.W., Craig B.A., Robinson J.P., Stewart L.K., Timmerman K.L., and Felker J. The Influence Of Age, Physical Activity And 12-weeks Of Exercise Training On hs-CRP. *Med Sci Sport & Exerc.* 37(5) Supplement:S376, May 2005.
39. Navalta JW, Sedlock DA, Park KS, and **McFarlin BK**. Effects Of Gender And The Menstrual Cycle On Exercise-induced Lymphocyte Apoptosis. *Med Sci Sport & Exerc.* 37(5) Supplement:S373, May 2005.
40. **McFarlin B.K.**, Flynn M.G., and Hampton T. Carbohydrate Intake During Exercise: Effect On Natural Killer Cell Response To In Vitro Stimulation. *Med Sci Sport & Exerc.* 37(5) Supplement:S128, May 2005.
41. **Nguyen, K.T.**, and **Layne, C.S.** "Identifying Neuromuscular Inhibition in the Human Lower Leg Using Mechanical Stimulation to the Foot." The Houston Society for Engineering in Medicine and Biology, The 22nd Annual Houston Conference on Biomedical Engineering Research, February, 2005. – This poster received a runner up award in the Student Poster Competition. Only 4 of 77 posters were recognized.
42. **Olvera, N.** Sekula, B., & Linares A. (Nov 2004). Correlates of physical activity in Hispanic and non-Hispanic White children. Poster presented at the annual meeting of the North American Association for the Study of Obesity, Las Vegas, Nevada.
43. **Olvera, N.**, Suminski, R., Power, T. G. (Nov 2004). Intergenerational perceptions of body size and attractiveness in Latinos: Role of gender, acculturation, and BMI. Poster presented at the annual meeting of the American Public Health Association, Washington, DC.
44. **Olvera, N.**, Poston., C., & Rodriguez, A. (Nov 2004). Parental socialization strategies and cigarette smoking initiation in Latino Youth. Poster presented at the annual meeting of the American Public Health Association, Washington, DC.
45. **Olvera, N.**, Suminski, R., Power, T.G. Intergenerational perceptions of body size and attractiveness in Latinos: Role of gender, acculturation, and BMI. Poster presented at the annual meeting of the American Public Health Association, Washington, DC. Nov 2004.

46. **Olvera, N.**, Poston.,C., & Rodriguez, A. Parental socialization strategies and cigarette smoking initiation in Latino Youth. Poster presented at the annual meeting of the American Public Health Association, Washington, DC. Nov 2004.
47. **Pearson, D.W.** (2005). Absence of power: The lack of female leadership in contemporary sport films. *Research Quarterly for Exercise and Sport*, 76 (1), A-106-107.
48. **Pearson, D.W.** (2004, December). A qualitative analysis of the marketing mix within ethnic rodeos. Texas Association for Health, Physical Education, Recreation and Dance, Arlington, TX.
49. **Pearson, D.W.**, & **Rodriguez, A.** (2004, November). A rode less traveled: Sport film research and instructional implementation. North American Society for the Sociology of Sport, Tucson, AZ.
50. Lee, J., **Pease, D.G.**, Branum-Martin, L., & Heil, J. (July, 2005) Cognitive and affective interactions of elite female foil fencers: A Reversal Theory Approach. 12th International Reversal Theory Conference, Winnipeg, Manitoba, Canada.
51. Colwell, B., **Smith, D.W.**, .Kelly, M., & Summers, S. (May 2005). Demand for Adult Smoking Cessation Assistance in El Paso, Texas. 2005 National Conference on Tobacco or Health, Chicago, IL.
52. Zhang, J.J., Lam, E.T.C., **Smith, D.W.**, Fleming, D.S., & Connaughton, D.P. (2005). Parent evaluation of after school enrichment programs: Development of a scale. *Research Quarterly for Exercise & Sport*, 76(1) (In press).
53. Colwell, B. & **Smith, D.W.** (May 2005). Results of an Involuntary Adolescent Tobacco Awareness & Cessation Program. 2005 National Conference on Tobacco or Health, Chicago, IL.
54. Colwell, B., **Smith, D.W.**, Kelly, M. (May 2005). Shifting Regional Social Norms Following Passage of Smoke-Free Indoor Air Ordinances. 2005 National Conference on Tobacco or Health, Chicago, IL.
55. Pedersen, P., Myers, R., and **Whisenant, W.** Sport management professorial job announcements: A content analysis of employment and advertisements and openings in this emerging academic field. Paper presented at the 2005 National Association for Kinesiology and Physical Education in Higher Education (NAKPEHE) Conference, Tucson, AZ, January, 2005.
56. **Whisenant, W.** - "Managerial activities of interscholastic athletic administrators". Paper presented at the 81st TAPPERD Convention (Texas Association for Health, Physical Education, Recreation, and Dance), Arlington, TX – December, 2004.
57. **Whisenant, W.** & Pedersen, P. - "The importance of an AD's commitment to fairness: Justice and its impact on athlete retention and job satisfaction of coaches." Paper presented at the 6th Annual Florida State University Sport Management Conference, Tallahassee, FL. October, 2004.

Books and Chapters 2004 - 2005

1. **Bush, J.A., Ph.D.** and Travis Triplett-McBride, Ph.D. The adrenal medulla preproenkephalins and exercise stress, chapter 16, Endocrinology of Physical Exercise and Sport, in The Encyclopedia of Sports Medicine, Blackwell Science, 2005.
2. **Clarke, M.S.F.** and Feedback, D.L., "Compact, Automated Centrifugal Slide-Staining System" NASA Tech Briefs, 2004.
3. **Clarke, M.S.F.** and Vanderburg, C.R. (2004). Impact-mediated loading of large macromolecules into adherent mammalian cells *In. Cell Biology: A Laboratory Handbook*. ed. J.E. Celis (3rd Edition), Academic Press. (*in press*).
4. Feedback, D.L. and **Clarke, M.S.F.** (2004) Space flight induced changes in muscle structure and function. *In Space Physiology and Medicine* ed. A.E. Nicogossian, S.L. Pool & C.L. Huntoon (4th Edition) Lippincott, Williams and Wilkins (*in press*).
5. **Clarke, M.S.F.**, Jones, J.A. and Feedback, D.L. (2004) Syringe Loading: a method for assessing plasma membrane function as a reflection of the mechanically-induced membrane wound response. In. **Cell Biology: A Laboratory Handbook**. ed. J.E. Celis (3rd Edition), Academic Press. (*in press*).
6. Zhang, J.J., **Pease, D.G.**, **Smith, D.W.**, Wall, K.A., Saffici, C.L., Pennington-Gray, L., Connaughton, D.P. (2004). Spectator satisfaction with the support program of professional basketball games. In B. Pitts (Ed.), Sharing Best Practices in Sport Marketing: Emerging Sport Marketing Research for the New Millennium (pp. 23-45). Morgantown, WV: Fitness Information Technology.
7. **Pease, D.G.** (2004). Psychologic factors of rehabilitation. In J.R. Andrews & G.L. Harrelson (Eds.), Physical Rehabilitation of the Injured Athlete (3rd ed., pp 1-15). Philadelphia: W.B.Saunders Co.

Federal Funding 2004 - 2005

1. **Clarke, M.S.F.**, Development and Characterization of a Three-Dimensional Tissue Culture Model of Bone, NASA-Johnson Space Center Research Grant Program, (2004-2006) (Total Amount - \$95,000).
2. Bray, M., Deanna Hoelscher, D. **Jackson, A.**, **Bush, J.A.**, Consultants: John Foreyt, Ken Ellis, Darrell Neuffer, Robert Ferrell, Rob Ross, NIH-NIDDK, 3/2003-3/2008, Awarded \$3,175,520.00, IDC (UT): Yr1 \$159,876; IDC (UH): Yr1 \$55,229.
3. **Layne, C.S.**, Developmental Evaluation of a Dynamic Foot Stimulation Device. National Aeronautics and Space Administration (NASA) - January, 2004, \$59,592 (direct costs) - contract modification - April, 2004, \$20,000 added to contract.

4. **Lee, R.E.**, Maintaining Physical Activity in Ethnic Minority Women, 5/2005-4/2010, National Institutes of Health (NIDDK), Direct Costs: \$2,473,869.00, Indirect Costs: \$800,895.00.
5. **Lee, R.E.**, Mechanisms of Physical Activity Behavior Change, 7/2004 - 6/2009 National Institutes of Health (NIDDK), Direct Costs: \$21,180.00, Indirect Costs: \$10,272.00.
6. **Matalon K.** "Response of Phenylketonuria to Tetrahydrobiopterin", funded by the FDA Orphan Products Development - subcontract with UTMB, \$168,767 total for 3 years, start date, May, 2005.

Non-Federal Funding 2004 - 2005

1. **Clarke, M.S.F.**, Subtractive Proteomic Profiling of Control, Atrophied and Protected Rat Skeletal Muscle by Dynamic Foot Stimulation (DFS). The Institute for Space Systems Operations, University of Houston/NASA-JSC (2004-2007) (Total Amount - \$120,000).
2. **Gingiss, P.M.** (PI). Texas Department of Social and Health Services, Research and Evaluation of the Texas Tobacco Prevention and Control Initiative. - funded \$274,586 (FY05).
3. **Layne, C.S.**, Development of the Office of Scientific Data Review and Dissemination, Wyle Laboratories Inc., Life Sciences, Systems, and Services - (funded, April, 2004 - \$-1,733,952.64 - 3.5 years) (full 48.5% indirect costs).
4. **Lee, R.E.**, Environmental Correlates of Leisure and Transportation Walking of Residents of Public Housing.1/2005-12/2007, Robert Wood Johnson Foundation Active Living Research, Direct Costs: \$275,230.00, Indirect Costs: \$24,770.00.

Internal Funding 2004 - 2005

1. **Bode, S., Rorschach, A., Sharma, S.** were awarded an FDIP grant "Human Nutrition and Foods Electronic Materials" – funded \$25,000, May, 2005.
2. **Bush, J.A.**, Detecting exercise-induced changes in muscle blood flow dynamics in healthy, at risk, and diabetic adults using near-infrared spectroscopy.1/2005-12/2005, University of Houston, Awarded \$4,000.00. Faculty Research Opportunity Award.
1. **Bush, J.A.**, The effect of ground reaction forces on markers of bone metabolism in young adults. 2/2003-2/2004, University of Houston, Awarded \$1,750.00.Faculty Research Opportunity Award.

3. **Bush, J.A.**, Near-infrared spectroscopy assessment of muscle vascular function at rest and during exercise in type 2 diabetic adults of Hispanic descent. 2/2003-2/2004, University of Houston, Awarded \$6,000.00. Faculty Research Opportunity Award.
4. **Clarke, M.S.F.**, Subtractive Proteomic Profiling of Control, Atrophied and Protected Rat Skeletal Muscle by Dynamic Foot Stimulation (DFS). The Institute for Space Systems Operations, University of Houston/NASA-JSC (2004-2007) (Total Amount - \$120,000).
2. Barbieri, E., **Layne, C.S.**, Hagan, D., Pre/Post-Flight Neuromuscular Control with Variable Resistance/Assistance Exercise Machines. Institute for Space Systems Operations, University of Houston. (2004–2006, \$120,000 over 3 years for a post-doctoral fellow to work at UH and NASA).
3. **Layne, C.S.**, Using Dynamic Foot Pressure as a Countermeasure to Muscle Atrophy, National Aeronautics and Space Administration (NASA) and ISSO/University of Houston, 6/1/01-5/31/04 \$120,000 (3 years support).
4. **Layne, C.S.**, Correlation of Patterns of Gait and Implant Wear after Total Hip Replacement. Faculty Research Opportunity Award – COE – funded, December, 2004, \$4000.
5. **Lee, R.E.**, Social Cohesion Strategy to Promote Sustainable Weight Loss in Overweight Ethnic Minority Women, 9/2005-8/2006, University of Houston Grant to Enhance and Advance Research (GEAR) , Direct Costs: \$25,495.
6. **Lee, R.E.**, A Social Cohesion Strategy to Increase Walking in Ethnic Minority Women, University of Houston, College of Education, Faculty Opportunity Research Award, 1/2005-12/2005, Direct Costs: \$3,902.39.
7. **Martinez, D.A.** "The efficacy of growth hormone delivery via adenovirus mediated transgene delivery in the rat medial collateral ligament wound healing model." Submitted: \$29,200 - UH Grants to Enhance and Advance Research (**GEAR**) Program January, 2005.
8. **McFarlin, B.K.**, The Effects of Exercise and Carbohydrate Consumption on T-cell Cytokines and Natural Killer Cell Activity: Implications for Innate Immunity. Funded by The University of Houston. Fall 2004. \$6,000.00.
9. **McFarlin, B.K.**, The Effect of Knowledge of Drink on the Physical Response to Exercise and Immunity. Funded by the College of Education – FROA. Fall 2004. \$4,000.00.
10. **Olvera, N.** "BOUNCE: Behavior Opportunity Uniting Nutrition, Counseling, and Exercise." - \$30,000 - UH Grants to Enhance and Advance Research (**GEAR**) Program January, 2005.
11. **Olvera, N.**, Boxi-Baila and Dance Fitness Program for Hispanic Girls. College of Education, Faculty Research Opportunity Award, (\$3,100), Jan 2005-Dec.2005.
12. **Pearson, D.W.**, Educational Technology and University Outreach, University of Houston. Grant support for the integration of multimedia into Power Point presentations for instructional purposes. Awarded: July 15, 2005. Award Amount: \$1600.00.

13. **Pearson, D.W.**, African American Studies Faculty Development Program, University of Houston. "Black in the Saddle: Narratives of the Most Revered Shadow Rider of the Subterranean Circuit." Awarded: June 22, 2005. Award Amount: \$1275.00.
14. **Pearson, D.W.**, Faculty Special Request Program, University of Houston. Funding support solicited to present research paper at American Alliance for Health, Physical Education, Recreation and Dance national convention. Awarded: March 23, 2005. Award Amount: \$493.00.

United States Patents 2004 - 2005

Clarke, M.S.F. Spatial localization of dispersed single walled carbon nanotubes into useful structures. US Patent # 6,896,864 (Granted May 24, 2005).

Clarke, M.S.F. and Feedback, D.L. Production of stable aqueous dispersions of carbon nanotubes. US Patent # 6,878,361 (Granted April 12, 2005).

