

Chris M. Gregory
Curriculum Vitae

Mailing Address:

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Department of Physical Therapy
University of Florida
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EDUCATION & TRAINING:

University of Florida

Department of Physical Therapy
Post-doctoral Fellow, 2003-2005
Mentor: Krista Vandenborne, PhD, PT

Texas Woman's University

Department of Physical Therapy
Master of Science in Physical Therapy, 2001-2003

University of Georgia

Department of Exercise Science
Doctor of Philosophy, 1998-2001
Mentor: Gary A. Dudley, PhD
Dissertation Title: Effects of testosterone replacement therapy on skeletal muscle after SCI.

University of Georgia

Department of Exercise Science
Master of Science, 1996-1998
Mentor: Gary A. Dudley, PhD
Thesis Title: Enzymes of energy supply and energy demand in human locomotor muscles.

University of Georgia

Department of Exercise Science
Bachelor of Science in Education, 1992-1996

PROFESSIONAL EXPERIENCE:

Research Assistant Professor; Department of Physical Therapy, Univ. of Florida
August 2006 - present

Associate Investigator; Brain Rehabilitation Research Center, Malcom Randall VA Medical Center May
2005 - present

Courtesy Scholar; Department of Physical Therapy, Univ. of Florida
May 2005 - August 2006

Post-doctoral Fellow; Department of Physical Therapy, Univ. of Florida
November 2003 - May 2005

Physical Therapist; Mid-Florida Physical Therapy, Ocala FL.
November 2003 - March 2006

Research Coordinator; Spine Care, P.A., Houston, TX.
November 2002 - August 2003

Post-doctoral Fellow; Department of Physical Therapy, Texas Woman's University
July 2002 - September 2003

Research Fellow; Veteran's Administration Medical Center, Houston, Texas
August 2001 - July 2002

Teaching Assistant; Department of Exercise Science, Univ. of Georgia
August 1999 - July 2001

Strength & Conditioning Coordinator; Athens Academy, Athens, GA.
June 1997 - July 2000

Research Assistant; Muscle Biology Laboratory, Department of Exercise Science, Univ. of Georgia
August 1996 - July 1999

PUBLICATIONS:

Manuscripts in Peer-reviewed Journals:

