

# Mark S. Walsh

## Curriculum Vita 2014

### EDUCATION:

- B.S. California State University Los Angeles (1991)  
Major: Nutritional Science
- M.S. California State University Northridge (1993)  
Major: Biomechanics
- Ph.D. German Sport University of Cologne, Germany (2001)  
Major: Biomechanics and Sport Orthopedics

### PROFESSIONAL EXPERIENCE:

- Fall 2007-present Associate Professor  
Department Kinesiology and Health  
Miami University, Oxford, Ohio
- Fall 2001- Fall 2007 Assistant Professor  
Department Physical Education, Health and Sports Studies  
Miami University, Oxford, Ohio
- 2000-2001 Biomechanics Researcher  
Department of Biomechanics  
German Sport University of Cologne, Germany
- 1996-2000 Training and Movement Science Researcher  
Department of Track and Field and Gymnastics  
German Sport University of Cologne, Germany

## **SCHOLARLY FOCUS STATEMENT**

My research focuses on the mechanics of sports, balance and musculoskeletal biomechanics. This includes the mechanics of sprinting and jumping from a performance perspective with a focus on gender differences. It also includes the mechanics of landings from an injury perspective with a focus on female landing technique and its relation to injury and I conduct research examining the role of the muscle tendon complex during muscular contraction. Privately sponsored projects I have worked on include NIKE research and development, Procter and Gamble research and development, Louisville Slugger research and development and research for a German insurance company on lower back pain. These are all exciting topics that fit very well into the classes that I teach/have taught: Biodynamics of Human Movement (KNH 381), Mechanics of Musculoskeletal Injury (KNH 453/553), Functional Anatomy (KNH 244), Physics of Sport (PHY 141) and Advanced Biomechanics (KNH 688). My research directly informs the content of my courses, for example, when we talk about specificity I refer to the work that I performed with the men's and women's rugby teams in which we examined rugby specific sprints and showed that there is a very low correlation between performance in those sprints and commonly used sprint tests such as a 30 meter sprint. Video and data from our jumping/landing studies make up useful examples when presenting material on torque and valgus knee alignment.

Both undergraduate and graduate students serve as co-authors in my research program and have presented our research at regional as well as international conferences. The interaction with students serves multiple functions. First, it enriches student learning by helping them to make connections between concepts we learn in class and everyday life. Some students arrive in my class with a mental block for the physics/trigonometry that we use to analyze various sports situations. The practical applications give them something more understandable to start with to help them get over their initial fears of the material. Secondly, it's a way to introduce the various technologies used for research into the classroom. And lastly, it's an effective recruiting tool to motivate students to help with research.

My research informs my professional service through applied presentations in the areas of biomechanics and functional anatomy. I have given presentations to incoming ROTC classes on running mechanics and common overuse injuries. I have performed research on Miami's men's and women's rugby club teams, women's soccer team, and men's and women's basketball and track and field teams and afterwards I met with the coaches and some of the players on how the results could help their training.

My membership on the Board of Directors for the International Society of Biomechanics and Sport has helped to give me a global perspective on advancements in the field of biomechanics. Reviewing abstracts for the International Society of Biomechanics and Sport and the European Society of Sport Science, as well as for various journals and performing book reviews for various publishers has given me many ideas for my courses as well as scientific inquiries for my research.

## **TEACHING AND ACADEMIC ADVISING**

### A. Classroom teaching

1. Courses taught (syllabi in appendix A1)
  - a. Undergraduate

**PHS 244 - Functional anatomy**– credit hours: 4

Fall 2001	official course enrollment: 27
Spring 2002	official course enrollment: 28
Fall 2002	official course enrollment: 27
Spring 2003	official course enrollment: 26
Fall 2003	official course enrollment: 29
Spring 2004	official course enrollment: 27
Fall 2004	official course enrollment: 28
Spring 2005	official course enrollment: 31
Fall 2005	official course enrollment: 27
Spring 2007	official course enrollment: 43

**PHS 381 - Biodynamics of Human Movement** – credit hours: 3

(prefix changed later from PHS to KNH 381)