Completed Ph.D. Dissertations 2004 - 2005

Forth, Katharine, The Neuromuscular Responses to Context-specific Foot Stimulation, Chair, Dr. Layne 2005. **USRA Post-Doctoral Fellow, NASA-Johnson Space Center, Houston, TX**

Hughes, Daniel, Physical Activity and Stress in Hispanic Breast Cancer Survivors, Chair, Dr. Pease, 2004. **Post-Doctoral Fellow, MD Anderson Cancer Center, Houston, TX.**

Zapalac, Ryan, Construction and Validation of the Metamotivational Sport Identification Scale (MSIS), Chair, Dr. Pease, 2004. **Faculty, Rice University, Houston, TX.**

Jevas, Stephanie, Burnout in Texas Division 4A and 5A High School, Athletic Trainers from a Reversal Theory Perspective, Chair, Dr. Pease, 2004. **Faculty, East Carolina University, Greenville, N.C.**

Faculty Kudos

Bloom J.A. Named to the Leadership Team of the Get Lean Houston organization.

Bloom, J.A. Chosen to work as part of a research team on a \$53,000 grant in HISD and Spring Branch to include cycling in the wellness curricula. Dr. Bloom's UH's role is to instruct the teachers to lead the classes, supervise the instruction and be involved in data collection.

Bode, S. Dietetic Internship had a total of 105 applicants from 55 Universities in 29 states--all time high application rate.

Boling W. The Caregiver Quality of Life Cystic Fibrosis (CQOLCF) Scale. Invited inclusion in the On-Line Guide to Quality-of-Life Assessment.

Boling, W. Involved in the inclusion of our departmental webpage on the Alzheimer's Caregiver site.

Bush, J.A., Bloom, J.A., McFarlin, B., Martinez, D.A., Layne, C.S., Clarke, M.S.F., Olvera, N., and Lee, R.E. Presented at Department of Health and Human Performance's First Annual Research Day February 15, 2005.

Bush, J.A. Co-organizer of Health and Fitness Seminar Series that is co-sponsored by Tiger Study of Dept of Health and Human Performance and Dept of Campus Recreation.

Bush, J.A. Seminar Title: "Get off the Treadmill: Strength Training as an Alternative Strategy for Physical Fitness". Health and Fitness Seminar Series, March 11, 2005.

Bush, J.A. Seminar Title: "Healthy Heart and Exercise as You Age", Houston Retired Teachers Organization, March 11, 2005.

Bush J.A. Selected to serve as a Review Panel Specialist, US Air Force Medical Support Agency (AFMSA), November 8-9, 2004.

Foreman, F. Received the Texas Association of Community Service and Continuing Education (TACSCE) Award of Excellence for a four year institution. October, 2004.

Gingiss, P.M. Review Panel Member: National Institutes of Health: Small Business Innovation Research Grant Program. Alcohol, Tobacco and Substance Abuse Study Section. Washington, D.C., February 24, 2005.

Gingiss, P.M. Review Panel Member: National Institutes of Health: Small Business Innovation Research Grant Program. Risk Prevention and Health Behavior Study Section. Washington, D.C., February 25, 2005.

Gingiss, P.M. Appointment: Adjunct Professor, Curtin University, College of Public Health and Technology, Perth, Western Australia (2004-2007).

Layne, C.S. Named to the Advisory Board of National Center for Human Performance being developed under the direction of the Texas Medical Center.

Layne, C.S. Elected treasurer of the UH chapter of the Sigma Xi Research Society – 2004-2005.

Lee, R.E. Accepted a position on Mayor Bill White's Wellness Council.

Lee, R.E. Served as an Ad Hoc Grant Reviewer for the Community Level Health Promotion Studies National Institutes of Health Study Section (February, 2005).

Lee, R.E. Served as an Ad Hoc Grant Reviewer for the Robert Wood Johnson Foundation Active Living Research Program, Round 4, Case Studies, January, 2005.

Lee, R.E. Received the Research Excellence Award from the University of Houston College of Education on August 15, 2005 for previous and current work in research.

Lee, R.E. Served as an Ad Hoc Grant Reviewer for the Center for the Disease Control (CDC) and Prevention Research Center (PRC): Special Interest Project(SIPS) Competitive Supplement in Cardiovascular Diseases: (July 2005).

Lee, R.E. Served as an Ad Hoc Grant Reviewer for the National Institute of Health Roadmap Interdisciplinary Research Working Group R13 NIH application: (July, 2005).

Martinez, D.A. Participated as an NIH Study Section Member for: Special Emphasis Panel/Scientific Review Group 2005/10 ZRG1 F10 (29) (L) - meeting on 07/18/2005, Washington D.C.

Pearson, D. Appointed Chair for the Nominations Committee for the VP-elect for College Division of TAHPERD.

Pearson, D. Attended the Youth Job Forum - Sports & Entertainment Careers: Beyond the Lights – September, 2004.

Pearson, D. Received the Outstanding Faculty Award, University of Houston Alumni Organization, - October, 2004.

Pease, D. Re-certified as a Sport Psychology Consultant by the Association for the Advancement of Applied Sport Psychology, and continues to serve on the United States Olympic Committee Sport Psychology Registry.

Whisenant, W. Graduate Research Seminar in Sport Management - Dr. Cunningham, Texas A&M University, February, 2005.

Rorschach, A. Hosted the semi-annual Houston Area PKU Association workshop in the Cameron on February 9, 2005.

Rorschach, A. Served as a reviewer of the textbook Nutritional Science: An Integrated Approach.

Publicity

Bloom, J. Quoted in the *Houston Chronicle* on February 26, 2005 regarding safe running practices.

Bush, J.A. Featured in a KHOU news story concerning the use of steroids by young. Wednesday, May 18, 2005.

Bush J.A. and D. Bertman - *The Daily Cougar*, Volume 70, Issue 36, Tuesday, October 12, 2004 - Marching band gets physical: UH program keeps musicians, cheer squad, dance team fit.

Bush, J.A., Boling, W., Sharma, S., Layne, C.S., Clarke, M.S.F., Bertman, D. – The partnership between the UH Spirit of Houston Marching Band and the Quality of Life, Activity, and Diet Assessment Program (QUAD) was the subject of a UH press release and featured on the UH Breaking News scroll bar – September 1, 2004.

Foreman, F. Discover U program was featured in a recent U.S. Chamber of Commerce CD featuring successful community, business and educational partnerships.

HHP's new **DEXA machine** featured in *Exercise Daily* online magazine.

Lee, R.E. Featured in the University of Houston's "Applause" on August 9, 2004 for acceptance of position on Mayor Bill White's Wellness Council.

Lee, R.E. Featured in the *Houston Chronicle* on December 7, 2004 for her previous research in Kansas City about access to healthy foods in poor inner-city neighborhoods.

Lee, R. E. Featured in the *Houston Chronicle* on January 30, 2005 in article about recommendations for governments to help people eat healthier.

Lee, R.E. Featured on the front page of *The Daily Cougar* on March 22, 2005 regarding her being named to the Mayor's "Wellness Council".

Lee, R.E. Featured in the *Houston Chronicle's* column "Faces in the Crowd" on April 28, 2005 for her research on the effect of lifestyle choices on health.

Lee, R.E. Featured in the University of Houston *Collegium*: The Magazine of the University of Houston in the spring 2005 publication. "Healing our Neighborhoods: Healthy Neighborhoods" featured her previous research in Kansas City about how neighborhood elements influence behavioral choices.

Lee, R.E. Featured in *Diabetic Microvascular Complications Today* Journal January/February 2005 for appearance at North American Association for the Study of Obesity 2004 Annual Scientific Meeting held November 14 to 18, 2004. Presentation covered was about limited access to quality fruits and vegetables in some urban areas which was conducted in Kansas City neighborhoods.

Lee, R.E. Featured in *RUMBO*, a website for Spanish speakers on May 18, 2005 in an article that correlated streets without lighting to be a major cause of obesity.

Lee, R.E. Featured in *Houston Style Magazine* in June 23rd-29th publication in an article that highlighted Dr Lee receiving NIH award of \$3 million grant for a study on obesity at the University of Houston.

Olvera, N. Bounce Lite program featured in the *Houston Chronicle*, June 28th, 2005.

Olvera, N. BOUNCE program featured in a UH News release, February 28, 2005.

Olvera, N. Featured by the UH Women's Resource Center.

Olvera, N. Featured in *RUMBO*.

Student Kudos

Abercromby, A.F.J. National Space Biomedical Research Institute - Special Funding Request, submitted: \$23,000, January, 2005. (**Dr. Layne** serves as his mentor).

Abercromby, A.F.J. National Space Biomedical Research Institute - Summer Internship Program. Summer, 2005. (**Dr. Layne** serves as his mentor).

Arellano, C. "Development of Spaceflight Related University Curriculum." Application to the Texas Space Grant Consortium Graduate Student Research Fellowship, submitted: \$25,000, February, 2005, (**Dr. Layne** serves as his mentor).

Avolevan, V. and **Mosley, D.** Accepted at MD Anderson Cancer Center to work on a physical activity intervention with breast-cancer survivors under the supervision of Dr. Karen Basen-Engquist.

Bishop, A., Lozano, M., Brannon, E., Scott, F., Lopez, B., James, D., Kueht, M., Jones, R., Tong, W., Budget, R. Attended the Texas Chapter of the American College of Sports Medicine Conference in Dallas, March 4-5.

Boone, O. and **L. Spikes** Hired by Coca-Cola in their Minute Maid division as interns to work on research, development, and marketing on nutritional products.

Dadjoo, N. Awarded a research fellowship by the UH Undergraduate Scholar's Program. (**Dr. McFarlin** will serve as her mentor).

Everett, M., Abercromby, A.F.J., James, E., Edwards, L., Perkins, H., and Banda, J. Presented at Department of Health and Human Performance's First Annual Research Day February 15, 2005.

Gonzalez, J. Texas Dietetic Association Foundation Scholarship.

Haran, F.J. National Space Biomedical Research Institute Graduate Student Research Fellow, NASA-Johnson Space Center, Summer 2005.

Haran, F.J. Gatorade Sports Science Institute, Haran (PI), Bush (Co-PI and Sponsor). Submitted 7/2005, Gatorade Sports Science Institute Student Grant Award, "Effects of carbohydrate-protein beverage on recovery of muscle damage caused by high-intensity resistive eccentric exercise", award submitted \$3500.

Haran, F.J. "Motor response variability: A countermeasure to postflight locomotor dysfunction" - Application to the Texas Space Grant Consortium Graduate Student Research Fellowship, submitted: \$25,000, February, 2005, (**Dr. Layne** serves as his mentor).

Haran, F.J. "Motor response variability during postflight overground locomotion." National Space Biomedical Research Institute Graduate Research Fellowship Program, submitted: \$28,000, February, 2005, (**Dr. Layne** serves as his mentor).

Harrison, C.A and her "Power Connection" fitness program were the subjects of a feature story by the Houston Chronicle, December 12, 2004. (Dr. Pearson is her mentor).

Hughes, D., Zapalac, R., Jervas, S., Culpepper, D., and Perkins, H. Presented for the Tina Garrison Tennis Foundation.

Lee, S.M.C. Received the 2003 Wyle Life Sciences Distinguished Service Award.

McMahon, M. NSCA, McMahon (PI), Bush (Co-PI and sponsor). Submitted 3/2005 National Strength and Conditioning Association Graduate Student Research Award "The effect of jump training on bone mineral density in pre-adolescent children". University of Houston, New Caney Independent School District. Submitted \$2500.

McMahon, M. Gatorade Sports Science Institute, Bush (Co-PI and Sponsor). Submitted 7/2005, Gatorade Sports Science Institute Student Grant Award “Hormonal and bone mineral density response to long-term plyometric training in prepubescent children”. Submitted \$3500.

McMahon, M. “The Effect of Jump Training on Bone Mineral Density in Pre-Adolescent Children” National Strength and Conditioning Association – Graduate Students Research Award – submitted: \$2500, February, 2005 (**Dr. Bush** serves as his mentor).

Nagel, J. Accepted to UTMB Physician Assistant program.

Nguyen, K. Received a runner up award in the Student Poster Competition at the 22nd Annual Houston Society for Engineering in Medicine and Biology Conference.

Perez, J. Accepted to Texas Tech School of Pharmacy.

Wheeler, J., Powell, E., Zaffos, L., and Alanis, M. Participated in the Annual MS 150 to raise money for the National MS Society.

Wilson, P. Accepted to the LEAH (Leadership Education in Adolescent Health fellowship) with BCM/TCH.

HHP Research Laboratories

LABORATORY OF INTEGRATED PHYSIOLOGY (LIP)

The newly formed Laboratory of Integrated Physiology (LIP) in the Department of Health and Human Performance is a fully equipped human performance/physiology/biochemistry laboratory capable of performing a wide variety of human performance testing, including exercise testing, muscle strength assessment, motor co-ordination/motor performance testing, learning/memory assessment and biochemical analysis of biological samples. The LIP is made up of three interconnected areas, a biochemical analysis laboratory (1400 sq. feet), a physiological/motor control testing laboratory (2400 sq. feet) and an exercise/strength-testing laboratory with attached seminar/teaching area (2100 sq. feet). The LIP has a separate minor surgical procedure room (140 sq. feet) attached to the biochemical analysis laboratory that houses three phlebotomy stations and one minor surgical bed/station.

Specific equipment available in the LIP for research purposes include a wide range of modern technologies and equipment that allows an integrated approach to research aimed at understanding all facets of human performance.

The LIP's physiology lab testing equipment includes a Biodex Isokinetic strength testing system, maximal isometric force strength testing systems (Jackson Evaluation System), a NIRS muscle blood flow analysis system, a Myotonometer, cycle-ergometers, an expired gas analyzer, a Metabolic Gas Analyzer Cart and EKG System, instrumented treadmills, omni-directional accelerometer-physical activity monitors, blood pressure/heart rate monitors, body composition analysis equipment (hydrostatic underwater weighing tank, skin-fold calipers) and height/weight scales. The LIP's strength and conditioning lab contains resistance training equipment that will evaluate muscle strength and endurance while performing single-joint and multi-joint exercises and concentric, eccentric, and isometric muscle actions.

The LIP's motor control lab testing equipment includes an OptiTrack motion analysis system, a video-based motion analysis system, force plates, Therapeutic Electronics surface EMG system, DELSYS EMG collection system (surface and needle electrodes), a vibration platform, electrogoniometers, a dynamic foot pressure system, Gaitrite gait analysis system (instrumented ramp/walkway), and a variety of traditional motor learning technologies (RT devices, mirror tracers, etc.)

