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Erik S. Hayes.
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Education

2010 Ph. D., Human Bioenergetics, Ball State University, Muncie, IN
Dissertation Title: Skeletal Muscle Health and Function in Lifelong Endurance Trained Octogenarians

1997 M.S., Athletic Training, Indiana State University, Terre Haute, IN
Research Project Title: The effect of contrast therapy on DOMS induced muscle pain and loss of function

1996 B.A., Physical Education, Asbury College, Wilmore, KY

Professional Experience

2010 - present	Assistant Professor, PHP, Taylor University, Tenure Track
2007 - 2010	Research Assistant, Human Performance Laboratory, Ball State University, Muncie, IN
2006 - present	Fit into Health Adult Fitness Program Faculty Coordinator, Taylor University, Upland, IN
1998 - 2010	Assistant Professor of PHP, Taylor University, Upland, IN
1998 - 2007	Assistant Athletic Trainer, Taylor University, Upland, IN
1997 - 1998	Assistant Professor/Assistant Athletic Trainer, Methodist College, Fayetteville, NC

Publications

Luden, N., **Hayes, E.,** Minchev, K., Louis, E., Raue, U., Conley, T., Trappe, S. **Skeletal Muscle Plasticity with Marathon Training in Novice Runners**. *Scan J of Spt Med.* April 2011

Luden, N., **Hayes, E.,** Galpin, A., Minchev, K., Jemiolo, B., Raue, U., Trappe, T., Harber, M., Bowers, T., & Trappe, S. **Myocellular Basis for Tapering in Competitive Distance Runners.** *JAP.* March 2010

Luden, N., Minchev, K., **Hayes, E.**, Louis, E., Trappe, T., Trappe, S. **Human Vastus Lateralis and Soleus Muscles Display Divergent Cellular Contractile Properties.** *Am J Physiol Regul Integr Comp Physiol*. September 2008

Abstracts/Poster Presentations

E Hayes A Galpin, T Gustafson, P Tesch[4], S Trappe. **Decreased Prevalence of Myosin Heavy Chain Hybrid Isoforms in Lifelong Endurance Trained Octogenarians**. ACSM Annual Conference, Denver, CO, June 2011

R Graydon, J Krula, R Morris, D Thrush, & **E Hayes. Combined Training Elicits Greater Strength and Equal Hypertrophic Adaptations as Equal Volume Resistance Training.** Taylor Undergraduate Research Competition, May 2011 (First Place in Category)

A Kaihoi, D Johnson, T Garrett, R Snyder, & **E Hayes. Quality of Life, Performance, and Adherence to LITE, a Resistance Exercise Program for the Elderly.** Taylor Undergraduate Research Competition, May 2011

S Trappe, **E Hayes,** A Galpin, B Jemiolo, W Fink, T Trappe, L Kaminsky, A Jannson, T Gustafsson, & P Tesch. **New Records in Aerobic Power Among Octogenarian Endurance Athletes.** Integrated Biology of Exercise, Ft. Lauderdale, FL, October 2010

Luden, N., **Hayes, E.,** Minchev, K., Louis, E., Raue, U., Conley, T., Trappe, S. **Skeletal Muscle Plasticity with Marathon Training in Novice Runners**. ACSM Annual Conference, Baltimore, MD, June 2010.

E Hayes, K Minchev, D Riley, V Vogel, M Gappa, B Kohn, D Costill, S Trappe. **Single Muscle Fiber Contractile Function of the Black Bear.** Integrated Biology of Exercise Conference V, Hilton Head, SC, September 2008.

Emily Louis, Nick Luden, **Erik Hayes**, Ulrika Raue, Bozena Jemiolo, and Scott Trappe. **Gene Expression Differs in Human Vastus Lateralis and Soleus Muscles in Response to Resistance Exercise.** Integrative Physiology Conference 2008.

Emily Louis, Nick Luden, **Erik Hayes**, Ulrika Raue, Bozena Jemiolo, and Scott Trappe. **Gender Comparison of Muscle Gene Expression in Response to Resistance Exercise,** Integrative Physiology Conference 2008.