- CM Gregory**, CS Bickel, N Sharma & WE Dixon. The impact varying stimulation intensity and contraction type on the force-frequency relationship in human skeletal muscle during NMES. *Muscle & Nerve* (in review).
- CM Gregory** & CS Bickel. The use of electrical stimulation to induce hypertrophy in healthy human skeletal muscle. Invited Review: *Journal of Athletic Training* (in review).
- A Lanier, SW Stevenson, **CM Gregory**, H Wang, G Dudley & K Simpson. Exercise-induced muscle injury and influence of non-steroidal anti-inflammatory therapy on kinematics of downhill gait in older adults. *Journal of Applied Biomechanics* (in review).
- PK Shah, **CM Gregory**, JE Stevens, N Pathare, A Jayaraman, M Bowden, AL Behrman, G Walter, K Vandenborne. In-vivo assessment of skeletal muscle damage following locomotor training in persons with incomplete SCI: A brief report. *Journal of Spinal Cord Medicine* (in review).
- K Stegath, N Sharma, **CM Gregory**, and WE Dixon, Experimental demonstration of RISE-based NMES of human quadriceps muscle. *IEEE Transactions on Neural Systems & Rehabilitation Engineering* (in review).
- A Jayaraman, P Shah, **CM Gregory**, M Bowden, J Stevens, AL Behrman & K Vandenborne. Impact of locomotor training on skeletal muscle in persons after incomplete spinal cord injury. *Journal of Spinal Cord Medicine* (accepted).
- PK Shah, **CM Gregory**, JE Stevens, N Pathare, A Jayaraman, M Bowden, AL Behrman, G Walter & K Vandenborne. Non-invasive assessment of lower extremity muscle composition after incomplete spinal cord injury. *Spinal Cord*. 2008 Mar 18. [Epub ahead of print]
- YW Chen, **CM Gregory**, M Scarborough, G Walter, R Shi & K Vandenborne. Molecular responses involved in skeletal muscle atrophy after cast-immobilization. *Physiological Genomics*, 31(3): 510-20, 2007.
- SE Borst, CF Conover, CS Carter, **CM Gregory**, C Leeuwenburgh, E Marzetti, K Vandenborne & TJ Wronski. Anabolic effects of testosterone are preserved during inhibition of 5- α reductase. *American Journal of Physiology; Endocrinology and Metabolism*, 293(2): E507-14, 2007.
- CM Gregory**, W Dixon and CS Bickel. Impact of varying pulse frequency and duration on muscle torque production and fatigue. *Muscle & Nerve*, 35(4): 504-9, 2007.
- CM Gregory**, M Bowden, A Jayaraman, P Shah, A Behrman, S Kautz & K Vandenborne. Resistance training and locomotor recovery after incomplete SCI: A case series. *Spinal Cord* 45(7): 522-30, 2007.
- A Jayaraman, **CM Gregory**, M Bowden, J Stevens, P Shah, AL Behrman & K Vandenborne. Skeletal muscle function in persons after incomplete SCI. *Spinal Cord*; 44(11); 680-7, 2006.
- PK Shah, JE Stevens, **CM Gregory**, N Pathare, A Jayaraman, CS Bickel, M Bowden, AL Behrman, G Walter, GA Dudley, K Vandenborne. Skeletal Muscle Morphology after Incomplete Spinal Cord Injury. *Archives of Physical Medicine and Rehabilitation*, 87(6): 772-8, 2006.
- CM Gregory** and CS Bickel. Recruitment patterns in human skeletal muscle during electrical stimulation. *Physical Therapy*, 85(4); 358-64, 2005.
- CM Gregory**, RH Williams, K Vandenborne & GA Dudley. Enzymes of energy supply and energy demand as predictors of glycogen utilization in human skeletal muscle. *European Journal of Applied Physiology* 95(4): 276-82, 2005.
- CM Gregory**, K Vandenborne, JE Ottenweller, HFS Huang & GA Dudley. Effects of testosterone replacement therapy on skeletal muscle after SCI. *Spinal Cord*, 41(1): 23-28, 2003.
- S Levine, T Nguyen, LR Kaiser, NA Rubinstein, G Maislin, **C Gregory**, LC Rome, GA Dudley, GC Sieck & JB Shrager. Human diaphragm remodeling associated with COPD: clinical implications. *American Journal of Respiratory & Critical Care Medicine*, 168(6): 706-13, 2003.
- CM Gregory**, K Vandenborne, MJ Castro & GA Dudley. Human and rat skeletal muscle adaptations to spinal cord injury. *Canadian Journal of Applied Physiology*, 28(3): 491-500, 2003.
- S Levine, **C Gregory**, T Nguyen, JB Shrager, LR Kaiser, NA Rubinstein, and GA Dudley. Bioenergetic adaptation of individual human diaphragmatic myofibers to severe chronic obstructive pulmonary disease. *Journal of Applied Physiology*, 92(3): 1205-1213, 2002.
- CM Gregory**, K Vandenborne & GA Dudley. Metabolic enzymes and phenotypic expression among human locomotor muscles. *Muscle & Nerve*, 24(3): 387-393, 2001.

Presentations at Scientific Meetings:

- CM Gregory**, CS Bickel, K Stegath and WE Dixon. The impact varying stimulation intensity and contraction type on the force-frequency relationship in human skeletal muscle during NMES. *APTA Combined Sections Meeting, Nashville, TN, 2008.*
- CM Gregory**, S Mathur, T Lentz, S Tillman, J Woodard and K Vandenborne. Impact of immobilization and subsequent rehabilitation on muscle size and function. *APTA Combined Sections Meeting, Nashville, TN, 2008.*
- S Mathur, **CM Gregory**, T Lentz, MT Scarborough, PC Gibbs, GA Walter and K Vandenborne. Rehabilitation leads to greater improvements in muscle size than function following cast immobilization. *APTA Combined Sections Meeting, Nashville, TN, 2008.*
- CS Bickel and **CM Gregory**. Reducing frequency of stimulation reduces fatigue when initial starting forces remain the same. *APTA Combined Sections Meeting, Boston, MA, 2007.*
- PK Shah, **CM Gregory**, JE Stevens, N Pathare, A Jayaraman, M Bowden, AL Behrman, G Walter, GA Dudley, K Vandenborne. Proton spectroscopic assessment of soleus muscle in persons with incomplete SCI. *APTA Combined Sections Meeting, Boston, MA, 2007.*
- A Jayaraman, P Shah, **CM Gregory**, M Liu, G Walter and K Vandenborne. Skeletal muscle adaptations following incomplete spinal cord injury and locomotor training. *APTA Combined Sections Meeting, Boston, MA, 2007.*
- CM Gregory**, M Bowden, A Jayaraman, P Nair, S Kautz, A Behrman and K Vandenborne. Lower extremity strength measures as predictors of locomotor function after incomplete spinal cord injury. *ACSM Annual Meeting, New Orleans, LA, 2007.*
- CS Bickel and **CM Gregory**. Matching initial torque while varying pulse frequency, duration, and amplitude influences skeletal muscle fatigue. *ACSM Annual Meeting, New Orleans, LA, 2007.*
- K Stegath, N Sharma, **CM Gregory** and WE Dixon. An extremum seeking method for non-isometric neuromuscular electrical stimulation. *IEEE International Conference on Systems, Man and Cybernetics, Montreal, Canada, 2007.*
- K Stegath, N Sharma, **CM Gregory**, and WE Dixon, Experimental demonstration of RISE-based NMES of human quadriceps muscle. *IEEE-NIH Life Science Systems and Applications, Bethesda, MD, 2007.*
- A Jayaraman, EM Mahoney, **CM Gregory**, CS Bickel, K Vandenborne and GA Dudley. Relationship between changes in muscle size following 12 weeks of NMES induced resistance training using MRI and fiber specific analyses in persons with complete spinal cord injury. *APTA Combined Sections Meeting, San Diego, CA, 2006.*
- CM Gregory** and CS Bickel. Impact of varying parametric settings on torque production during electrically stimulated muscle contractions. *APTA Combined Sections Meeting, San Diego, CA, 2006.*
- PK Shah, JE Stevens, **CM Gregory**, N Pathare, A Jayaraman, CS Bickel, M Bowden, AL Behrman, G Walter, GA Dudley, K Vandenborne. Skeletal Muscle Morphology after Incomplete Spinal Cord Injury. *ACSM Annual Meeting, Denver CO, 2006.*
- K Vandenborne, **CM Gregory**, GA Walter, R Shi, MT Scarborough and YW Chen. Molecular signatures associated with skeletal muscle disuse atrophy in humans. *ACSM Annual Meeting, Denver CO, 2006.*
- CM Gregory**, ET Mahoney, CS Bickel, GA Dudley, YW Chen and K Vandenborne. Molecular signature associated with improvements in muscle mass and glucose tolerance after spinal cord injury. *ACSM Annual Meeting, Denver CO, 2006.*
- CM Gregory**, BD Thattaliyath, GS Gaidosh, M Liu, BJ Byrne, K Vandenborne and GA Walter. IGF-1 and hypertrophy in human skeletal myoblasts. *Society for Muscle Biology, Frontiers in Myogenesis Meeting, Callaway Gardens, GA, 2006.*
- A Jayaraman, **CM Gregory**, M Bowden, J Stevens, P Shah, AL Behrman & K Vandenborne. Changes in skeletal muscle function after treadmill training in persons with incomplete SCI. *APTA Combined Sections Meeting, New Orleans, LA, 2005.*
- CS Bickel, **CM Gregory**, ET Mahoney, & GA Dudley. Glycogen use in skeletal muscle fibers after low and high amplitude neuromuscular electrical stimulation: a case study. *APTA Combined Sections Meeting, New Orleans, LA, 2005.*
- A Jayaraman, P Shah, **CM Gregory**, J Stevens, M Bowden, G Walter AL Behrman and K Vandenborne. Mechanisms of muscle dysfunction in persons after incomplete spinal cord injury. *ACSM Annual Conference, Nashville, TN, 2005.*