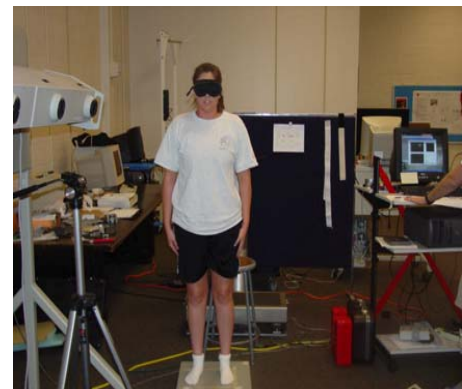
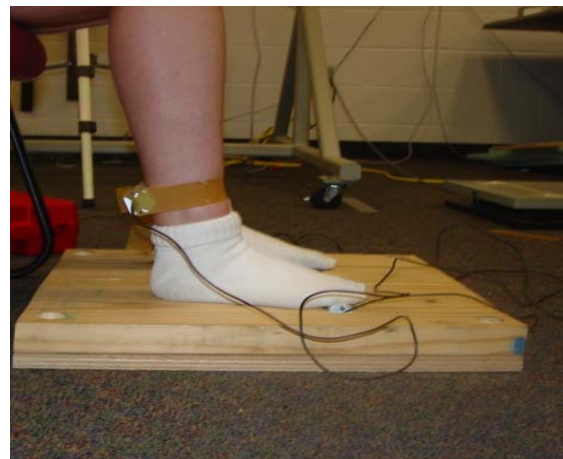
The LIP's biochemical analysis lab is equipped with a blood glucose analyzer, a blood lactate analyzer, a BioScanner 2000 blood analysis system, a blood hematocrit centrifuge, a Hemoglobin Analyzer, a Spectramax 220 tunable laser UV/VIS 96-well plate reader, a Spectramax Gemini tunable laser 96-well fluorescent plate reader.

Additionally the Biochemical Analysis lab possesses the state-of-the-art infrastructure required to support a modern biochemistry laboratory including a MilliQ water supply system, a NanoPure Water Purification System, a SpeedVac centrifugal sample concentrator, a refrigerated high speed micro-centrifuge, a refrigerated bench-top centrifuge, two -80oC freezers for sample storage, three refrigerators for reagent storage and a Thermolyne muffle furnace for dry ashing of samples.

Ongoing Projects in the Lip

After-effects of Mechanical Vibration of the Plantar Sole and Ankle Musculature on Postural Control and Body Sway

Previous research has demonstrated that exposure to vibration on the Achilles tendon results in increased bipedal postural sway, even after the vibration is removed. (Wierzbicka, Gilhodes, & Roll, 1998). Some subjects were reported to experience disrupted postural control for up to 3 hours but most recovered to baseline within 20 minutes following Achilles vibration. Vibration is known to preferential influence the firing rates of muscle spindle Ia afferents. Thus, the proprioceptive aftereffect of vibration on postural control likely involves modulation of Ia spindle input of the ankle musculature. The purpose of current study is to determine if vibration of the soles of the feet result in a similar aftereffect to that observed following Achilles's vibration and if the duration of stimulation is correlated with postural recovery time. In the study the length of the vibration duration will be the independent variable and postural control measured by changes in center of pressure (COP) will be the dependent variable. The study will consist of four separate collection periods on different days, in which the individuals will acts as their own controls: d1 = 1 min, d2 = 5 min, d3 = 10 minutes, and d4 = 20 minutes. Thirty-two individual between the ages 18-35, with normal neurological functioning, will be recruited to serve as subjects. Subjects will be assigned

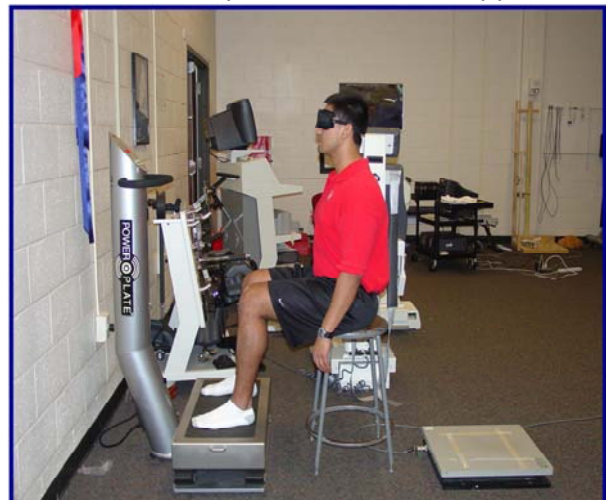
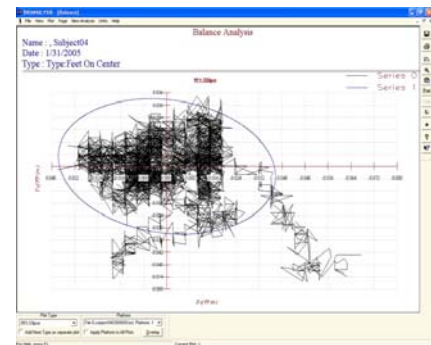


to either a group receiving vibration to their plantar soles or their Achilles tendon. Immediately after each vibration period the subjects will stand on the force plate with a spotter next to them and data will be collected for one minute. The subjects will then sit back down and retested every five minutes until they fallback within the baseline 95% area, to ensure that there is full recovery.

Effect of Vibration Plate Use on Bipedal Postural Control

The use of vibration plates to increase lower limb strength is becoming increasingly popular. The nature of vibration plates stimulates all cutaneous and proprioceptive receptors. It is known that small, locally delivered (ex. Achilles tendon) vibration preferentially stimulates the muscle spindle Ia afferents leading to bipedal postural sway. Additionally, it has been demonstrated that exposure to local vibration also produces an “aftereffect” that manifests itself in the form of increased postural sway, despite removal of the vibratory stimulus. Scientists can gain insight into motor control mechanisms by study how the system responds when sensory input is altered. Vibration plate stimulation appears to provide a strong sensory stimulus that may result in an “aftereffect”. Studying the properties of the postural aftereffect may provide additional information regarding how the sensory-motor system responds to powerful sensory influences. The purpose of this study is to determine if exposure to a vibration plate results in increased postural sway and if the length of exposure to the plate impacts the recovery of postural control.

Two groups of subjects experienced the vibration stimulus using a vibration plate (2 mm amplitude, 30 Hz). One group stood on the plate while the other group was seated with their feet resting on the plate. Each subject experienced vibration for periods of 1, 5, and 10 minutes on different days. A control of 10 minutes standing with no vibration was also performed to assess the possible impact of fatigue on postural control. Subjects were blindfolded during both vibration stimulation and force plate trials. Data was collected on the force plate for five 30s trials before vibration stimulation and ten 30s trials after vibration stimulation with 30s rest between trials. Measures of the 95% ellipse area, average velocity, and length were obtained from the force plate to compare pre vs. post vibration.



Active Regeneration (AR) Program for Individuals Paralyzed due to Spinal Cord Injury

Historically it was presumed that an individual who sustains a spinal cord injury (SCI) will within one year attain their

maximum function, beyond which further achievements in function will not occur. It has been suggested that sparing of neurons exists below the level of injury in some individuals who sustain a complete (no motor or sensory function below the level of injury) SCI (Dimitrijevic MR., 1997). This suggests that when a spinal cord injured individual attempts to move a limb the spared neural fibers below the level of injury that have the potential to be activity in some manner. Thus the possibility exists that active physical training protocol may provide benefits to spinal cord injured individuals. The purpose this study was to examine the possible effects on several physiological and neurophysiological measures of employing progressive dynamic weight bearing (PDWB) during voluntary trunk and/or upper limb activity. Four individuals with SCIs served as subjects. Electromyographic (EMG) recordings using surface electrodes (silver-silver chloride pre-amplified electrodes) were taken at baseline, 4 weeks, 8 weeks and 12 weeks. While in a seated position within the PDWB device, subjects were asked to attempt to stand upon hearing “go” and were asked to relax upon hearing “relax”. Markers were used to record the first 3 seconds of EMG data upon each attempt of standing. Subjects were then raised to an upright position. Once in the upright position a standing baseline measure was taken whereby subjects were asked to relax as best they could. In this upright position subjects were asked to attempt to stand during which EMG was recorded. Preliminary data suggests that all subjects experienced changes in EMG amplitude measures across a variety of muscles. Some subject’s displayed less activity relative to baseline following 12 weeks of training, while other displayed greater activity in specific muscles after training. Heart rate remained fairly stable with training but all subjects experienced changes in blood pressure over the 12 weeks. The data suggests that SCI individuals can experience benefits from a physical training regimen, particularly one that incorporates progressive dynamic weight bearing.



Identifying Neuromuscular Inhibition in the Human Lower Leg Using Mechanical Stimulation to the Foot

Application of sensation to the plantar sole or cutaneous afferents has been used for prevention-rehabilitation purposes. Interventions during rehabilitation include varying the load on a paraplegic person during gait (Dietz, 1998; Dietz & Duysens, 2000) as well as application of cutaneous stimulation to spastic patients to aid in artificial restoration of modulatory mechanisms of the gait cycle (Fung & Barbeau, 1994). Cutaneous stimulation appears to facilitate movement for incomplete spinal injured chicks (Muir & Steeves, 1995). Enhancing foot sensation at the plantar soles of the elderly aided in postural stabilization which may decrease the likelihood of possibly fatal trips or falls (Maki, Perry, Norrie, & McIlroy, 1999). Astronauts exposed to microgravity have also been shown to have an increased neuromuscular response in the leg muscles during an arm-raise task with plantar sole stimulation when compared to the same task without stimulation (Layne et al., 1998). This increase in neuromuscular activity implicates possible use of plantar sole stimulation for countermeasures that attenuate muscular atrophy in the microgravity environment. However, prior to full scale development of a countermeasure to neuromuscular degradation can be undertaken, a greater understanding of the human neuromuscular response to mechanical foot stimulation is needed. Specifically, it needs to be determined if particular spatial or temporal patterns of stimulation result in neuromuscular response inhibition rather than activation. The purpose of this study was to identify neuromuscular inhibition in

the human lower leg. An Inter-stimulus Interval (ISI) paradigm utilized mechanical stimulation at the plantar soles to elicit inhibitory mechanisms. Using surface electromyography (EMG), the subsequent neuromuscular responses were observed in the tibialis anterior, lateral gastrocnemius, and soleus. The main findings suggest attenuation of inhibitory mechanisms at 300ms or greater, and inhibition of neuromuscular responses were observed between 100ms to 220ms beyond the first stimulus. Previous studies suggest the observed inhibitory response is due to presynaptic inhibition. Future studies should focus on further characterizing the neuromuscular response during the inhibitory period, identifying the origins of the response, and functional significance of the inhibitory period. Information from this research is relevant to identifying optimal application techniques of sensory stimulation in rehabilitative setting as well as countermeasures utilized in spaceflight.

Effect of Plyometric Training on Bone Mineral Density Changes in Pre-adolescents

Dr. Jill Bush and Mark McMahon, CSCS, ATC, a MS candidate at University of Houston, are researching the changes in bone mineral density following six months of plyometric training in sixth-graders in a Texas school district. Weight-bearing exercise programs have been linked to higher bone density in childhood and after the second decade of life, when the majority of the skeletal muscle mass has developed. It is well-established that high impact activities in adults such as jumping causes healthy stress on the leg bones causing a breakdown of the bone tissue that is rebuilt stronger than before. The measurement of bone mineral density can provide important information on the response of bone to activities that require high bone strength such as running or jumping. An elevated rate of bone breakdown is the primary cause of bone loss with age, resulting in decreased bone amount and strength. Peak bone mass is reached by the age of 30, if not earlier. This makes it critical for children and young adults to attain the highest level of bone mass. Adolescents have shown to have the largest gains in bone mineral density, with hormonal changes due to puberty contributing to the increased bone formation. Involving pre-adolescent (before puberty) participants will ensure that increases seen in bone mineral density are due to the increase in the high intensity exercise and not from increased in the hormonal profile associated with the onset of puberty. However, there is very limited information regarding changes in bone mineral density from performing long-duration high-impact jump activities in pre-adolescent children. Therefore, the primary purpose of this proposed research study is to examine the changes in bone mineral density at two separate anatomical locations of the upper leg and hip area and lower arm and wrist area before and after a 6-month jump training exercise protocol in young pre-adolescent children. A secondary purpose of the study is to examine the changes in ground reaction forces (lower body strength) before and after a 6-month jump exercise training protocol. This research will lead to the incorporation of better physical education programming in the local school districts to increase bone mineral density in this young-aged population. The study utilizes the new dual-energy x-ray absorptiometry (DEXA) machine to measure the bone mineral density in the schoolchildren. The study performs pre- and post-testing in the Quality of Life, Activity, and Dietary Testing Center (QUAD).

Analysis of Overall Muscle Health using Near-Infrared Spectroscopy in Healthy, at-risk for Diabetes, and Diabetic Populations

Dr. Jill Bush, Dr. Mark Clarke and Jen Davis, a Master of Science student at the University of Houston, are researching the changes in overall muscle health during and following a 15-minute stationary cycle exercise. Overall muscle health is measured through the use of

near-infrared spectroscopy (NIRS). Type 2 diabetes and at-risk for type 2 diabetes, an ever-increasing prevalence in the Hispanic population, is a condition characterized by impaired endothelial-dependent vasodilation in response to reactive hyperemia such as that resulting from exercise (Caballero et al., Diabetes 1999). Impaired lower limb blood flow may lead to further complications such as attenuated wound healing. Altering body composition, maintaining cardiovascular fitness, improving glucose tolerance (Ivy Sports Med 1997), and improving endothelial-dependent vasodilation (Wang et al. Circ Res 1993; Colberg et al. JDC 2002) are positive benefits of exercise in a type 2 diabetic population. Near-infrared spectroscopy (NIRS) is a non-invasive technique that evaluates the level of *in vivo* skeletal muscle oxygenation and by extension the level of vascular perfusion, by analyzing the differential absorptive properties of hemoglobin. Validation studies of NIRS have proven a close relationship with venous oxygen saturation (Mancini et al. JAP 1994). Exercise studies show that NIRS is an appropriate tool for obtaining information about local muscle oxygenation and hyperemia (Van Beekvelt et al. JAP 2001; Sako et al., JAP 2001; Wariar et al. JAP 2000). The aim of this project is to utilize a NIRS device to estimate the capacity of the muscle to vasodilate as a consequence of submaximal cycle exercise in type 2 diabetic population of Hispanic decent. Adults subjects of Hispanic (n=15) and Caucasian (n=15) descendant will be recruited from the Houston area. They will age-matched and randomly assigned to 1 of 3 groups (10 subjects/group): healthy, at-risk for type 2 diabetes, and clinically presenting type 2 diabetes. Subjects will be considered untrained as not currently participating in any standardized exercise program for a period of 6 months. Demographic data collection (age, height, weight, body composition) and cycle VO₂ max testing; and submaximal cycle exercise protocol. Following standard procedures, a cycle ergometry test for prediction of VO₂ max will be performed for subsequent performance of a 12-min submaximal cycle exercise test at 70% VO₂ max with heart rate and blood pressure monitoring every 2 min and every 1 min into a 5-min recovery period. An optical device in the NIRS will be allowed to assimilate to its surroundings 1h prior to any exercise. The NIRS device will be attached to the tibialis anterior muscle of the dominant leg, located ¼ of the distance inferior to the patella from the lateral malleolus. Continuous monitoring at 760 nm (deoxyhemoglobin) and 850 nm (oxyhemoglobin) will be performed throughout rest, exercise, and recovery periods. The NIRS device is based on measuring differential absorbance properties of oxyhemoglobin and deoxyhemoglobin. Measuring the difference in muscle absorbency at 760 nm and 850 nm will estimate an overall tissue oxygenation. The sum absorbance values at the two wavelengths will estimate the total blood volume associated with the tibialis anterior. The use of the NIRS device will allow researchers to detect changes in vasodilation in type 2 diabetic individuals and better predict the changes in overall muscle health following exercise training.