Fall 2001	official course enrollment: 60
Spring 2002	official course enrollment: 61
Summer 2002	official course enrollment: 30
Fall 2002	official course enrollment: 60
Spring 2003	official course enrollment: 66
Summer 2003	official course enrollment: 24
Fall 2003	official course enrollment: 62
Spring 2004	official course enrollment: 61
Summer 2004	official course enrollment: 30
Fall 2004	official course enrollment: 62
Spring 2005	official course enrollment: 70
Summer 2005	official course enrollment: 27
Fall 2005	official course enrollment: 58
Spring 2006	official course enrollment: 63
Summer 2006	official course enrollment: 34
Fall 2006	official course enrollment: 58
Spring 2007	official course enrollment: 63
Fall 2007	official course enrollment: 61
Spring 2008	official course enrollment:
Summer 2008	official course enrollment: 20
Fall 2008	official course enrollment:
Spring 2009	381A official course enrollment: 38
	381B official course enrollment: 34
Summer 2009	381 OA official course enrollment: 14

	381 OB official course enrollment: 14
Fall 2009	381A official course enrollment: 32
	381B official course enrollment: 28
Spring 2010	381 official enrollment: 36
Summer 2010	381 official enrollment: 14
Fall 2010	381A official enrollment: 31
	381B official enrollment: 26
Spring 2011	381 official enrollment: 43
Summer 2011	381 official enrollment: 20
Fall 2011	381A official enrollment: 32
	381B official enrollment: 27
Spring 2012	381 official enrollment: 41
Summer 2012	381 official enrollment: 21
Fall 2012	381A official enrollment: 32
	381B official enrollment: 38
Spring 2013	381 official enrollment: 34
Summer 2013	381 official enrollment: 18
Fall 2013	381A official enrollment: 31
	381B official enrollment: 37
<b>Summer 2014</b>	<b>381 official enrollment: 20</b>

**PHS 381L - Biodynamics of Human Movement Lab** - credit hours: 1  
(prefix changed later from PHS to KNH 381L)

Summer 2002	official course enrollment: 30
Summer 2003	official course enrollment: 24
Summer 2004	official course enrollment: 30
Summer 2005	official course enrollment: 27
Summer 2006	381LA official course enrollment: 15
	381LB official course enrollment: 17
Summer 2008	381LA official course enrollment: 11
	381LB official course enrollment: 8
Summer 2009	381LA official course enrollment: 14
	381LB official course enrollment: 12
Summer 2010	381LA official course enrollment: 14
Summer 2011	381LA official course enrollment: 11
	381LA official course enrollment: 9
Summer 2012	381LA official course enrollment: 11
	381LA official course enrollment: 10
<b>Summer 2013</b>	<b>381LA official course enrollment: 8</b>
	<b>381LA official course enrollment: 10</b>
<b>Summer 2014</b>	<b>381LA official course enrollment: 11</b>

**PHS 402 –Critical Reflection of Health and Human Culture** – credit hours: 3

Fall 2007	official course enrollment: 22
Spring 2009	official course enrollment: 23

**KNH 409 – Nutrition for Health and Fitness** (meets with KNH 509)

Spring 2010	official course enrollment: 31
Spring 2011	official course enrollment: 29
Spring 2012	official course enrollment: 36
Summer 2012	official course enrollment: 15
Spring 2013	official course enrollment: 30
Summer 2013	official course enrollment: 9
<b>Spring 2014</b>	<b>official course enrollment: 25</b>
<b>Summer 2014</b>	<b>official course enrollment: 11</b>

**PHS 453 – Mechanics of Musculoskeletal Injury** – credit hours:2

Spring 2007	official course enrollment: 12
Fall 2008	official course enrollment: 6
Fall 2010	official course enrollment: 9
Fall 2012	official course enrollment: 14

**PHS/SOC 499 – Life at Altitude: the Nepal Experience** – credit hours: 6

Summer 2007	official course enrollment: 12
Summer 2008	official course enrollment: 19
Summer 2009	official course enrollment: 8

**KNH/SOC/AAA 499 – Life at Altitude: the Nepal Experience** – credit hours: 6

Summer 2010	official course enrollment: 13
Summer 2011	official course enrollment: 9
Summer 2012	official course enrollment: 13
Summer 2013	official course enrollment: 9
<b>Summer 2014</b>	<b>official course enrollment: 9</b>

**PHY 141 – Physics in Sports**

Fall 2006	official course enrollment: 17
Summer 2010	official course enrollment: 12
Summer 2011	official course enrollment: 12
Summer 2012	official course enrollment: 15
Summer 2013	official course enrollment: 18
<b>Summer 2014</b>	<b>official course enrollment: 20</b>

b. Graduate

**KNH 509 – Nutrition for Health and Fitness** (meets with KNH 409)

Spring 2010	official course enrollment: 10
Spring 2011	official course enrollment: 3
Spring 2012	official course enrollment: 9
Spring 2013	official course enrollment: 10