- CM Gregory**, A Jayaraman, M Bowden, AL Behrman and K Vandenborne. Resistance training and muscle function in persons after incomplete spinal cord injury. *ACSM Annual Conference, Nashville, TN, 2005.*
- CM Gregory**, A Jayaraman, M Bowden, S Kautz, A Behrman and K Vandenborne. Resistance training and locomotor recovery after incomplete spinal cord injury. *American Paraplegia Society-Annual Conference, Las Vegas, NV, 2005.*
- A Jayaraman, **CM Gregory**, M Bowden, J Stevens, P Shah, AL Behrman and K Vandenborne. Skeletal muscle function in persons after incomplete spinal cord injury. *Society for Neuroscience Annual Conference, San Diego, CA, 2004.*
- CM Gregory**, K Vandenborne and GA Dudley. Effects of testosterone replacement therapy on skeletal muscle after spinal cord injury. *ACSM Annual Conference, St. Louis, MO, 2002.*
- CM Gregory**, K Vandenborne, HFS Huang, JE Ottenweller, GS Morris & GA Dudley. Effects of testosterone replacement therapy on rat skeletal muscles after spinal cord injury. *Texas ACSM Annual Meeting, Georgetown, TX, 2002.*
- CM Gregory** & GA Dudley. Relationship between enzymes of energy supply and demand and glycogen utilization. *ACSM Annual Conference, Baltimore, MD, 2001.*
- CM Gregory**, K Vandenborne & GA Dudley. Matching of fiber type and enzyme machinery among human skeletal muscles. *ACSM Annual Conference, Indianapolis, IN, 2000.*
- M Eastlack, G Walter, D Lenrow, G Dudley, A Swift, S Yim, **CM Gregory**, M Vardaro & K Vandenborne. A comparison of in-vitro enzymatic assays with in-vivo ³¹P-MRS of muscle metabolism. *ACSM Annual Conference, Orlando, FL, 1999.*
- R Williams, **CM Gregory**, SW Stevenson, M Saunders, K Cureton & GA Dudley. Muscle glycogen loss & enzyme capacity. *ACSM Annual Conference, Orlando, FL, 1999.*
- CM Gregory**, RH Williams, K Vandenborne, & GA Dudley. Metabolic determinants of energy supply and energy demand in antagonistic human leg muscles. *ACSM Annual Conference, Denver, CO, 1998.*
- SW Stevenson, AC Baldwin, **CM Gregory**, KJ Simpson & GA Dudley. Eccentric exercise alters gait in older individuals. *ACSM Annual Conference, Denver, CO, 1998.*
- CM Gregory**, T Nguyen, J Shrager, L Kaiser, N Rubenstein, GA Dudley & S Levine. Fiber type specific characteristics of the costal diaphragm in COPD. *ACSM Annual Conference, Orlando, FL, 1999.*

INVITED PRESENTATIONS:

- Resistance Training for the Young Athlete: Focus on the Core.** NovaCare Educational Symposium: Athens, GA. - August 2002.
- Skeletal muscle plasticity after spinal cord injury.** Rehabilitation Research Seminar Series, University of Florida: Gainesville, FL. - February 2004.
- Muscle function and locomotor recovery after incomplete spinal cord injury.** Locomotor Training & Recovery Research Retreat: Gainesville, FL. - November 2004.
- Strategies to Promote Neuromuscular Plasticity following Spinal Cord Injury.** Brooks Rehabilitation Center – Research Symposium, Jacksonville, FL. - March 2005.
- Influence of parametric settings on torque output and fatigue during electrical stimulation of human skeletal muscle.** Shepherd Center Research Symposium; Atlanta, GA - March 2006.

RESEARCH FUNDING:

On-going Projects:

Peripheral muscle properties and the energetic cost of walking post-stroke.

Agency: Department of Veterans Affairs

Type: Career Development Award-2 (Preceptors: Steven A. Kautz, PhD Krista Vandenborne PhD, PT andCarolynn Patten PhD PT)

Role: PI

- *The long-term goal of this proposal is to combine state-of-the-art biomechanical analyses with advanced MR imaging and spectroscopy to examine the roles that altered coordination as well as peripheral muscle adaptations have in contributing to the increased metabolic demand of hemiparetic walking.*

Molecular signatures of muscle rehabilitation following cast-immobilization.