Seasonal Performance in Collegiate Softball Players

Dr. Jill Bush and Dale Jones, CSCS, MS, a former graduate student at University of Houston, examines if the strength and power levels during the pre-season were maintained during the in-season of collegiate-level softball, when the number of days per week devoted to strength and conditioning were reduced, and to determine if there was a relationship between strength and power levels and assessment of sport-specific performance parameters during the season. For many years, strength and conditioning professionals and researchers have examined resistance training exercises and programs that are believed to benefit and improve athletic performance. Resistance training has become a popular venue for the preparation of sport-specific performance, enhancement of everyday fitness, and prevention of injury in both men and women (Hass et al., 2000). In 1990, the National Strength and Conditioning Association (NSCA) position on resistance training for female

athletes stated that resistance training could be as beneficial for female athletic performance as it can be to male athletic performance. In most NCAA Division I sport programs, training to improve speed and strength is a required part of the female athlete's participation in their selected sport (Duff et al., 1999). However, differing results were found between strength changes and sport-specific performance in numerous research studies regarding the fitness level of subject participating in the study, exercises performed that are related to sport-specific performance, resistance exercise modality, speed of execution of exercise, order of exercise, and exercise intensity and/or frequency of resistance training workouts for the various musculature studied (Baechle & Earle, 2000). The majority of research has included subjects from a diverse number of sports activities, including athletes engaging in endurance-type sports (i.e., cross-country runners, cross-country skiers, midfielders in soccer, and cyclists) and anaerobic-type sports (i.e., baseball, football, basketball, volleyball, Olympic lifters, and sprinters). The previous research on the design of resistance training programs have primarily been conducted utilizing subjects from male-dominated sport activities, ignoring any potential gender differences that might exist in the athletic performance of female participation in female-dominated sports, such as softball (fast-pitch) (McLaughlin, 2001). The studies that have assessed softball athletes have focused predominantly on pitching techniques or have compared softball to studies on baseball. Unfortunately, there has been limited research focusing only on softball. Researchers have focused much attention on the male subject, assuming that the information obtained in gender-similar sports would cross over between genders (Szymanski & Fredrick; 1999).

NCAA Division I female athletes (N=18, ages 18-21 years) from the University of Houston Varsity Softball Team participated in this study. These athletes are representative of typical college-level softball athletes regarding the skill level, physique, and age. Phase one (T1) baseline testing was completed just prior to the start of the in-season. Phase two (T2) was performed one month after the start of the in-season. Phase 3 (T3) was performed during mid-season at two months after the start of the in-season. Phase 4 (T4) was performed at the end of the regular in-season schedule. To determine the fitness level of the subjects, strength and conditioning tests were performed at T1, T3, and T4. Softball game statistics were analyzed at T2, T3, and T4. Statistics performed included repeated measures analysis of variance to test for differences between the means. Preliminary results obtained from this research indicated a significant loss in upper and lower body strength levels during the in-season. This loss in general strength did not correlate with any in-season sport-specific performance parameters measured. This indicates that although the athletes lost a significant amount of overall strength, this loss in strength did not significantly affect their ability to successfully perform sport-specific skills during the in-season. However the sport-specific measures of batting average and slugging percentage showed a steady trend towards a decreased level of performance during the course of the season. The final results indicate that decreased body strength did not have an effect on base running and pro-agility performance, supporting the paradigm that increased performance of sport-specific skills practice is more important than strength and conditioning training during the in-season as long as an adequate strength base was acquired during the off-season. However, there was a significant increase in vertical and broad jumping measures throughout the in-season. These jumping measures were highly correlated with the ability to improve base running speed. Thus, one avenue to improve sport-specific skills in softball might be to incorporate a more comprehensive plyometric training regimen into a pre-existing strength and conditioning program. These types of intervention studies will be examined in the future in Dr. Bush's research.

Effect of Jumping Exercise on Metabolic Properties of Bone

Dr. Jill Bush, Dr. Mark Clarke, and Tom Kennedy, MS graduate student at University of Houston, researched the change in metabolic properties of bone following three weeks of jump exercises with increasing resistance per week. Bone is continually undergoing a process of bone remodeling. This includes a degradation process of bone resorption mediated by the action of bone osteoclasts and a building process of bone formation mediated by the action of bone osteoblasts. This process is important and necessary for proper development and maintenance of the skeletal system. Any abnormalities in either osteoclast-mediated or osteoblast-mediated action will alter the profile of the skeletal system (i.e., bone density and shape). The measurement of specific degradation and formation products of the bone matrix can provide important information on the response of bone metabolism to bone-loading types of activity. An elevated rate of bone resorption is the primary cause of age-related bone loss, resulting in osteopenia and potential osteoporotic conditions. An alteration in the delicate balance between bone formation and bone resorption has been shown to occur in research studies involving bed-rest, space flight, and bone-loading activities. The Shuttle 2000 exercise unit (to be described below) allows for the development of force production specifically from the lower limbs. This apparatus allows an individual to perform horizontal jumping activities, while secured on the horizontal sled, with the added advantage of targeting the exercise to the lower limbs as well as performing the exercise in a safe and controlled fashion. This equipment has been used extensively in rehabilitation of lower limb injuries. With the addition of a force plate to the footplate portion of the sled apparatus, we are specifically able to measure ground reaction forces produced by the horizontal jumping motion. The Shuttle 2000 apparatus is designed on the principle of elastic recoil produced by a series of rubber bands attached to the mobile sled unit. By adding an increasing number of bands to the mobile unit, a greater amount of resistance to the activity is generated. The mechanism to produce ground reaction forces is proportional to an individual's ability to generate force. The purpose of this research is to alter the metabolic properties of the skeletal system to improve the capacity of bone formation and reduce the capacity of bone resorption through exercise performed on a uniquely-redesigned jumping apparatus. This study will also serve to validate and quantify the proportional nature of the relationship between the number of bands employed to produce the elastic recoil with production of ground reaction forces in the lower limbs of the subject. While increases in the tension (i.e., number of tension cords) produced increased ground reaction forces, the impact landing of the jumps produced no significant change in the concentration of bone markers pre- to post-exercise and produced no significant directional pattern (i.e., increase or decrease) from low to moderate to high tension. Furthermore, the concentrations of bone markers were not related to the increase in ground reaction force produced during the three different exercise protocols. There was no supporting evidence in the literature to either confirm or negate the results of this current study on the effect of acute high-impact jump landing on markers of bone metabolism with increasing ground reaction force. In the future, we will be examining these properties in older adults and those individuals on hormone replacement therapy.



Effect of Knowledge of Drink Type during Exercise on Immunity

Drs. McFarlin and Bush are performing a research study to determine if knowledge of drink

influences physical effort and immunity during recovery from high-intensity endurance exercise. High-intensity endurance exercise (1-h at 80% of max effort) has been reported to suppress the immune system for up to 24-h after recovery from exercise, during which time an individual may be more likely to get sick. The decline in immunity following exercise is directly proportional to the physical stress associated with exercise. Carbohydrate consumption has been suggested as a means to lower the degree of physical stress associated with exercise; however, consumption of carbohydrate does not consistently translate to an improvement in immunity. In a recent study, we hypothesized that knowledge of drink (i.e. subject not blinded to treatment) may influence an individual's exercise capacity and immunity. To our knowledge, no published reports have examined the influence of knowledge of drink on physical response to exercise and immunity in the same group of subjects. Twenty healthy young (18-30- years) male and female runners (>30 miles per week) will be recruited from local running clubs. They will perform a peak oxygen consumption test to determine their fitness level as well as to calculate an 80% intensity level for the experimental protocol. Subjects will complete two conditions in a random, counter-balanced order separated by 30 days: 60 minutes of aerobic exercise at 80% VO₂peak with a carbohydrate beverage and 60 minutes of aerobic exercise at 80% VO₂peak with a placebo beverage. Venipuncture blood samples will be taken to examine total white blood cell counts, natural killer cell activity, and whole blood stimulated cytokine production.

Effect of Exercise and Carbohydrate Consumption on T-cell Cytokines and Natural Killer Cell Activity

Drs. McFarlin and Bush are examining the nature of the potential regulatory interaction between T and NK cells. Strenuous, endurance exercise causes transient changes in the indices of immunity, including suppression of cellular innate immunity that may persist for up to 72-h after exercise (3, 6). This period of innate immune suppression/susceptibility has been referred to as the "Open Window", during which an individual may be more likely to get sick (5, 7). T and Natural killer (NK) cells are a part of the innate immune system, thus the activity of these cells can be used as an index of innate immunity (8, 9). T and NK cells response to exercise has been well documented (1-4); however, the exact mechanism for this response is not fully understood. In a recent study, we speculated that T-cells may regulate NK cells (2), but the design did not allow us to fully evaluate this relationship. We hypothesize that an exercise-induced decrease in T-cell activity (TCA) may partially explain decreased NK cell activity (NKCA). The primary purpose of this study is to determine if exercise alters the regulatory relationship between T and NK cells.

The Anti-inflammatory Effects of Aerobic Exercise: Comparison of Tissue Specific and Whole Body Response and the Resultant Effect on Protein Synthesis Rates in Mice

Drs. McFarlin and Bush will examine the effect of 6-weeks of aerobic exercise training in mice on inflammatory cytokine concentration, mRNA expression, and protein synthesis (repair) rates in skeletal muscle, heart, liver, and blood. Chronic inflammation is related to the development of diseases of physical inactivity and an impairment of the body's repair mechanisms. Exercise training has recently been suggested as a potential treatment for chronic inflammation because of the "anti-inflammatory" properties that it may possess. One technique to assess chronic inflammation is to examine inflammatory cytokine concentration. Recent evidence has led us to hypothesize that exercise training may exert

tissue specific differences with respect to the reduction of inflammatory cytokine concentration (ELISA) and mRNA expression (Quantative Real-time PCR). Our previous research has not examined tested this hypothesis because it is not possible to examine multiple tissue compartments in human subjects. Pathogen free Balb/cByj mice that are 3-5 weeks of age will be divided into an exercise (N=21) or control group (N=21) following a 10 day acclimation period to the housing facilities. The mice in the exercise group will run on a specialized mouse treadmill four days per week for six weeks. Upon euthanization, tissues of heart, vastus lateralis, and liver will be collected for analysis of inflammatory mRNA and protein content. This research will contribute to the designing exercise interventions and future studies for improving morbidity/mortality rates and combating chronic inflammation through exercise and reducing the dependency on pharmaceutical influences for reducing inflammation. A University of Houston Grant to Enhance and Advance Research (GEAR) grant supports this study.

Development of New Technologies for Assessing the Effects of Physical Activity on Skeletal Muscle Function and Physical Fitness in Field-Based Situations

The evidence linking reduced physical activity levels to a wide range of health problems such as obesity and its co-morbidities (e.g. cardiovascular disease, adult onset Type II diabetes mellitus and osteoarthritis) continues to mount. In addition, the protective effects of physical activity as they relate to the incidence and severity of musculoskeletal diseases, such as osteoporosis and risk of fracture, in the ever increasing number of aging individuals in the US is also well documented. Furthermore, these data also suggest that the incidence of obesity and its co-morbidities are more prevalent in urban populations and in specific ethnic groups (e.g. Hispanics and African-Americans) indicating a need for increased effort in combating such problems in these at-risk populations. Body composition measurements (i.e. caliper testing) as an estimation of (%) lean body mass (i.e. skeletal muscle tissue) are simple, reliable and easily performed on a wide range of individuals, including the elderly, the young and at-risk populations. However, they give no indication of skeletal muscle function as it relates to overall physical fitness. As such, development of technologies that can be used to provide simple, easy and reliable measures of skeletal muscle function as it relates to overall physical fitness in both general and at-risk populations is highly desirable. The purpose of this study was to develop and validate three technologies for measuring skeletal muscle function (i.e. measurement of maximal isometric strength using a modified horizontal leg extension device, measurement of muscle tone as related to tissue stiffness assessed by myotonometry and gait/stride relationships assessed using a mobile instrumented walkway) as it relates to assessing overall physical fitness in an at-risk population. These technologies are suitable for field deployment and hence provide distinct advantages (e.g. simplicity and cost) over more traditional laboratory-based techniques. These technologies have been validated in overweight/obese Hispanic individuals performing a defined, 30-day exercise-training/life style modification program (designed to decreased body fat and increase muscle mass) in order to monitor changes in skeletal muscle function relative to physical activity levels. Data sets are at present be analyzed to assess the suitability of these field-deployable measures for assessing muscle health and overall fitness by comparing these data with more tradiational strength and fitness measures collected temporaneously such as isokinetic leg strength and VO2max . This project was carried out by Dr. Mark Clarke with the help of Dr. Danny Hughes (a recent graduate of the Ph.D. program) and was funded by a GEAR grant from the UH.