Nicholas Luden, Kiril Minchev, **Erik Hayes**, Emily Louis, and Scott Trappe. **Human single fiber physiology differs between vastus lateralis and soleus leg muscles.** Integrative Physiology Conference 2008.

Travis Conley, Justin Crane, Jared Dickinson, Ulrika Raue, Nicholas Luden, Emily Louis, **Erik Hayes**, Bozena Jemiolo, Matt Harber, Todd Trappe and Scott Trappe. **Growth Response to Resistance Exercise: Influence of Exercise Device.** Integrative Physiology Conference 2008.

Travis Conley, Justin Crane, Jared Dickinson, Ulrika Raue, Nicholas Luden, Emily Louis, **Erik Hayes**, Bozena Jemiolo, Matt Harber, Todd Trappe and Scott Trappe. **Effect of Amino Acid Supplementation on Myogenic and Proteolytic Gene Expression Following Resistance Exercise.** Integrative Physiology Conference 2008.

Nick Luden, **Erik Hayes**, Kiril Minchev, Emily Louis, Scott Trappe. **Single Fiber Physiology Differs Between Three Human Leg Muscles.** Experimental Biology Conference 2008.

Kira Olson, Jessica Hyne, **Erik Hayes. Assessing the Need for and Feasibility of a Student Run Wellness Program.** Butler Undergraduate Research Conference, 2007.

Presentations

Exercise is Medicine, Taylor University Well Day, April 2011

Skeletal Muscle Health With Aging: Insight From the Lifelong Exerciser, Mini-research Symposium, Karolinska Institute, Stockholm, Sweden, October 2009

Muscle Physiology, Whole Body to Gene, Taylor University Chemistry Dinner, April 2009

Grant Submissions and Awards

1. $20,000 *Provost Grant Instrument Grant* - Awarded fall 2010 for the purchase of a B-mode, diagnostic ultrasound.

2. $20,000 *CR& I Seed Grant* - Submitted March 2011 in collaboration with chemistry. Partial award (~$14,500) September 2011. Under second round of review, October, 2011.

3. $5,000 Women's Giving Circle Grant - Submitted fall 2011 in collaboration with psychology and physics engineering.

4. $5,000 Provost Mini-Grant for student travel - Submitted August 2011 in collaboration with chemistry and biology. Under review.

5. $500 CT Skills Summer Mini Grant - Awarded Summer 2011

6. ~$250,000National Science Federation Instrument Grant - Submitted fall 2009 in collaboration with chemistry, biology, and the Ball State Human Performance Lab. Not funded.

Research Experience

Current

1. Reliability and Validity of B-mode panoramic ultrasound for the assessment of muscle mass and architecture.

> The primary goal of this research is to establish a reliable method to examine the cross sectional area or various muscles in a wide variety of subjects using B-mode ultrasound. Comparison to MRI may be used to determine validity. In addition, reliable methods to examine pennation angle will also be explored.

2. Mind body interaction - the interaction of meditation and/or prayer and exercise. (A collaborative project with Dr. Steve Snyder, psychology)

The primary purpose of this research is to examine the effect of intentional meditation while exercising on outcome variables such as satisfaction with life, depression, gratitude, the fruit if the spirit, markers of stress and physiological adaptations to exercise training.

Proposed

1. Assessing whole body protein turnover following various training stimuli (A collaborative project with Dr. Dan King, chemistry)

The primary purpose of this proposed research is to examine a mechanistic link between whole body and cellular markers of muscle remodeling.

Past Research Experience

1. *Skeletal Muscle Health in Lifelong Endurance Trained Octogenarians*
Principal Investigator: Erik Hayes

The primary goal of this study was to examine whole muscle and single muscle fiber function, whole muscle and cellular morphology and molecular markers of muscle regulation in a group of over 80 year old endurance trained men and compare to a group of non-endurance trained men.