Agency: National Institutes of Health

Type: R01

Role: Project Coordinator (PI: Vandeborne)

- *The long-term goal of this proposal is to identify the molecular (transcriptional) pathways associated with muscle remodeling in response to rehabilitation in a patient cohort.*

Pending Proposals:

Mechanisms underlying the increased metabolic cost of hemiparetic walking

Agency: American Heart Association

Type: Scientist Development Grant

Role: PI

- *Our primary hypothesis is that in persons with hemiparesis following stroke, the increased metabolic cost of walking is in part due to increased estimates of mechanical work as well as impaired contractile and energetic properties of skeletal muscle.*

Actions of Trenbolone on hypogonadism induced bone and muscle loss

Agency: National Institutes of Health

Type: RO3

Role: Co-Investigator

- *Our purpose is to determine the overall efficacy of this novel countermeasure during 25-days of simulated microgravity at mitigating the losses of skeletal muscle mass, strength and endurance.*

Relationship between plantar flexor power and locomotor function in post-stroke hemiparesis

Agency: National Institutes of Health

Type: R03

Role: PI

- *The fundamental hypothesis guiding this proposal is that impaired neuromuscular function limits locomotor ability post-stroke and rehabilitation programs specifically targeting muscular impairments will attenuate existing deficits and improve locomotor ability.*

Completed Projects:

Neuromuscular function and locomotor ability after central nervous system injury

Agency: Department of Veterans Affairs

Type: Associate Investigator Award (573/05B1)

Role: PI (Preceptors: Steven A. Kautz PhD and Krista Vandeborne PhD, PT)

Profiling of skeletal muscle remodeling following spinal cord injury and rehabilitation

Agency: Children's National Medical Center

Type: Pilot proposal: NCMRR-National Rehab Research Core Grant

Role: Co-PI (PI: Vandeborne)

Development of a local histology and image analysis core facility

Agency: Malcom Randal VAMC

Type: Equipment Grant

Role: PI

Strategies to promote neuroplasticity after disuse atrophy

Agency: National Institutes of Health

Type: Clinical Research LRP

Role: PI

Skeletal muscle adaptations to locomotor training after stroke

Agency: Brain Rehabilitation Research Center

Type: Intramural Research Funding

Role: PI

TEACHING EXPERIENCE:

University of Georgia:

EXRS 6000: **Applied Exercise Science** (Instructor)
EXRS 6100: **Exercise Physiology** (Laboratory Instructor) 6
EXRS 6400: **Muscle Biology** (Laboratory Instructor)
EXRS 8110: **Exercise Biochemistry** (Laboratory Instructor)

Texas Woman's University:

PT 5015: **Gross Anatomy** (Laboratory Instructor)
PT 5905: **Return to Sport Clinical Selective** (Instructor)

University of Florida:

PHT 6340: **Exercise Physiology** (Instructor)
PHT 6190c: **Basic Skills II** (Instructor)
RSD 6110: **Introduction to Rehabilitation Science** (Case Study Mentor)
PHT 6319c: **Neurological Rehabilitation** (Guest Laboratory Instructor)

PROFESSIONAL SERVICE:

Ad-Hoc Reviewer:

Journal of Athletic Training
European Journal of Applied Physiology
Physical Therapy
Archives of Physical Medicine and Rehabilitation
Journal of Spinal Cord Medicine
Clinical Biomechanics
Neuroscience Letters
Medicine & Science in Sports & Exercise
Spinal Cord
Muscle & Nerve
Journal of Applied Physiology
Clinical Neurophysiology
Chest
IEEE Transactions on Mechatronics
Experimental Brain Research

Professional Affiliations:

American College of Sports Medicine (ACSM)
National Strength & Conditioning Association (NSCA)
National Athletic Trainers Association (NATA)
American Physiological Society (APS)
American Physical Therapy Association (APTA)

Licenses and Certifications:

Certified Strength & Conditioning Specialist (NSCA) – 96-09-06-100
Certified Athletic Trainer (NATA) – 070202024
- State of Florida Licensure – AL 1673
Licensed Physical Therapist (APTA)
- State of Florida Licensure – PT 21721