Summer 2013	official course enrollment: 4
<b>Spring 2014</b>	<b>official course enrollment: 9</b>
<b>Summer 2014</b>	<b>official course enrollment: 2</b>

**PHS 553 – Mechanics of Musculoskeletal Injury** – credit hours:2

Spring 2007	official course enrollment: 6
Fall 2008	official course enrollment: 5
Fall 2010	official course enrollment: 10
Fall 2012	official course enrollment: 4

**PHS/SOC 599 – Life at Altitude: the Nepal Experience** – credit hour: 6  
(Later changed to KNH/SOC 599)

Summer 2007	official course enrollment: 6
Summer 2008	official course enrollment: 12
Summer 2009	official course enrollment: 2
Summer 2010	official course enrollment: 2
Summer 2011	official course enrollment: 2
Summer 2012	official course enrollment: 1

**PHS 631 – Physiological and Motoric Aspects of Sport** – credit hours:3

Spring 2002	official enrollment 11
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(split teaching with Helaine Alessio)

**PHS 682 – Laboratory Techniques in Exercise Science** – credit hours - 2

Fall 2005	official enrollment 9
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(split teaching with Randy Claytor)

**PHS 688 – Advanced Biomechanics** – credit hours – 3

Spring 2006	official enrollment 17
Fall 2007	official enrollment 17
Fall 2009	official enrollment 15
Fall 2011	official enrollment 19
Fall 2013	official enrollment 10

## **RESEARCH AND SCHOLARSHIP**

### A. Publications

#### 1. Books

##### a. Scholarly books

Walsh, M (2001). *Ermuedungsinduzierte Aenderung von Kinematik, Kinetik und Muskulaerer Aktivitaet im Dehnungs-Verkuerzungs-Zyklus bei reptitiven Sprungssimulationen*. Cologne, Sport und Buch Strauss.  
English translation – The effects of fatigue on the biomechanics of jumping.  
Publisher: Sport & Buch Strauss, ISBN:3-89001-270-1

b. Chapters in books

Arampatzis, A., Brueggemann, G.-P., Walsh, M. (1997). Biomechanical Analysis of the Jumping Events: Long Jump. In Biomechanical Research Project, Athens 1997; Final Report. pp.83-113, Oxford: Meyer & Meyer.

2. Refereed Journals Articles

\*Harper E., Strang A., **Walsh M.**, \*Caserta B., Haworth J., \*Hieronymus M.(2012). Contributions of respiration rate and volume to changes in postural control following a 5k-run. *Gazzetta Medica Italiana Archivio per le Scienze Mediche* August;171(4):437-46

Adam Strang, \*Joshua Haworth, \*Mathias Hieronymus, **Mark Walsh**, L.James Smart. (2011) Structural changes in postural sway lend insight into effects of balance training, vision, and support surface on postural control in a healthy population. *European Journal of Applied Physiology*: Volume 111, Issue 7 (2011), Page 1485-1495

**Mark Walsh**, \*Andreas Peper, \*Stefanie Bierbaum ;Kiros Karamanidis; Adamantios Arampatzis (2011). Effects of submaximal fatiguing contractions on the components of dynamic stability control after forward falls. *Journal of Electromyography and Kinesiology*. Vol. 21 (2), pp. 270-5

\*Brandon Kistler, **Mark Walsh**, Thelma Horn, Ron Cox (2009). The acute effects of static stretching on the sprint performance of collegiate males in the 60 and 100 meter dash following a dynamic warm up. *Journal of Strength and Conditioning Research*. 21 (3)

Dean Smith, **Mark Walsh**, Jane Smith (2008). Improved running performance immediately following chiropractic adjustments in a patient with xeroderma pigmentosum. *Journal of Manipulative and Physiological Therapeutics* 32 (1): 93-8

Harald Böhm, Stefan Siebert, **Mark Walsh**, Veit Senner

(2008). Effects of short-term training using SmartCrank on cycle work distribution and power output during cycling. European Journal of Applied Physiology pp. 225 - 232

\*Mademli, L., Arampatzis, A., **Walsh, M.** (2008). Effect of Muscle Fatigue on the Compliance of the Vastus Lateralis Tendon and Aponeurosis. Journal of Biomechanical Engineering.(130)

