

Timothy Alan Butterfield

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EDUCATION

University of Calgary

Ph.D., Biomechanics 2005
Supervisor: Prof. Walter Herzog
Dissertation Topic: Magnitude of fiber strain during repetitive eccentric exercise and the relation to musculoskeletal damage and mechanical adaptation.
CIHR Clinician-Scientist Program in Bone and Joint Health

Old Dominion University

M.Sc., Sports Medicine/Athletic Training 1992
Major Field of Study: Athletic Training
Advisor: Marty Bradley MSc, ATC

Messiah College

B.S., Biology 1990
Major Field of Study: Biology with an emphasis in Sports Medicine
Advisor: Edwin 'Sandy' Bush MSc, ATC

SUNY Potsdam

B.A., Biology 1999
Advisor: Professor Al Robinson

CERTIFICATIONS

NATABOC certification # 0000030775	June 1990-present
CRC CPR certification	September, 2002
Emergency Medical Technician recertification (NY)	January, 2000
AHA AED Instructor training	November, 1998
ARC First Aid and CPR Instructor training	September, 1998
Emergency Medical Technician Instructor training	November, 1996

MEMBERSHIPS

American Society of Biomechanics	2001-present
Canadian Society of Biomechanics	2001-present
International Society of Biomechanics	2001-present
New York State Athletic Trainers' Association	1997-present
Eastern Athletic Trainers' Association	1992-present
National Athletic Trainers' Association	1988-present

EXPERIENCE

The Ohio State University, Columbus, OH

College of Medicine and Public Health
Department of Family Medicine

Post-Doctoral Researcher September 2005-present

Supervisor: Prof. Tom Best MD PhD FACSM

Research will focus on the attenuation of secondary cellular injury following active muscle strain, and attempt to accelerate the regenerative process while inhibiting fibrosis. Preliminary work is under way to create a repeatable, reliable model of disruptive muscle strain injury in rabbits with modified neutrophil function to assess the role of secondary injury and scar production. Subsequent studies will focus on anti-fibrotic agents, cellular repair and restoration of muscle function and the difference between young and old animals.

University of Calgary, Calgary, AB

Human Performance Laboratory / Faculty of Kinesiology

PhD, Candidate August 2001-August 2005

Supervisor: Prof. Walter Herzog

Research: Magnitude of fiber strain during repetitive eccentric exercise in *in-situ* and *in-vivo* animal models. Relation of muscle strain and force to musculoskeletal damage and mechanical adaptation. Implications for prevention and treatment of muscle strain injury.

Guest Lecturer March, April, 2003

Developed lectures and instructed skeletal muscle injury/adaptation section of graduate level muscle mechanics course, KNES 663.

Guest Lecturer October, 2003

Developed lectures and instructed skeletal muscle mechanics for KNES 363

Department of Kinesiology / Sport Medicine

Teaching Assistant Winter 2005

Created lecture material, quizzes and exams. Taught introductory undergraduate laboratories for KNES 371: Scientific Basis for the Prevention and Care of Injuries.

Teaching Assistant Fall 2004

Created lecture material and quizzes. Taught undergraduate laboratories for KNES 261: Gross Anatomy.

Teaching Assistant Fall 2003

Created lecture material and quizzes. Taught undergraduate laboratories for KNES 261: Gross Anatomy.

Clinical Supervisor Fall 2003

Supervision and evaluation of Athletic Therapy students for Mount Royal College, PHED1350: Field Practicum.

Teaching Assistant Winter 2003
Created lecture material, quizzes and exams. Taught introductory undergraduate laboratories for KNES 371: Scientific Basis for the Prevention and Care of Injuries.

Teaching Assistant Winter 2002
Created lecture material, quizzes and exams. Taught introductory undergraduate laboratories for KNES 371: Scientific Basis for the Prevention and Care of Injuries.