Use of Dynamic Foot Pressure as a means of Enhancing Lower Limb Muscle Function in Elderly Individuals

This study is designed to investigate whether or not wearing of inflatable pressure boots for two, 20 min sessions a day can cause an increase in muscle health in the lower legs of elderly people. This study is based on previous research in both humans and animals that suggests that mechanical stimulation of the soles of the feet (known as dynamic foot stimulation – DFS) increases the overall health of the leg musculature. Potential benefits of this treatment include increased muscle tone, muscle strength, muscle blood flow, nervous activity and better posture/ balance during walking. This research focuses on an elderly population (older than 65 years) as many elderly individuals have impaired muscle function that causes problems for walking or balance. Muscle function/health are being assessed by a series of simple tests designed to measure muscle strength, muscle tone, muscle blood flow, muscle nervous activity and overall walking technique. All of these tests are non-invasive and are carried out painlessly during a single 1.25 hour visit to the LIP. Assessment takes place at the beginning of the study and again after a period of 10 weeks of boot wearing. The DFS boot is a commercially available inflatable boot sold as an aid to maintaining good blood circulation in the feet of air-line passengers. We supplied each subject with a set of these boots and instructions on how to operate the boot at home, each subject being asked to wear the boots for a period of 20 min, twice a day (once in the morning and once in the evening).

To date we have recruited fourteen subjects from an assisted living facility in the Houston area into the study with a total of four individuals having completed the study at this time. In all four subjects, DFS significantly increased lower limb muscle strength (as assessed by maximal isometric strength) as well as significantly enhancing overall gait efficiency as determined by a composite score known as a FAP score comprised of individual gait parameters such as stride length, stride time, etc. This project is being carried out by Dr. Mark Clarke in conjunction with Dr. Charles Layne and forms the dissertation project for one of Dr. Clarke's Ph.D. students, Mr. Alexander Hutchison.



The Effects of Dietary Lipid Supplementation on Implicit Learning

This study is designed to investigate whether or not different types of fats normally found in the diet can affect the way in which an individual performs and remembers a hand-eye co-ordination task. The study involves an individual eating a dietary supplement consisting of olive oil, olive oil containing cholesterol or olive oil containing fish oil (omega-3-fatty acid). These common dietary lipid compounds have previously been shown to change the way nerve cells produce a nerve impulse. Previous studies carried out by the Principal Investigator, Dr. Mark Clarke, have suggested that modifying neuronal membrane order using synthetic lipid compounds effect short term memory formation in animals and modify the ability of cultured nerve cells to release neurotransmitters in response to stimuli. This study investigates if ingestion of common dietary fats (also previously shown to modulate membrane order) affects the performance of a hand-eye co-ordination task in human subjects. In addition to this hand-eye co-ordination task, the affect of the different fat supplements on remembering the task will also be studied. This is achieved by embedding a learning and memory task within the hand-eye co-ordination task that the

individual is unaware of. This is necessary because if a person knows they are being tested for learning and memory, the effects of the dietary fats they have eaten may be masked by conscious attention to trying to remember the task. This type of hidden learning and memory task embedded in a more mundane task such as a hand-eye co-ordination task is known as “implicit” learning. To date the implicit learning has been developed using a JAVA script program that runs on any PC and has been validated with regard to its ability to detect implicit learning of the non-random portion of the task. In addition, the protocols for administering the lipid supplements and their effects on circulating levels of cholesterol, triglycerides and blood glucose have been validated. Data collection in subjects that have undergone lipid supplementation is now underway and forms the basis of a MEd thesis project. This study is being carried out by Dr. Mark Clarke and was funded by a COE Faculty Research Award.

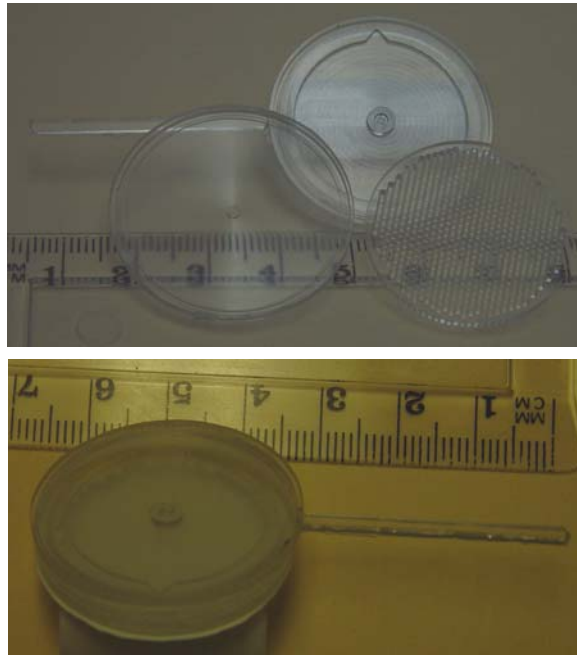
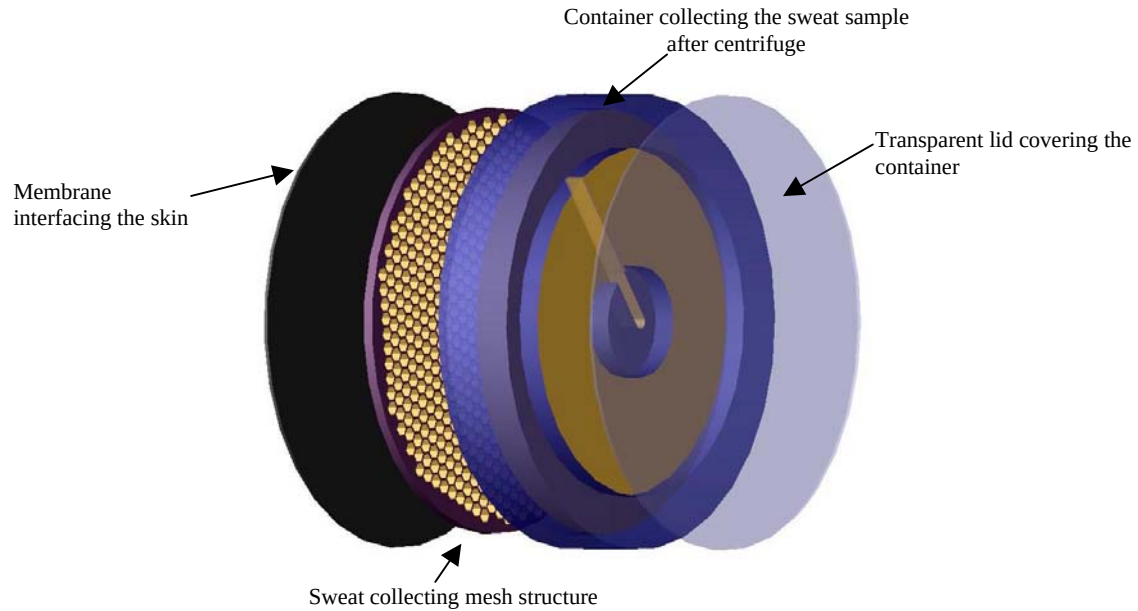
Development of a High Sensitivity Fluorescent-based Detection Immuno-Capture Assay For the Detection of Cotinine in Adolescent Smokers

While adolescents insist they are being truthful when answering questions about their smoking behavior, self reporting can be unreliable. The “chipping” smoking behavior (i.e. smoking less than one cigarette at one time, prolonged intervals between smoking incidents) of adolescents can go undetected with the current methodology for assessing smoking behavior in adults, namely measurement of serum or salivary levels of the nicotine metabolite, cotinine. Cotinine, the major metabolite of nicotine, provides a biochemical measure that correlates with the actual amount of inhaled tobacco. Cotinine levels in saliva (which exhibit a one-to-one correlation with cotinine serum levels) show a correlation with adverse health effects of smoking in adolescents as well as second hand smoke exposure. At present, salivary cotinine analysis is available with limited sensitivity and cannot reliably detect the constitutively low levels of cotinine associated with adolescent “chipping” smoking behavior. This limited sensitivity issue resides in the sensitivity of the current detection methodology, but is also impacted how the sample is collected and handled prior to analysis. This study is developing a quantitative, high sensitivity biochemical assay for the measurement of salivary cotinine in the adolescent population exhibiting the “chipping” smoking behavior. The study will also validate a salivary collection technique and device to improve salivary sample collection, ease of sample processing, sample integrity and sample recovery in order to enhance the overall sensitivity of the sample analysis. This novel biochemical validation technique uses antibody recognition of cotinine and has increased sensitivity, (minimum 5 fold increase), over existing antibody-based assays. The assay uses a stable fluorescence detection methodology rather than colorimetric detection, and has the ability to be used in a single or multiple use assay format with a dynamic range of 0.1-1000 ng/ml (Linear range 0-100) ng/ml). The focus group of this study is those adolescents with “chipping” smoking behavior that have cotinine levels ranging from 1-20 ng/ml. The collection of the sample for salivary cotinine analysis is of equal importance to the analysis. The study will also correlate and validate a new technique and device for salivary sample collection. The “lollipop” saliva collection device will be compared to the standard dental roll saliva collection or “Salivette” device. This comparison will include the ease of collection and sample processing, sample integrity, recovery and the analysis of cotinine prepared from both methods. Drs Mark Clarke and Dennis Smith from HHP are carrying this project and Dr. Brian Colwell, TAMU and forms the basis of a Master’s thesis for Ms. Karen Gunter, a PA candidate at Baylor College of Medicine.

Validation of a Microfabricated Sweat Collection Device for Monitoring Biomarkers of Bone Metabolism in Human Sweat

One of the central challenges faced in the manned space program is how to provide real time biomedical monitoring of crew members in order to assess the efficacy and efficiency of countermeasures designed to combat physical de-conditioning induced by extended space flight. This challenge is especially problematic in the case of bone loss as the underlying physiology of bone remodeling/bone loss, either during space flight or in diseases such as osteoporosis, is one that occurs over an extended period of time. The gold standard measurement for assessing bone mineral loss is dual X-ray absorptiometry (DEXA), a method that requires bulky equipment, well-trained personnel, and an assessment period that is measured in months to years. This approach, although well accepted, does not lend itself to the space flight environment or to the real time biomedical monitoring goal required to assess the efficacy or efficiency of countermeasures employed to protect astronauts during extended space flight missions. A second approach that is gaining momentum in the clinical arena is monitoring of biomarkers known to indicate the loss of bone mineral content during the earlier phases of bone remodeling/bone loss. These include measurement of excreted calcium and collagen cross-links in urine or blood, both biomarkers of bone breakdown. This approach has been successfully used to monitor patients undergoing treatment for osteoporosis in a terrestrial setting as well as being shown to reflect bone loss in individuals undergoing bed rest as a ground-based model of space flight. The goal of this project is to determine the appropriate analysis methods capable of providing the level of sensitivity required for detection of excreted calcium and collagen cross-links in human sweat as means of monitoring bone loss in crew members. As ionized calcium levels in normal human sweat are in the micro-molar levels (i.e. 50 – 250 micro-molar) as compared to the low milli-molar range for serum, pre-existing analysis techniques normally used for clinical sample analysis of calcium are inappropriate. In the case of collagen cross links in sweat, it is still unclear what the normal physiological ranges are so initial quantification will be carried out using existing techniques, such as ELISA, to determine the suitability of this approach for analysis of this biomarker in sweat. This project is designed to validate the use of such a technique based on the collection and analysis of sweat for such biomarkers. The UH Principal Investigator, Dr. Mark Clarke in conjunction with his NASA-JSC colleague, initially developed this technology at NASA-JSC. This technology is based on a micro-fabricated capillary array that is capable of collecting a known volume of sweat when worn on the skin as part of an adhesive patch. To date, this technology is capable of collecting a sample of liquid sweat up to 650 microliters in volume from both resting and exercising human volunteers under laboratory conditions. The basis of the collection method, namely capillary forces, is gravity independent. The sweat sample is then collected from the capillary array by centrifuging the sample into a collection chamber integral to the patch (see Figure 1).

Figure 1 Volumetric Sweat Collection Device (Diagrammatic Representation, Individual Components & Fully Assembled Device)



This project is funded by the Institute for Space Operations (ISSO) at University of Houston and is being carried out in collaboration with Dr. Daniel Feedback in the Medical Sciences Division at NASA-JSC.

Proteomic Analysis of Human Serum as a Means of Detecting Biomarkers of Obesity

Obesity and its associated health risks including cardiovascular disease, hypertension, and Non-Insulin Dependent Diabetes Mellitus (NIDDM) are leading causes of mortality and morbidity in the world. Identifying and characterizing changes in the proteome that occur as a result of alterations in body fat are important in understanding the physiological mechanisms associated with obesity. High-throughput proteomic profiling techniques such as surface enhanced laser desorption ionization time of flight (SELDI-TOF) mass spectrometry (MS) have been used to detect biomarkers specific to disease states such as cancer. The purpose of this investigation is to evaluate the effects of alterations in fat mass on serum protein expression in obese middle-aged individuals using SELDI-TOF MS proteomic profiling. It is hypothesized that the serum protein profile of individuals who reduce fat mass will differ to those who increase fat mass, while both conditions will be different from the fat mass stable cohort. By detecting and then identifying these protein changes, a fuller understanding of the underlying physiological mechanisms associated with the control and maintenance of body fat mass will be gained. This project is being carried out by Dr. Mark Clarke and forms the basis of both a M.Sc. thesis project and a Ph.D. dissertation project for Ms. Meghan Everett, one of Dr. Clarke's graduate students.

Use of Mechanical Foot Stimulation as a Means of Preventing Muscle Atrophy in the Hindlimb of the Unloaded Rats

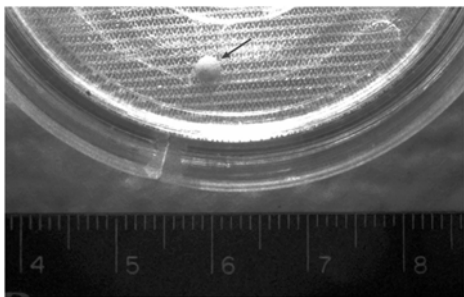
This study, recently published in the Journal of Applied Physiology, grew out of the observation that mechanical foot pressure induced muscle activation in the lower limbs of humans and the consequent possibility that such muscle activation may prevent muscle atrophy in unloaded situations. Unloading-induced muscle atrophy occurs in the aging population, bed-ridden patients and astronauts. This study was designed to determine whether or not dynamic foot stimulation (DFS) applied to the plantar surface of the rat foot can serve as a countermeasure to soleus muscle atrophy normally observed in hindlimb unloaded (HU) rats. Forty-four mature (6-month-old) male Wistar rats were randomly assigned to ambulatory control (AMB), hindlimb unloaded alone (HU), hindlimb unloaded with active DFS (i.e. plantar contact with active inflation) (HU+DFS), hindlimb unloaded with passive DFS (i.e. plantar contact without active inflation) (HU+PDFS) and hindlimb unloaded while wearing a DFS boot with no plantar contact groups. Application of active DFS during HU significantly counteracted the atrophic response by preventing approximately 85% of the reduction in Type I myofiber cross-sectional area (CSA) in the soleus while preventing approximately 57% of the reduction in Type I myofiber CSA and 43% of the reduction in Type IIA myofiber CSA of the medial gastrocnemius (MG) muscle. Wearing of a DFS boot without active inflation prevented myofiber atrophy in the soleus of HU animals in a fashion similar to that observed in HU animals that wore an actively inflated DFS boot. However, when a DFS boot without plantar surface contact was worn during HU no significant protection from HU-induced myofiber atrophy was observed. These results illustrate that the application of mechanical foot stimulation to the plantar surface of the rat foot is an effective countermeasure to muscle atrophy induced by HU. Dr. Mark Clarke carried out this study, in conjunction with Drs. Charles Layne and Daniel Martinez of HHP and Dr. Daniel Feeback of NASA-JSC. The project was funded by the Institute for Space Operations (ISSO) at University of Houston and NASA-JSC's Life Sciences Directorate as part of a Postdoctoral Fellowship for Dr. Antonios Kyparos (mentored by Dr. Clarke).