Adamantios A., \*Mademli, L., De Monte, G., **Walsh, M.** (2007). Changes in Fascicle length from rest to maximal voluntary contraction affect the assessment of voluntary activation. Journal of Biomechanics.(40) 3193-3200

**Walsh, M.**, Waters, J. Kersting, U. (2007). The effect of instructions on drop jump parameters in NCAA division I basketball players. *Research in Sports Medicine* 15 (4)

**Walsh, M.**, Waters, J., Bohm, H., Potteiger, J. (2007) Gender bias in jumping kinetics in NCAA division I level basketball players. *Journal of Strength and Conditioning Research.* 21 (3)

**Walsh, M.**, Bohm, H., \*Butterfield, M., \*Santhosam, J. (2007). Gender differences in biomechanical parameters during jumping with and without the use of a countermovement and arm swing. *Journal of Strength and Conditioning Research.* 21 (2)

\***Walsh, M.**, \*Young, B., \*Hill, B., Horn, T., Kittridge, K. (2007) The effect of experience and gender on sprinting in rugby union football players. *Journal of Sport Science.*

\***Walsh, M.**, Ford, K., \*Bangen, K., Meyer, G., Hewitt, T. (2006) The validation of a portable force plate for measuring force-time data during jumping and landing tasks. *Journal of Strength and Conditioning Research.*20(4). 730-734.

\*Mademli, L., Arampatzis, A., **Walsh, M.** (2005) Effect of Muscle Fatigue on the Compliance of the Gastrocnemius Medialis Tendon and Aponeurosis. *Journal of Biomechanics.* 39. 426-434.

**Walsh, M.** Arampatzis, A. Schade, F. Brueggemann, G.-P. (2003). The effect of Drop Jump Starting Height and Contact Time on Power, Work Performed and Moment of Force. *Journal of Strength and Conditioning Research.* 18(3). 561-566.

Arampatzis, A. Schade, F. **Walsh, M.** Brueggemann, G.-P. (2001) Influence of leg stiffness and its effect on myodynamic jumping performance. *Journal of Electromyography and Kinesiology*, 11, 355-364.

3. Conference proceedings (\*indicates student co-author)

a. International

**Walsh, M.S.** Hohl, J. Strang, A. Haworth, J. (2014). Specificity: Brick training for the bike to run transition in the triathlon. Presented July 2014 at the XXXII Symposium of the International Society of Biomechanics in Sports, Tennessee, USA.

Slattery, E. **Walsh, M.** Hacker, J (2014). Assessment of muscle activation ratios during lower extremity resistance exercises. Presented July 2014 at the XXXII Symposium of the International Society of Biomechanics in Sports, Tennessee, USA.

**Walsh, M. S.** Funk, R. Ohlinger, C. Cox, R. (2013). Using the active work station: Can we be active at work and still be productive? Presented July 2013 at the 18<sup>th</sup> Annual Congress of the European College of Sports Science. Barcelona, Spain.

\***Walsh, M. S.**, Harper, E, Waxman, J.P. Baldwin, C. (2011) Running in Traditional Running Shoes vs Minimalist Running Footwear: A Kinematic Comparison. Presented July 2011 at the 16<sup>th</sup> Annual Congress of the European College of Sports Science. Liverpool, Great Briton.

\*Baldwin, C., **Walsh, M.**, Cox, R., Massie, B., Harper, E. (2011). The effect of Simulated Altitude Exposure Via Rebreathing on interval performance. Presented July 2011 at the 16<sup>th</sup> Annual Congress of the European College of Sports Science. Liverpool, Great Briton.

\*Harper, E. **Walsh, M.** Baldwin, C (2011). The Effects of Static and Dynamic Stretching on Competitive Gymnastics Split Jump Performance. Presented July 2011 at the 16<sup>th</sup> Annual Congress of the European College of Sports Science. Liverpool, Great Briton.

\*Waxman, J. Tutalo Smith, **Walsh, M.**, and Noyes, F. (2011) The Effects of a 6-Week Neuromuscular Training Program on Knee Joint Motor Control During Sidecutting in High-School Female Athletes. Presented July 2011 at the 16<sup>th</sup> Annual Congress of the European College of Sports Science. Liverpool, Great Briton

\*Erin Harper, Adam Strang, **Mark Walsh**, Brittany Caserta, Joshua Haworth, & Mathias Hieronymus (2010). Effect of respiration dynamics on postural control following a 5K run. Presented July 2010 at the XXVIII Symposium of the International Society of Biomechanics in Sports, Michigan, USA.