Athletic Therapist September 2001-present
Served as a staff Athletic Therapist for the Sports Therapy Services at the University of Calgary, providing injury care and assessment to local area football and hockey teams. .

SUNY Potsdam, Potsdam, NY

Department of Athletics

Head Athletic Trainer June 1998 – August 2001
Responsible for comprehensive health care for student athletes and recreational athletes at the University as well as administrative duties. Oversaw a staff of two part-time assistants, 12 undergraduate students, 2 graduate students and 2 interns.

Department of Community Health

Adjunct Instructor July, 2004
Course taught: HLTH 495. Physiological Aspects of Aging, Disease and Physical Activity. Summer session III.

Instructor June 1998 – August 2001
Courses taught: Kinesiology, Exercise Physiology, Introduction to Sports Medicine, Responding to Emergencies

Guest Lecturer November, 2000
Department of Community Health. Lecture titled: "Anabolic Steroids."

Guest Lecturer March, 2000
Department of Community Health. Lecture titled: "Ergogenic Aids and Sports."

Guest Lecturer October, 1999
Department of Community Health. Lecture titled: "The Physiology of Strength Training."

Clarkson University, Potsdam, NY

School of Health Sciences / Department of Physical Therapy

Clinical Instructor August 1999 – August 2001
Offsite Clinical Instructor for musculoskeletal component of Master of Physical Therapy (MPT) program.

Guest Lecturer July, 2004
"Mechanical Properties of Skeletal Muscle"

United States Olympic Training Center, Lake Placid, NY

Athletic Trainer February, 1998
Served as a volunteer staff Athletic Trainer for Bobsled, Luge and short-track speedskating.

Samaritan Medical Center, Watertown, NY

Department of Physical Therapy / Sports Medicine Outreach Program

Head Athletic Trainer August 1997-June, 1998
Developed a sports medicine outreach program and weekend walk-in injury clinic for local area high school and amateur athletes.

Mansfield University, Mansfield, PA

Department of Athletics

Head Athletic Trainer - Football July 1992 – August, 1998
Primary responsibility as athletic therapist for NCAA division II football program and provided clinical care for student athletes and recreational athletes between seasons.

1996 Summer Olympic Games, Atlanta, GA

ACOG volunteer

Athletic Trainer –Field Hockey July 1996
Primary responsibility as athletic trainer for men’s and women’s field hockey practices and competitions before and during the 1996 summer games in Atlanta, GA.

1993 Empire State Games, Rochester, NY

Athletic Trainer –women’s basketball July 1996
Primary responsibility as athletic trainer for women’s basketball.

Virginia Wesleyan College

Department of Athletics

Head Athletic Trainer July 1990 – June, 1992
Responsible for comprehensive health care for student athletes at the College as well as administrative duties. Oversaw a staff of 6 undergraduate students.

Hampton Roads Admirals, ECHL hockey

Athletic Trainer December 1991-April, 1992

PUBLICATIONS

Peer-Reviewed Journal Articles

Butterfield TA, Herzog W. "Alterations in Starting Length and Activation Timing of Muscle Influence Fiber Strain and Muscle Injury." *Journal of Applied Physiology* (in revision, Publisher's ID JAP-00524-2005R1).

Butterfield TA, Herzog W. "The Magnitude of Muscle Strain Does Not Influence Serial Sarcomere Number Adaptations Following Eccentric Exercise." *Pflügers Archiv-European Journal of Physiology* (in press, doi:10.1007/S00424-005-1503-6).

Butterfield TA, Leonard TR, Herzog W. "Differential Serial Sarcomere Number Adaptations in Knee Extensor Muscles of Rats is Contraction Type Dependent." *Journal of Applied Physiology* (in press, doi:10.1152/jappphysiol.00481.2005).

Butterfield TA, Herzog W. Quantification of Muscle Fiber Strain During *In-vivo* Repetitive Stretch-Shortening Cycles. *Journal of Applied Physiology*. 99. 593-602, 2005.