The Use Of Mechanical Foot Stimulation As A Potential Means Of Enhancing Rehabilitation Of Spinal Cord Injury Patients

There are approximately 275,000 individuals living in the United States with some degree of spinal cord injury (SCI) with approximately 10,000 more surviving a SCI each year. Many of these people experience moderate to severe disruption of motor function. The musculature below the lesion most often develops muscle fiber and motor neuron atrophy, hyperactive spinal reflexes and complete loss of voluntary activation. Following a SCI, the cord below the lesion can be thought of as a “new spinal cord”, in that the remaining neural tissue is confronted with a novel “working” environment. Fortunately, there is accumulating evidence that this new spinal cord is capable of reorganization such that some degree of learning and associated functional recovery can occur. It is becoming increasingly accepted that providing external stimuli approximating that generated as a function of normal ambulation in spinal cord injured (SCI) patients has beneficial effects on final rehabilitative outcomes. Phasic somatosensory input, particularly from the plantar surface of the feet, has been shown to be a very powerful stimulus for the promotion of spinal cord reorganization and functional recovery. Spinal cord synaptic reorganization is likely to be “driven” by activity-dependent use. Previous research has demonstrated that stimulation of the soles results in increased, context-dependent neuromuscular activity but it is only recently that we have shown this increased activity has functional utility. This project will be carried out at TIRR in a spinal cord injury patient population and is based upon the concept that activity-dependent patterns of sensory-motor system usage to the soles of the feet (i.e. DFS or vibration) will benefit the neuromuscular system and helps to promote the physiological maintenance of these systems in situations in which this stimulation is attenuated or completely lacking such as spinal cord injury. This one year TIRR-funded project will support two Ph.D. graduate students based at TIRR supervised by Dr. Mark Clarke. The ultimate goal of this approach, if successful, is to develop a laboratory within TIRR staffed by UH faculty and graduate students to carry out research in this area and to implement any successful countermeasures developed in spinal cord injured patients.

Development of A Three Dimensional Tissue Culture Model Of Human Bone.

Osteoblast/Osteoclast Co-Culture



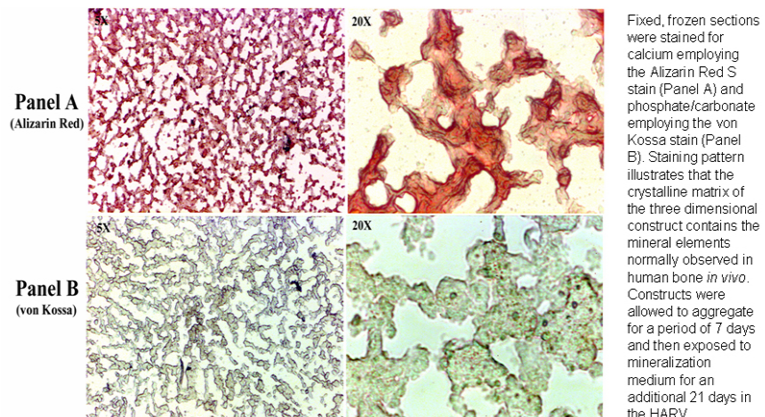
- Human Primary Osteoblast/Osteoclast 3D construct following 14 days of culture in the RVV under mineralization conditions. (Scale in cm)

This project focuses on the development and characterization of a three dimensional co-culture model system in which the effects of mechanical load (i.e. compression loading, tension, vibration, etc.) on the cellular responses of osteoblasts and osteoclasts can be investigated. The utility of this model is apparent considering the high importance placed by NASA on understanding and combating the effects of microgravity exposure and consequent unloading-induced bone loss in astronauts. The development and utilization of this model will provide novel information concerning the effects of mechanical loading/unloading on the complex cellular interactions between osteoblasts and osteoclasts that lead to both normal

bone remodeling, and more importantly from a space flight perspective, the underlying mechanisms involved in bone loss.

Development of this model will provide a unique venue for testing proposed “whole body” countermeasures to space flight-induced bone loss such as vibration, as well allowing a mechanistic approach to developing countermeasures based on modulating cell signaling at the cellular level within bone matrix. In addition, the potential terrestrial applications associated with understanding the underlying cellular mechanisms involved in osteoporosis has great potential. To date this project is being carried out by Dr. Mark Clarke in conjunction with collaborators at NASA-JSC. This project funds two graduate students that work in the Life Science Laboratories at NASA-JSC and has resulted in the filing of both a NASA and UH Disclosure of New Technology in preparation for filing a US patent on the technology.

**Histo-chemical Staining of Human Primary Osteoblast/
Osteoclast Three Dimensional Constructs for Evidence of
Mineral Deposition following 28 days of culture.**



SPORTS PSYCHOLOGY LABORATORY

The Sport Psychology Laboratory is housed in a large office size room in 131 Melcher Gymnasium. The lab is equipped with the following: audio video editing systems; VCR's and monitors to conduct stimulated recall experiences with athletes and coaches; biofeedback system; EEG data collection and analysis system; peak achievement triainer; and a large number of paper/pencil instruments used for mental performance assessment in sport and exercise.

Completed Graduate Student Research

Danny Hughes - His research investigated the relation of exercise to stress experienced by female Hispanic breast cancer survivors. Twenty five Hispanic women, all survivors of breast cancer, participated in a 10-week individualized exercise program. Stress was assessed with Cohen's Perceived Stress Scale and a measure of stress-salivary cortisol. Physical well-being and mental well-being were assessed with the SF-36 Health Survey. Pre and post measures plus additional measures were taken every two weeks during the exercise period. Significant improvements in physical fitness and mental health along with a reduction in stress on both stress measures were found. This research is currently be prepared for submission for review for publication, with the pilot work having been presented at a national conference.

Current Research Projects by Graduate Students

Heidi Perkins - She is preparing a dissertation proposal investigating the role of fear of failure in exercise adoption and maintenance. Using an achievement motivation model and instrument focused on fear of failure developed by Dr. David Convey at Penn State

University, the investigation will investigate such factors as "Fears of experiencing shame and embarrassment," "Fear of devaluing one's self-estimate," "Fear of having an uncertain future," "Fear of upsetting important others," etc. One's past history and current exercise behaviors will be assessed. It is planned that subjects will come from the corporate setting. Heidi has met with Dr. Convey and continues to communicate with him in designing the project. She has presented her pilot findings at national research meetings and has submitted an abstract for review for the AAASP conference this fall.

Dean Culpepper - Dean is preparing a dissertation proposal investigating the role of metamotivational dominances, as defined by Reversal theory (Apter, 2001), with subjects found to be experiencing mood state depression compared to non-depressed subjects. His dependent measure will be EEG activity observed at six sites while subjects observe a sensation-seeking stimulus. The application of this research is that athletes when not performing well experience mood state depression. Therefore the major question is "do people with different metamotivational dominances, as measured by the Apter Motivational Style Profile, respond differently in the cognitive processing of information due to their mood state?" Dean has presented his pilot work at two national conferences and has a submitted abstract for review for an international conference this fall.

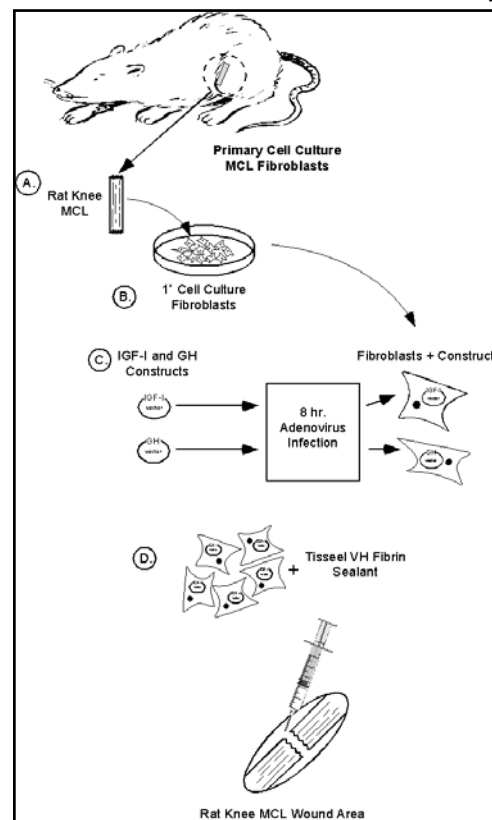
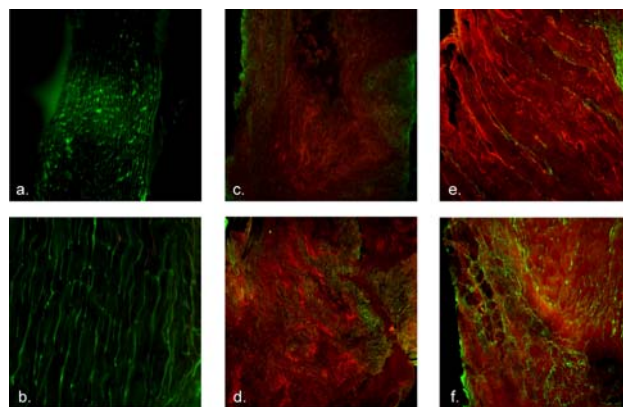
THE CONNECTIVE TISSUE LABORATORY

The Connective Tissue Laboratory is a biochemical, cell and molecular physiology laboratory investigating extracellular matrix plasticity in connective tissues at the whole animal, cellular and molecular level. We are equipped with instruments to analyze proteins, peptides and amino acids, as well as clone, express and quantitate RNA and DNA. We have a HEPA air-handled positive pressure cell culture room with cryogenic storage of cell lines. Our Laboratory has access to animal vivarium facilities located in the basement of the building for easy access to animals and for performing animal experimentation. Our laboratory includes the following instrumentation: Stratagene's MX-4000 real-time Q-PCR machine, 8 ft. Laminar flow hood, 2 CO₂ incubators, Olympus inverted microscope and upright microscope with fluorescent optics, computer video archiving system with 3CCD Sony camera, Millipore PF Ultrapure H₂O, -85 °C freezer, Superspeed centrifuge, 2 Waters HPLC systems capable of fluorescence and multi wavelength UV/Vis analysis, 2 fraction collectors, 250 °C gravity oven, 37 °C bacterial convection oven, stir plates and vortexes, 2 shaking water baths, 4 heated H₂O baths, temperature heating blocks, electrophoresis equipment (protein and DNA/RNA), 3 microfuges, 2 temperature thermocyclers, Savant Speedvac apparatus, Savant gel drying machine, Mixer Mill 300 tissue RNA Homogenizer, Buehler diamond tipped bone saw, Spex freezer mill, 96 well visible wavelength plate reader, diode array spectrophotometer, 37 °C environmental shaker, Cryo-Cell storage dewars, 8 ft chromatography cold box, Other equipment located in common use areas include: Reichert-Jung Cryocut 1800 Cryostat, walk-in 4 °C cold-rooms, autoclaves, beta and gamma scintillation counters, X-OMAT x-ray film developer, phospho-imager, French press, ultracentrifuges and a BIACORE instrument. Scanning Electron Microscopy and Atomic Force Microscopy Instruments are located in UH's Chemical Engineering Department through a collaboration with Dr. Adam Capitano.

Our research focuses on wound healing in the musculoskeletal system (ligament, tendon and bone) using rodent models (*Rattus norvegicus*) to study mechanisms of action and potential treatment therapies. Results from our studies could have beneficial clinical implications in Orthopaedic Medicine, Rehabilitative Medicine, and Geriatric Medicine specialties by trying to decrease patient's time course of wound healing and recovery to normalcy. Prior research on wound healing in ligament tissue and in the heart has been

funded by grants from the National Aeronautics and Space Administration (NASA) and American Heart Association (AHA-National).

Wound healing therapies in orthopaedics: Our musculoskeletal wound healing research has three areas of interest that are currently being pursued and will be explained independently. Initial studies have focused on what role altered ground reaction forces will have on the strength and integrity of medial collateral ligaments at the extracellular matrices cellular and molecular levels, which is of particular concern to astronauts and cosmonauts during acute and long duration space flight missions. The primary objective of the **initial phase** of knowledge base gathering on ligament tissue subjected to reduced gravitational forces using the rat hindlimb unloading apparatus (HLU) is 1) to determine if wound healing is delayed during space flight in dense fibrous connective tissues, 2) to determine if using exogenous anabolic hormones or growth factors will accelerate and improve wound healing in rat medial collateral ligament (MCL) tissues. We hypothesize that HLU will (a) diminish the ability of knee ligaments to repair a surgical transection, and (b) compromise the biomechanical and biochemical properties of the ligaments, thus producing inferior material at the site of the ligament transection, and (c) systemic exogenous GH and IGF-1 injections will, in part, restore the extracellular matrix (ECM) of the MCL to pre-surgical biomechanical and biochemical characteristics in both the healing ambulatory control and HLU animal groups. Results of our initial studies suggest that the absence of load can delay wound healing in dense fibrous connective tissues and a systemic, twice daily, supplementation of growth hormone (GH) and insulin-like growth factor-1 (IGF-1) has a beneficial effect on the overall synthesis of the extracellular matrix and aids in recouping some of the tissue strength lost due to ligament wounding. An example of the impact that GH and IGF-1 have on MCL wound healing can be viewed in **Figure 1a-1f**. Fluorescently labeled immuno-histochemical localization of collagens type I (FITC: labeled green) and collagen type III (Texas Red: labeled red) in wound transected MCL tissue from ambulatory control and HLU animals. Results after 3 weeks of **wound healing. Legend:** 1a: Normal MCL stained for Type I collagen (100x), 1b: same as 1a (200x), 1c: amb+healing+saline (no treatment, 100x) type 1 collagen is green, type III collagen is red; 1d: hindlimb unloaded+healing+saline (200x), 1e: ambulatory+healing+GH+IGF-1 (200x); 1f: HLU+healing+GH+IGF-1 (200x).