\*Brittany Caserta, Adam Strang, Mathias Hieronymus, Josh Haworth, **Mark Walsh** (2010) Balance training alters postural dynamics uniquely for stance on compliant vs non-compliant surfaces. Presented July 2010 at the XXVIII

Symposium of the International Society of Biomechanics in Sports, Michigan, USA.

\***Walsh M.**, Strang, A., Hieronymus, M., Haworth J. (2009) The effect of exhaustive running on postural dynamics. Presented August 2009 at the XXVIIth Symposium of the International Society of Biomechanics in Sports. Limerick, Ireland

\***Walsh, M.**, Strang, A., Hieronymus, M., Haworth, J., Smart, L. (2009). Balance training alters postural dynamics uniquely for stance on compliant vs. non-compliant surfaces. Presented July 2009 at the 14<sup>th</sup> Annual Congress of the European College of Sports Science. Oslo, Norway.

\*Joshua Haworth, Adam Strang, Mathias Hieronymus, **Mark Walsh** (2009). Postural control response to a stance on compliant surface. Presented at the American Society of Biomechanics Meeting, at Penn State, Pa.

\***Walsh, M.**, Karamanidis, K. Pepper A., Bierbaum S., Arampatzis A Effect of submaximal fatiguing contractions on the components of dynamic stability control after forward falls (2008). Presented July 2008 at the 13<sup>th</sup> Annual Congress of the European College of Sports Science. Estoril, Portugal.

\***Walsh, M.**, Haworth, J. Behm, A. Ansberry, C. Petak, A. The Effect of Fatigue on Biomechanical Parameters Associated with Knee Injury. (2007). Presented July 2007 at the 12<sup>th</sup> annual congress of the European College of Sports Science. Jyväskylä, Finland.

\***Walsh, M.** Creekmur, C, Prectel, R (2006) Can we increase ollie height by manipulating the truck configuration on skateboards. Presented August 2006 at the XXIVth Symposium of the International Society of Biomechanics in Sports. Salzburg, Austria.

**Walsh, M.**, Mademli, L., Arampatzis, A. (2006). The effects of aging on function of the triceps surae muscle group during fatiguing isometric contractions. Presented July 2006 at the 11<sup>th</sup> annual congress of the European College of Sports Science. Lausanne, Switzerland.

\***Walsh, M.**, Young, B. Hill, B. (2005) Sprint specificity for rugby and soccer players. Presented August 2005 at the XXIIIrd Symposium of the International Society of Biomechanics in Sports. Beijing, China

Mademli, L., **Walsh, M.**, Brueggemann, G.-P., Arampatzis, A.(2005) Neuromechanic behaviour of the gastrocnemius medialis muscle tendon unit during submaximal isometric fatigue. Presented March 2005 collaborative meeting of the German Society of Biomechanics and the Swiss Biomechanica meeting in Hamburg , Germany. (Winner of the Student Research Award)

\***Walsh, M.**, Ford, K., Bangen, K., Meyer, G., Hewitt, T.(2005) Validation of a portable force plate to assess jumping and landing performance. Presented August 2005 at the XXIIIInd Symposium of the International Society of Biomechanics in Sports. Beijing, China

\***Walsh, M.**, Klein, E., Rouse, J., (2004) The effects of arms and counter movement on vertical jumping of females. Presented August 2004 at the XXIIInd Symposium of the International Society of Biomechanics in Sports. Ottawa, Canada

\*Klein, E., **Walsh, M.** (2004) Changes in ankle angle and muscle activation during cycling to fatigue. Presented August 2004 at the XXIIInd Symposium of the International Society of Biomechanics in Sports. Ottawa, Canada

**Walsh, M.**, Mademli, L. Brueggemann, G.-P., Arampatzis, A. (2004) The effect of submaximal concentric and isometric fatiguing contractions on the compliance of the gastrocnemius medialis tendon and aponeurosis. Presented July 2004 at the 9<sup>th</sup> annual congress of the European College of Sports Science. Clermont-Ferrand, France.

Mademli, L., **Walsh, M.**, Brueggemann, G.-P., Arampatzis, A. (2004) Neuromechanic behaviour of the gastrocnemius medialis muscle tendon unit before, during and after submaximal isometric fatiguing contractions. Presented July 2004 at the 9<sup>th</sup> annual congress of the European College of Sports Science. Clermont-Ferrand, France.