Butterfield TA, Herzog W. Is the Force-Length Relationship a Reliable Indicator of Contractile Element Damage Following Eccentric Exercise? *Journal of Biomechanics*. 38 (9). 1932-1937, 2005.

Longino D, **Butterfield TA**, Herzog W. Frequency and Length Dependent Effects of Botulinum Toxin-Induced Muscle Weakness. *Journal of Biomechanics*. 38. 609-613, 2005.

Abstracts and Proceedings

Butterfield TA, Herzog W. "The Interaction of Surface Grade and Exercise Duration for Serial Sarcomere Adaptations Following Treadmill Running in Rats." American Society of Biomechanics and International Society of Biomechanics Combined Conference, August 1-5, 2005. Cleveland, OH.

Butterfield TA, Herzog W. "Can an Altered Neuromuscular Coordination Pattern Result in Muscle Strain Injury?" Canadian Athletic Therapists Association 39th Annual Conference, May, 8-25-28, 2005. Calgary, AB.

Butterfield TA, Herzog W. "Small Changes in the Timing of Activation Affects Fiber Length and Sarcomere Number Adaptations in the Rabbit Tibialis Anterior Exposed to Eccentric Exercise." American Society of Biomechanics, Annual Conference, September, 8-11, 2004. Portland, OR.

Butterfield TA, Herzog W. "The Effect of Muscle Activation Timing on Fiber Strain During Eccentric Contractions." Canadian Society of Biomechanics, 13th Biennial Conference, August 4-7, 2004. Halifax, NS.

Butterfield TA, Herzog W. "The Adaptive Response of Skeletal Muscle to Repetitive Strain Injury." Fourth Alberta Biomedical Engineering Conference Proceedings. Banff, Alberta: October 24-26, 2003.

Butterfield TA, Herzog W. "Sarcomere Number Adaptation in the Rabbit Tibialis Anterior After Chronic Eccentric Exercise. Proceedings of the 27th Annual Meeting of the American Society of Biomechanics. September 24-26, 2003

Butterfield TA, Herzog W. “Sarcomere Number Adaptation in the Rabbit Tibialis Anterior After Chronic Eccentric Exercise.” 2003 American Society of Biomechanics Annual Conference.

Butterfield TA, Herzog W. “Fiber Strain and Damage During Eccentric Exercise in the Rabbit TA.” Third Alberta Biomedical Engineering Conference Proceedings. Banff, Alberta: November 8-10, 2002.

Butterfield TA, Herzog W. “Acute Bout of Eccentric Exercise in the Rabbit TA Shows Concomitant Fiber Length Shortening and a Subsequent Shift in the Force-Length Relationship.” IV World Congress of Biomechanics Proceedings CD. Calgary, Alberta: Omnipress; 2002.

Butterfield TA, Gardner MM. “The Effects of Pre-Exercise Ultrasound on Delayed Onset Muscle Soreness.” SUNY Potsdam Learning and Research Fair Publication. March 2001.

PRESENTATIONS

“The Interaction of Surface Grade and Exercise Duration for Serial Sarcomere Adaptations Following Treadmill Running in Rats.” *Podium Presentation* at the American Society of Biomechanics and International Society of Biomechanics Combined Conference, August 4, 2005. Cleveland, OH.

“Can an Altered Neuromuscular Coordination Pattern Result in Muscle Strain Injury?.” *Podium Presentation* at the Canadian Athletic Therapists Association 39th Annual Conference, Calgary, AB, Canada: May, 8-25-28, 2005

“Small Changes in the Timing of Activation Affects Fiber Length and Sarcomere Number Adaptations in the Rabbit Tibialis Anterior Exposed to Eccentric Exercise.” *Podium Presentation* at the American Society of Biomechanics, Annual Conference, Portland, OR: September, 8-11, 2004

“The Effect of Muscle Activation Timing on Fiber Strain During Eccentric Contractions.” *Podium Presentation* at the Canadian Society of Biomechanics, 13th Biennial Conference, Halifax, NS: August 4-7, 2004.