Gene Therapy and Wound Healing: The **second phase** of our research into musculoskeletal wound healing centers on the question, "What rehabilitative measures will hasten recovery of soft tissue damage in a partial Gravity environment or upon return to

Earth's gravity (1G)? Currently, we are investigating the efficacy of using GH and IGF-1 gene therapy delivered locally to the site of the wound using adenovirus mediated gene transfer and fibrin sealant at different dosages and lengths of treatment. Gene therapy using different compounds is already being used in clinics and clinical trials throughout the world. Currently, NIH (NIAMS), the Department of Defense, and NASA have an interest in accelerating wound healing in patients, troops and astronauts/cosmonauts respectively, using novel mechanisms that have potentially zero systemic side effects. A novel gene therapy for accelerated wound healing would be a patentable technology that would impact medical specialists caring for patients with long duration wound recovery times. A cartoon model of our gene therapy approach is located in the adjacent **Figure 2 (Rat Knee MCL Wound Healing Gene Therapy)**.

Laser Therapy and Wound Healing: The **third phase** of our research concerning musculoskeletal wound healing and clinical implications is the novel use of low energy lasers on healing ligament and tendon. Previously, data from our laboratory demonstrated that 5-15 watts of Ho-YAG laser treatment caused significant thermal damage to femoropatellar joint capsule, causing shrinkage of the joint, while increasing collagen fibril size. Others have shown beneficial strength effects and increases in collagen fibril diameters of LLLT on rat medial collateral ligament. We propose to use our rat medial collateral ligament model to investigate the potential of using LLLT to modulate collagen remodeling in dense fibrous connective tissue. Using a laser with "tunable" properties (power and frequency modulation), we would like to explore the biological processes of collagen modeling and remodeling following sequential bouts of LLLT. It is our hypothesis that LLLT up-regulates collagen synthesis and secretion out of proportion to collagen resorption. Studies testing this hypothesis and further identifying the underlying mechanisms of LLLT therapy on ligament and tendon wound healing are needed. Future experiments could include the activation of growth factor and/or cytokine release from surgically implanted microspheres sensitive to specific wavelengths of LLLT to aid in the wound healing process. LLLT is transferable to clinical situations where tendons and ligaments located below the surface of the dermis would be subjected to dosages of non-harmful laser treatment to accelerate wound tissue recovery times.

OBESITY PREVENTION AND URBAN FITNESS CENTER

The Obesity Prevention and Urban Fitness Center was formed in the Spring of 2004 with the purpose of conducting clinical research related to America's obesity epidemic, and developing educational programs to serve the UH student body and the demographically diverse underserved community surrounding the UH campus. Federal representative, Shelia Jackson Lee announced the formation of the center in the United States Congressional Record on May 6, 2004. (<http://hhp.uh.edu/congresrecord.htm>).

Currently, six important research programs are developing under the auspices of the center. These are the TIGER study, the QFIT program, the QUAD program, the UNDO program, the BOUNCE program and the Body Composition Facility. Below are descriptions of each program and some of the specific research projects underway within these programs.

Body Composition Facility

An important component of the Obesity Prevention and Urban Fitness Center is the recently acquired **Dual energy X-ray absorptiometry (DXA)**. Dual energy X-ray absorptiometry (DXA) was initially used for measuring bone density to assess the risk of osteoporosis.

Scientists discovered that, with the appropriate software, DXA also had the capability of measuring the body's fat weight and fat-free weight components. The DXA method has now become the gold standard for assessing body composition. With the growing incidence in obesity, particularly with minority individuals, the University of Houston has made the study of obesity a research priority. The DXA was purchased with funds provided by the UH central administration as a result of a special funding request as part of the 2004 UH budget process. We have recently received approval from the UH-Committee for the Protection of Human Subjects (CPHS) to begin collection of whole body composition data as part of an on-going longitudinal project to develop a normative whole body composition database that can be grouped using a variety of ethnographic parameters including, age, sex and ethnicity. One specific element of this project is our ongoing relationship with the City of Houston Mayor's Office and the City of Houston's Mayor's Wellness Council. UH's HHP department houses the Science Advisory Sub-Committee for the Wellness Council headed up by Dr. Rebecca Lee. A recent initiative presented to the Mayor's Office is to develop a whole body composition database specifically drawn from the City of Houston workforce that represents the ethnic diversity of the Houston area population as a means of counteracting the negative impression of Houston being the fattest city in the US in the popular press.

Understanding Neighborhood Determinants of Obesity (UNDO)

Dr. Rebecca E. Lee heads the UNDO research team that conducts community based prevention research aimed at increasing physical activity and reducing obesity in ethnic minority populations. Her work incorporates the built environment and social context as important and under-researched elements of making and sustaining healthy behavior choices. She currently has four funded projects.

Maintaining Physical Activity In Ethnic Minority Women

Maintaining Physical Activity in Ethnic Minority Women is a five year, R01 grant, funded by the National Cancer Institute of the National Institutes of Health. The goals of the project are to (1) Compare the efficacy of a social cohesion walking intervention with an educational comparison control in African American women in Houston, (2) Determine whether women in the social cohesion group who live in a high supportive of physical activity neighborhood maintain physical activity at higher levels in comparison to those who live in a low supportive neighborhood, and (3) Determine whether the social cohesion intervention and the effect of the highly supportive neighborhood is replicable in a second sample of Hispanic women in Austin. This is a collaborative project involving the University of Houston and the University of Texas at Austin.



Environmental Correlates Of Leisure And Transportation Walking In Residents Of Public Housing

Environmental Correlates of Physical Activity and Dietary Habits of Residents in Public Housing is a three year grant, funded in part by the Active Living Research program of the Robert Wood Johnson Foundation. The goal of the project is to define and document environmental correlates of physical activity, dietary habits and obesity. The project systematically assesses all public physical activity spaces (parks, schools, community centers, etc.), food sources (stores and restaurants) and pedestrian-related, street scale elements (like sidewalks, tree



coverage, etc.) in neighborhoods surrounding 14 public housing developments in Houston, TX. Next the project assesses the physical activity, dietary habits and obesity of residents. The project correlates the environmental factors with the individual behavior using hierarchical and spatial modeling techniques. The program recently has received \$3,000 in funding from internal UH sources to conduct a small longitudinal study on a sample of residents.

Social Cohesion Strategy For Weight Loss Maintenance In African American Women

This is a one-year pilot project funded through the University of Houston's competitive Grants to Enhance and Advance Research (GEAR) Program. The purpose of the proposed study is (1) to determine whether African American women are willing to participate in an 8 week, social cohesion intervention to lose weight, (2) determine whether an eight week, social cohesion intervention (SOCO) is more effective for achieving and maintaining weight loss in comparison to an educational control (CONT). Seventy overweight and obese (BMI=27-35) African American women will be randomized to either SOCO or CONT. Participants will



complete anthropometric measures of body mass index ($BMI = \text{Kg}/\text{M}^2$) along with written sociodemographic, dietary habits, physical activity, and health measures. Findings may suggest that SOCO strategies may be effective for AA women who would like to lose weight.

Mechanisms Of Physical Activity Behavior Change

Mechanisms of Physical Activity Behavior Change is a five year grant that began in August, 2004 from the National Institutes of Health (NIDDK). The goal of this project is to look at cognitive and environmental factors that influence physical activity adoption. The team is examining two kinds of intervention strategies to increase physical activity in individuals who have been referred by their physicians after a stress test. This grant is a collaborative project with Kaiser Permanente in Colorado, where Dr. Paul Estabrooks is the Principal Investigator.

Training Interventions and Genetics of Exercise Response (TIGER)

Intervention programs for obesity commonly focus on diet and exercise, with varied results among individuals. This variability in response to treatment is at least in part due to the effect of genes. While we know that genes are important in the development of obesity, how genetic effects may be altered by exercise and diet is not well known. Therefore, Dr. Molly Bray, Baylor College of Medicine and Adjunct Associate Professor at University of Houston, and Dr. Tony Jackson are principal investigators on a study to investigate how genes related to fat formation and metabolism may influence levels of body fatness, blood pressure, and blood components both at baseline, and following a 30-week exercise intervention program. Drs. Bush and McFarlin serve as co-investigators on the research project. The exercise protocol and subject assessment will be administered at UH, and the genetic analyses will be performed in collaboration with investigators at the University of Texas-Houston. The total project period is five years.

The target subject for the study is a sedentary individual who is currently enrolled at the University of Houston and has exercised less than 30 minutes per week for the previous six months and who is not actively limiting his/her caloric intake by dieting. Emphasis will be place on recruiting subjects who are overweight or obese, in an effort to focus on students who have a desire to lose weight. Through the course of the study, we plan to enroll a total of 1,536 African American, Hispanic, and non-Hispanic white subjects selected from the student population of UH. Subjects in the study will participate in a 30-week (2 semester), 3 day/week exercise training program offered as part of the college curriculum of the University of Houston. Subjects in the study will receive a baseline examination prior to beginning the 30-week exercise training protocol and will subsequently be examined at the end of the first semester and immediately after completion of the 30-week training protocol. A total of four cohorts will be studied over a 5-year period of time. Drs. Bush, McFarlin and Jackson have designed a course through the distance education program for students in the TIGER study to enroll in this 3-credit hour course that is also a class offered under the University of Houston Social Sciences Core.

The Quality of Life and Fitness Testing Program (QFIT)

The QFIT is a joint-assessment program between the Department of Health and Human Performance and the Department of Recreation. The QFIT is housed in the new Campus Recreation and Wellness Center Suite. Dr. Bush and Layne from the Department of Health and Human Performance and Dr. Anzivino from the Department of



Recreation facilitate the operation of the QFIT program. This program was designed to encourage individuals at an urban university setting to become engaged in physical activity and improve overall fitness and wellbeing. University of Houston faculty, staff, and students have access to the QFIT. This fee-based service provides clients with information on their physical fitness and motivation to change health behaviors. Personal counseling is provided to provide information on factors increase motivation for physical activity and goals for exercise to reduce body fat and risk for cardiovascular and obesity-related conditions. As part of this assessment program, both undergraduate and graduate students in the Department of Health and Human Performance are involved in collecting the necessary research data.

The Quality of Life, Activity, and Dietary Testing Center (QUAD)

The QUAD is housed in the newly designed Health and Human Performance Institute for Obesity Prevention and Urban Fitness that opened in early Fall of 2004. The University of Houston recognizes that the obesity epidemic across the nation is a growing concern and has provided funds to develop this assessment center and QUAD program. This program was designed by Dr. Bush and Dr. Sharma to encourage individuals at an urban university setting and the surrounding community to become engaged in physical activity and improve overall fitness and wellbeing. This assessment program examines a multitude of physical fitness, quality of life, and nutrition variables. Physical fitness, quality of life and nutrition status are evaluated and clients are provided with a personalized physical activity regimen in order to reduce their risk factors for cardiovascular disease, obesity, and obesity-related conditions. Such physical fitness assessments include resting heart rate and blood pressure, body composition analysis (i.e., skinfolds, hydrostatic weighing, dual-energy x-ray absorptiometry), walking and gait analysis (performed by Dr. Layne and research graduate students), lower and upper body muscular strength, fasted blood cholesterol and glucose levels, and aerobic fitness levels. Quality of life assessments include a series of questionnaires to analysis the motivation and readiness to change health and fitness behavior. Information about trends and dietary habits are collected as well. In total, this information provides the investigators with information of the best type of exercise prescription to maintain or improve cardiovascular fitness and overall health. Currently, we are performing a research study on the *The University of Houston Marching Band, Cheer Squad, and Dance Team* are part of the QUAD assessment program to assess physical fitness, motivation to exercise, and trends in eating patterns in order to improve their health behavior, fitness, and dietary habits. Marching Band members are counseled by departmental licensed dietitians, including the graduate interns in the Dietetic Internship Program in the Department of Health and Human Performance and certified fitness specialists in the Department of Health and Human Performance to provide information on interventions to reduce their risk for cardiovascular disease, obesity, and obesity-related conditions. As part of this assessment program, both undergraduate and graduate students in the Department of Health and Human Performance are involved in collecting the necessary research data. This program will expand into the underserved surrounding community in the near future. Research data is currently being collected and analyzed. The QUADs with the Spirit of Houston Marching Band partnership is supported by a \$15,000 grant from the UH band that provides research assistant support and assessment supplies.



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BOUNCE (Behavior Opportunities Uniting Nutrition, Counseling, and Exercise)

The purpose of this program directed by Dr. Norma Olvera is to increase physical activity and fruit and vegetables and consumption, decrease of saturated fat and sugar, and enhance self-esteem in Mexican American girls with maternal social support. The fifteen-week program will be offered 3 times a week after school. Mothers and girls will learn about good nutrition choices and learn to kick box and dance as part of the exercise component. The program also includes a counseling component that builds self-esteem by teaching coping skills to deal with issues of body image. We will plan to recruit 50 girls with their mothers to participate in this study from Rusk Elementary School. One doctoral and two masters level graduate students are currently involved in the design and development of the BOUNCE curriculum.

BOUNCE LITE

A two-week summer program for girls based on the BOUNCE curriculum is currently being developed to be offered during the Summer 2005. This program will be offered to 25 girls who will receive nutrition counseling, behavior modification, and an exercise program. The nutrition counseling will teach girls to learn about healthful food choices at home and at restaurants, about reading food labels, and appropriate portion sizes. The exercise program will consist of kickboxing, dance, yoga, spinning, and walking. A Doctoral student will coordinate this summer program and HHP interns will be to assist in the implementation of the program activities.

Ethnic Differences in Physical Activity and Participation in Individual and Sport Activities

Findings from this study conducted by Dr. Norma Olvera indicated that Mexican American

(MA) children perceived significantly less equipment and facilities for physical activity than NHW children. Additionally, NHW children had marginally more significant parental support for physical activity compared to MA children. Regarding preferences for physical activity, exploratory factor analysis revealed three factors: games/playing factor (climbing, outdoor play, gymnastics, chase and tag, jump rope, bicycling), work/exercise factor (indoor and outdoor chores, exercise, running), and sports factor (football, weight lifting, basketball, soccer). Bivariate correlations among the three factors were all significant, indicating that the factors were not independent of each other. Significant associations among demographic and physiologic variables were identified with the three factors. Gender and age were significantly associated with the games/playing and sports factor. For gender, females were significantly less likely to prefer activities in the sports factor, while males were significantly less likely to prefer activities in the games/playing factor. Regarding age, older subjects were significantly less likely to prefer activities in the games/playing factor. Regarding physiological variables, weight (kgs.) was associated with the game/playing factor, indicating that heavier individuals were less likely to prefer these types of activities. Additionally, BMI was negatively associated with the exercise/work factor, indicating that individuals with higher BMI were less likely to prefer activities in the exercise/work factor. These findings suggest that social and environmental support and preferences for physical activity are related to age, gender, weight and BMI.