2. *Physiological Adaptations to Tapered Training in Competitive Distance Runners*
Principal Investigator: S.W. Trappe
Role: Research Assistant

The primary goal of this study was to examine the effect of reduced run training at the end of a competitive running season on race performance, cardiovascular fitness, single muscle fiber contractile function, and select myogenic, proteolytic, and metabolic gene expression.

3. *Effect of marathon training on single fiber contractile physiology*
Principal Investigator: S.W. Trappe
Role: Research assistant

The primary goal of this research was to study the effects of marathon training on the contractile properties of the soleus and vastus lateralis muscles in recreationally trained individuals.

4. Muscle and gender specific gene expression at rest and with exercise
Principal Investigator: S.W. Trappe
Role: Research assistant
The major goal of this research was to examine the basal myogenic, proteolytic, and inflammatory gene levels and their response to an acute bout of exercise between the vastus lateralis and soleus muscles in males and females.

5. Growth Responses to Resistance Exercise: Influence of Device.
Principal Investigator: S.W. Trappe
Role: Research assistant

The major goal of this research was to examine the growth response following an acute bout of resistance exercise on two different exercise ergometers using multiple anabolic endpoints including gene expression, stable isotope metabolism and protein activation.

6. Standardized Fitness Testing for a College PHP Class
Principal Investigator: Erik Hayes

The major goal of this project was to develop and implement student assisted standardized fitness testing for college freshmen enrolled in a general education physical education course.

7. Feasibility of a student run adult fitness program
Principal Investigator: Erik Hayes

The major goal of this research was to determine the need for and feasibility of a student run adult fitness program for Taylor University.

8. The effect of contrast therapy on DOMS induced muscle pain and loss of function
Principal investigator: Erik Hayes (master's research)

The major goal of this investigation was to compare traditional cryotherapy with contrast therapy in their effectiveness at modulating pain and loss of muscle function induced by delayed onset muscle soreness.

Certifications

National Athletic Trainers' Association Certified; August 4, 1996- present (# 089602479)
Indiana Licensed Athletic Trainer; February 1998 - present (#36000489)
National Safety Council First Aid and CPR; 1998 - present
American Canoe Association Instructor; 2001-2006

Professional Memberships

American College of Sports Medicine; 2008 - present
American Physiological Society; 2008 - present
National Athletic Trainer's Association; 1995 - 2007
Indiana Athletic Trainer's Association; 1998 - 2009

Conferences and Professional Development
ACSM Annual Convention, Denver, CO, June 2011
Experimental Biology Conference, Washington D.C., April 2011
CTLE - Integration of faith and learning class for new faculty. Spring Semester 2011
CTLE Coaching Coffees: Preparing Syllabi, Integration of Faith and Learning, & Finishing Class Well. J-Term 2011
CTLE - Writing workshop with Dr. Bird, Fall 2010
Annual Midwest ACSM, Indianapolis, IN, October 2010*
Integrated Biology of Exercise Conference V, Hilton Head, SC, September 2008
Sports Nutrition and Exercise Workshop; Indianapolis October 2008*
Annual ACSM Conference, Indianapolis, IN, May 2008
Experimental Biology Conference, San Diego, CA, April 2008

Adult Skeletal Muscle Symposium; Indianapolis, IN, July 2007
CSCS online review course; 2006
International Academy for Eating Disorders Conference, Indianapolis, IN February 2006.*
Exercise Etc., Exercise Programs for Older Adults; Indianapolis, IN October 2005*
Diet Revolution; Home study course 2004
Strength Training for Seniors PACE workshop; Indianapolis, IN April 2004*
Foot Biomechanics Workshop; Indianapolis, IN March 2004
Low Back Injuries; Human Kinetics, Fall 2002
ACA Instructor Update; Nantahala Outdoor Center, July 16, 2003
Complementary and Alternative Medicine, Fort Wayne, IN, February 21, 2001
The 6th Annual Spts. Med. Symp. for the Health Care Professional, Cinc., OH, March 2-3, 2001
American Canoe Association Instructor Developmental Workshop, Madison, WI, May 18-20, 2001

* Denotes conferences or workshops in which I also took exercise science students