“The Adaptive Response of Rabbit Dorsiflexor Muscle to Repetitive Strain Injury.” *Poster Presentation* at the first Annual Alberta Provincial CIHR Conference Proceedings. Banff, AB: October 23-24, 2003

Sarcomere Number Adaptation in the Rabbit Tibialis Anterior After Chronic Eccentric Exercise. *Podium presentation* at the American Society of Biomechanics Annual Conference. Toledo, OH: September 25, 2003.

“The Force-length Relationship Shift and Rotation After Injury.” *Podium presentation* at the III Alberta Biomedical Engineering Conference. Banff, AB: November 10, 2002.

“Acute Bout of Eccentric Exercise in the Rabbit TA Shows Concomitant Fiber Length Shortening and a Subsequent Shift in the Force-Length Relationship.” *Poster Presentation* at the IV World Congress of Biomechanics, Calgary, AB. August 4-9, 2002.

“The Effects of Pre-Exercise Ultrasound on Delayed Onset Muscle Soreness.” *Poster Presentation* at SUNY Potsdam Learning and Research Fair. March 2001.

- “Management of Sports Injuries.” Athletic Injury Prevention lecture series at Indian River High School, Philadelphia NY: May, 1998.
- “Injury Prevention for Athletes.” Keynote Lecture at Lowville Academy's Athlete Education Seminars, Lowville NY: October, 1998.
- “Injury Prevention for Baseball Players.” The Tenth Annual Mansfield University Developmental Baseball Clinic, Mansfield PA: February, 1995.
- “Injury Prevention for Baseball Players.” The Ninth Annual Mansfield University Developmental Baseball Clinic, Mansfield PA: February, 1994.
- “Prevention and Care of Athletic Injuries to Adolescents.” The Ninth Annual Mansfield University Developmental Baseball Clinic, Mansfield PA: February, 1994.
- “Injury Prevention for Baseball Players.” The Eighth Annual Mansfield University Developmental Baseball Clinic, Mansfield PA: February, 1993.
- “Assessment and Treatment of Spondylolysis and Spondylolisthesis.” *Podium presentation* at the Mid Atlantic Athletic Trainers' Association Annual Convention, Virginia Beach, VA: May, 1991.

AWARDS

Kinesiology Research Centre Award for Outstanding Leadership and Contribution	2004
CIHR Clinician-Scientist Fellowship in Bone and Joint Health Award duration: Sept 2004-Aug 2005, \$20,000 Proposal: In-situ fiber strain dynamics during eccentric exercise and its relationship to muscle damage and adaptation.	2004-2005
Graduate Research Scholarship Award duration: Sept 2004-Dec2005, \$4,100	2004
CIHR Clinician-Scientist Fellowship in Bone and Joint Health Award duration: Sept 2003-Aug 2004, \$20,000 Proposal: In-situ fiber strain dynamics during eccentric exercise and its relationship to muscle damage and adaptation.	2003-2004
Journal of Biomechanics Award, Finalist American Society of Biomechanics, September 2003	2003
Graduate Teaching Assistantships	
Half GAT \$3,400	KNES 371 Sci Basis of Injury in Sports 2005
Full GAT \$6,200	KNES 261 Gross Anatomy 2004
Full GAT \$6,200	KNES 261 Gross Anatomy 2003
Half GAT \$3,200	KNES 371 Sci Basis of Injury in Sports 2003
Half GAT \$3,200	KNES 371 Sci Basis of Injury in Sports 2002
Bill Robertson Scholarship Northwest Athletic Trainers' Association. \$1,500 USD	2002

Research and Creative Endeavors Grant. SUNY Potsdam	2000
Award Duration 12 months - \$600.00	
Proposal: The effects of pre-exercise therapeutic ultrasound on delayed onset muscle soreness.	
Graduate Assistantship	1990-1992
Old Dominion University	