HEALTH NETWORK FOR EVALUATION AND TRAINING SYSTEMS (HNETS)

The Health Network for Evaluation and Training Systems (HNETS) at the University of Houston provides research, evaluation, training and technical assistance to assist schools, communities and healthcare settings to meet their health goals. HNETS is based on transdisciplinary systems theories and concepts for the development, implementation, maintenance and assessment of health programs and policies. Stage--based models are used to help programs facilitate change at the community, organization, work group and individual levels. Emerging computer-based technologies are used to support these efforts." Current projects include establishment and maintenance of monitoring and tracking systems for the Texas Tobacco Prevention and Control Initiative sponsored by Texas Department of State Health Services. These systems monitor changes in the infrastructure and capacity of schools, HMOs, and communities for tobacco control, as well as the status of municipal ordinances in Texas to protect residents from second hand smoke. Related projects examine use of web-based systems to provide training, technical assistance and "real-time feedback" to school and community projects and individual physician offices. For more information, contact Dr. Phyllis Gingiss at (713) 743-9843 or explore the HNETS website at www.uh.edu/hnets.

DIETETIC INTERNSHIP

The University of Houston Dietetic Internship program is a CADE (Commission on Accreditation of Dietetic Education) accredited post-baccalaureate, supervised practice program which qualifies graduates to take the examination to become Registered Dietitians. Interns enter the full-time program (40 hours/week for 28 weeks) in January or July of each year. The program goals reflect the major points of our philosophy: quality instruction and broad-based site training which enables graduates to land meaningful professional employment in a variety of areas upon completion. The internship is administratively housed within the College of Education, Department of Health and Human Performance.

The program has a general emphasis and is made up of a two-week intensive orientation, followed by rotations of 10 weeks in clinical nutrition, 8 weeks in food service and management, and 8 weeks in community nutrition. Each emphasis area is divided into two - four week rotations for management and community or 5-week rotations in clinical nutrition. Interns are encouraged to be active participants in planning their educational program based on individual interests. These rotations, along with the assignments, projects, and weekly conferences with the internship director, allow interns to develop advanced knowledge and skills in the areas of nutrition assessment and hospital dietetics; food service management; dietary counseling in inpatient, outpatient, and public health environments; individual and group nutrition education; and numerous other skills related to nutrition and dietetics. Graduates of the program must meet 54 identifiable core competencies required by CADE.

The program looks for candidates that are able to perform independently in a fast-paced environment. Work experience, or its equivalent, is required. Work experience does not need to be in the nutrition field and can be paid or volunteer. Academic work must be recent and of high quality. The program gives preference to candidates with nutrition GPA of 3.3 and higher, science GPA of 2.5 and higher, and overall GPA of 3.0 and higher.

The University of Houston Dietetic Internship Program currently accepts at least 26 interns per year, 13 in January and 13 in July. Up to six hours of optional graduate credit is available through several graduate programs in the Department of Health and Human Performance as well as through an affiliation agreement with Texas Woman's University. Full time enrollment will provide eligibility for student health insurance and other benefits. Student loan deferments may be obtained for the duration of the internship.

Research at other Research Laboratories

ONGOING RESEARCH WITHIN THE TEXAS MEDICAL CENTER

The Texas Institute for Rehabilitation and Research (TIRR)

The Texas Institute for Rehabilitation and Research (TIRR) is regarded as a world leader in medical rehabilitation and research. The TIRR Spinal Cord Injury Program has been a Model System with funding by the U.S. Department of Education for over 30 years. The Brain Injury Research Center of TIRR is currently funded by three grants from the National Institute on Disability and Rehabilitation Research. Core Ph.D. faculty members (Drs. Clarke and Layne) have had an on-going collaborative relationship with researchers at TIRR in the areas of spinal cord injury and muscle spasticity. The most recent addition to this relationship is a one year TIRR-funded research project to Dr. Clarke beginning Sept 1st 2005 involving the use of dynamic foot pressure as a potential rehabilitative tool in spinal cord injured patients. This project involves a year long study in which a cohort of spinal cord injury patients from TIRR will participate in a rehabilitative program involving dynamic foot pressure or foot vibration as a potential means of enhancing recovery in these individuals. This project will support two full-time graduate student research assistants from the Ph.D. program as well as funding both project space at TIRR and general project costs.

The USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine

Dr. Jill Bush maintains an Adjunct Assistant Professor of Pediatric Nutrition position since 2001 at Baylor College of Medicine in The USDA/ARS Children's Nutrition Research Center. She collaborates with several research professors at Baylor College of Medicine. Dr. Bush collaborates with Dr. Teresa Davis researching glucose and amino acid regulation in the skeletal muscle and the whole body in a neonatal pig model. Dr. Bush also collaborates with Dr. Davis and Dr. Renan Orellana examining the inflammatory response of a septic condition on tissue protein synthesis and degradation in a neonate pig model. The combination of these two studies increase the knowledge of nutrient feeding, including glucose and amino acids, in the neonate as well as examining the response of nutrients in the neonate under a septic condition. Previous research collaborating with Dr. Davis and her laboratory has involved the response of the tissue protein synthetic pathways, including message and translation initiation and protein synthesis and degradation, to administration of exogenous growth hormone in a young pig model. This research leads to a greater understanding of how growth hormone regulates protein turnover in a resting condition. Dr. Bush plans to continue this line of research utilizing strength and conditioning exercise protocols that will lead to a deeper knowledge of how the increase in growth hormone during resistance exercise alters the regulation of protein turnover.

Dr. Jill Bush also collaborates with Dr. William Wong at The USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine. Drs. Bush and Wong are writing a grant proposal to be submitted that examines the different levels of stress in nurses employed in high-stress positions, such as the emergency room and intensive care units. We will be examining the health-related quality of life, current fitness levels, and types of interventions that nurses utilize to deal with stress.

Baylor College of Medicine and Texas Children's Hospital

Dr. Jill Bush, HHP-UH and Adjunct Assistant Professor at Baylor College of Medicine, Dr. Norma Olvera, University of Houston, collaborates with Dr. William Wong and Dr. Nancy Butte of The USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine and Dr. William Klish at Baylor College of Medicine. This research study entitled Pediatric Obesity Prevention Study (POPS): Student and parent food guideline satisfaction and student health-related quality of life in relation to new Texas Department of Agriculture School Nutrition Policy guidelines. The obesity epidemic in children in Texas is prolific. The Texas Department of Agriculture instituted the Texas Public School Nutrition Policy to promote a healthy dietary environment in the Texas public schools. The purpose of these studies is to determine the attitude of schoolchildren and their parents towards the new Texas Public School Nutrition Policy while determining the health-related quality of life among the schoolchildren. The primary aim is to assess how the new nutrition policy affects fourth-graders and parental satisfaction with school food choices during a 4-month period in high-density and low-density school districts. For health-related quality of life, body mass index and a pediatric quality of life will be obtained. This research data will lead to larger longitudinal studies.

Dr. Norma Olvera serves as a consultant on an on-going NIH-funded project at The USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine entitled "Prevention of Pediatric Obesity in Lower Rio Grande Valley," the Principal Investigator of which is Dr. William Wong.

UT- School of Public Health – Houston

Dr. Norma Olvera collaborates with Wendell C. Taylor, Ph.D., M.P.H., on a study to investigate physical environment and physical activity patterns by varied income levels. The purpose of this study is to assess the physical activity environment by objective, comprehensive environmental audits conducted by trained, two person teams in 30 randomly selected neighborhoods (ten randomly selected low, medium, and high income neighborhoods) in Harris County. This research project is collaboration among The University of Texas Health Science Center – School of Public Health, Baylor College of Medicine, and University of Houston.

Ongoing Research with NASA/Johnson Space Center

The Department of Health and Human Performance has had a long association with the Biomedical Research Division at NASA-Johnson Space Center. Three of the core Ph.D. faculty have, at one time or another, worked in or closely with this organization. Currently, HHP maintains strong collaborative links with the programs at NASA-Johnson Space Center. These links have been formalized with the recent signing of a **NASA Space Act Agreement** which allows bilateral transfer of funds and equipment resources between the Department and NASA-Johnson Space Center. The most prominent collaborative projects between HHP faculty and NASA-JSC researchers are those that have garnered research funding from NASA including the development of a novel neuromuscular deconditioning countermeasure known as Dynamic Foot Pressure (P.I. Charles Layne), deployment and validation of DFS in preventing neuromuscular deconditioning in a rat hindlimb suspension model of muscle atrophy (P.I. Mark Clarke), proteomic analysis of atrophic muscle (P.I. Mark Clarke), use of NIRS as a non-invasive means of assessing muscle function (Co-PI's Mark Clarke and Jill Bush), development of a novel three dimensional human bone tissue culture model (P.I. Mark Clarke) and development of a series of micro-fabricated devices for use in biomedical monitoring of crew members during space flight (P.I. Mark Clarke). In addition, these collaborations between core Ph.D. faculty and NASA-Johnson Space Center researchers have provided many opportunities for graduate students in the Ph.D. program to perform on-going research in the laboratories at NASA-Johnson Space Center, either as Summer Interns or as full-time research assistants on funded projects. At present, three Ph.D. students have served as National Space Biomedical Research Institute Summer Interns over the last four years, as well as three full-time RA's (with an additional RA position beginning Fall '05) on NASA-funded projects carried out in research laboratories at NASA-Johnson Space Center.

Garrison & Melcher Renovations

The Garrison/Melcher complex has undergone an extensive renovation and face-lift over the past two years. This process started by taking the Garrison Gym off-line and developing it into a Math Emporium. The Garrison gym is now used as a testing and help center for those needing extra assistance in their undergraduate math courses. The next phase of renovation included removal of the Garrison men's and women's locker rooms to be replaced by the new home of the Air Force ROTC program and HHP classrooms. Additionally, the old Motor Control laboratory was converted into a model student computer laboratory with 25 new computers and the latest in print and projection technology. The new computer lab has been a very positive addition to the program. The College of

Education provides full-time staffing for the lab. Next, the Garrison and Melcher classrooms were renovated in a unique art deco theme, making them some of the most memorable classrooms in any American university. All of the new and renovated classrooms include the latest technology to ensure our students have the best opportunity to learn. The wall between Garrison 201 and 203 was removed, leaving Garrison 201 as a large, multi-purpose class and conference room. Garrison 201 served as the site for the 1st Annual HHP Research Day.



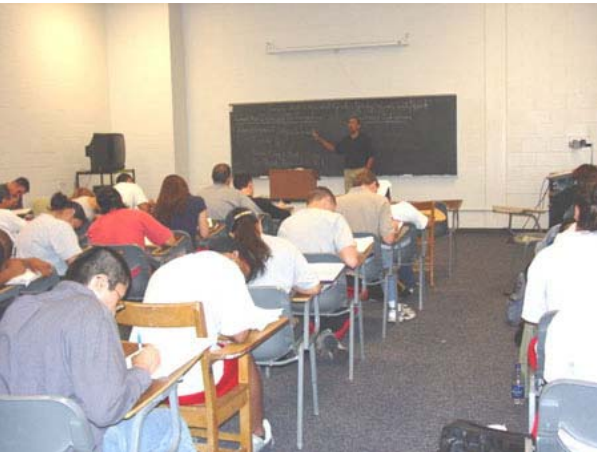
The Equipment Cage



New Classroom



New Showers



Garrison 201 now holds 100 students instead of 40



Garrison 209 Renovations



Melcher 227 Renovations

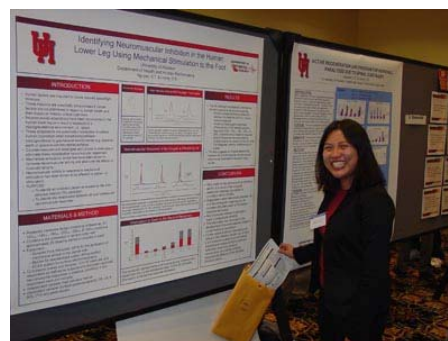
HHP Research Day

This February saw the introduction of an annual HHP Research Day. This two-day event featured both HHP professors and graduate students presenting the results of their current research projects in an effort to educate our undergraduates about the exciting scientific activities occurring in our labs and community. Our “tracking” system indicated that over 550 of our students attended at least two of the presentations. This event was an exciting beginning to what will now be an annual event. (http://www.hhp.uh.edu/Res_day1.htm)



Society for Engineering in Medicine & Biology

HHP was well represented by its graduate students at the February meeting of the Houston Society for Engineering in Medicine and Biology hosted at the UH Hilton. Six of our students presented their research at this conference that included attendees from UT Austin, UT Medical Branch at Galveston, Texas A&M, Rice, Texas Women's University, Texas Southern University, and Baylor College of Medicine. Our students did more than hold their own with Master's of Science student Kimthu Nguyen's poster receiving a runner up award in the Student Poster Competition. Ms. Nguyen's poster was one of 77 in the competition. (<http://www.hhp.uh.edu/HSEMB.htm>)



Outstanding Students & Scholarship Recipients

HHP STUDENT AWARDS

- Health Graduate – Denise Baum
- Health (Undergraduate) – Heidi Moore
- Human Nutrition and Foods - Amanda Hearn
- Kinesiology: Exercise Science - Michael Kueht
- Kinesiology: Movement and Sports Studies - Stacy Fontenot
- Kinesiology: Sports Administration - Lindy Pfingsten

SCHOLARSHIPS

- Barry C. Pelton Scholarship – Duke Berry, Jr.
- Mary Louise White Scholarship – Michael Kueht
- College of Education Alumni Scholarship – Andrew Abercromby



Tiger Seminar Series

Personnel associated with the TIGER study (Training Interventions and Genetics of Exercise Response) delivered bi-weekly seminars concerning current topics of exercise, fitness and diet. These seminars were held in the Campus Recreation and Wellness Center and were open to all faculty, students and staff. (http://hhp.uh.edu/seminar_series.html)

American College of Sports Medicine

Several HHP faculty members presented at the annual conference of the American College of Sports Medicine this May in Nashville Tennessee (<http://hhp.uh.edu/conference.htm>)



We look forward to another outstanding year in 2005-2006.