**Walsh, M.** Brueggemann, G.-P. (2001). Kinematic changes at the hip, knee and ankle joints as a result of fatigue during a repetitive stretch-shortening cycle activity. Presented at the Symposium of the European Community of Sports Science: Cologne, Germany.

**Walsh, M.**, Brueggemann, G.-P. (2000). The effects of fatigue on calf muscle electromyography parameters during a stretch shorten cycle activity. Presented at the Symposium of the European Community of Sports Science: Jyvaskyla, Finland.

Arampatzis, A., **Walsh, M.**, Brueggemann, G.-P. (1998). Biomechanical analysis of the long jump at the XI Athletics World Championships in Athens, Greece. Presented at the Symposium of the International Society of Biomechanics in Sports; Konstanz, Germany.

**Walsh, M.** and Kanal, Y.(1997). Measurement of plant pressure during short contact time sports activities. Presented at the Symposium of the International Society of Biomechanics in Sports; Denton, Tx.

**Walsh, M.** and Hall, S. J. (1993). Kinematics of the pole vault approach. Presented at the Symposium of the International Society of Biomechanics in Sports; Amherst, Ma. (**Winner of the ISBS Young Researcher Award**).

**b. National/Regional**

Teresa Schwendler & Mark Walsh,(2014). Analysis of Vitamin A Adequacy of Nepalese Trekking Guides During a 13 Day Trek. Presented at the Miami University undergraduate research forum.

Venis K, Feczer R, Smith DL, Walsh MS, Haug MJ, Slattery EW, Blasi S. (2014) Effect of posture on a head repositioning and ‘head still’ task

\*Adam J. Strang, James Smart, Erin Harper, **Mark Walsh** (2011). Postural control developed to facilitate target shooting for stance on a dynamic surface. Presented at Progress in Motor Control VIII, Cincinnati, USA

Adam J. Strang\*, Joshua Haworth<sup>‡</sup>, Mathias Hieronymus<sup>‡</sup>, **Mark Walsh<sup>‡</sup>**, and L. James Smart, Jr.\* (2001). Exploring the Use of Recurrence Quantification Analysis for Identifying Dynamic Patterns in Postural Coordination: The Effects of Vision and Support Surface.

P. Bide, K. Padfield, C. Ansberry, A. Behm, **M. Walsh** (2008). “Does fatigue affect valgus alignment at the knee during a drop jump task?” Presented at the Midwest ACSM meeting

Smith. D.L., **Walsh, M.**, & Smith, J.P. (2007). The effect of chiropractic adjustments on locomotion in a patient with xeroderma pigmentosum. Association of Chiropractic Colleges (ACC) meeting and the Research Agenda Conference (RAC), Phoenix, AZ.

\*Meredith Winkler, Melanee Wood, Josh Haworth, **Mark Walsh** (2007). The Effect of a Jumping and Shuttle Run Fatigue Protocol on Drop Jump Kinetics. Presented at the North East Meeting of the American Society of Biomechanics, Maryland.

\*Josh Haworth, Kathy Krummen, Meredith Winkler, **Mark Walsh** (2007) The Effect of the Menstrual Cycle Hormones on Jump Kinematics. Presented at the North East Meeting of the American Society of Biomechanics, Maryland.

\*Meredith Winkler, Josh Haworth, **Mark Walsh** (2007) Are The Effects of Fatigue On Injury Risk Factors Gender Specific. Presented at the North East Meeting of the American Society of Biomechanics, Maryland.

Murdock, L., Waters, J., Broers, K., **Walsh, M.** (2006). Age related differences in running economy. Presented at the Southeast Biomechanics Conference at the Georgia Institute of Technology in Atlanta, Georgia. Atlanta, Georgia.

Wojcik, J., Sweeney, C., Young, B., **Walsh, M.** (2006). Rugby sprint specific kinematics. Presented at the Midwest Graduate Student Biomechanics Symposium at the University of Wisconsin-Milwaukee.

Penko, A., Carver, R., Creekmur, C., **Walsh, M.** (2006). The effect of instructions on jump parameters in NCAA division I basketball players. Presented at the Southeast Biomechanics Conference at the Georgia Institute of Technology in Atlanta, Georgia. Atlanta, Georgia.

Jones, M., Carver, R., Penko, A., **Walsh, M.** (2006). Do hip strength differences between genders play a role in the incidence of knee injury. Presented at the Southeast Biomechanics Conference at the Georgia Institute of Technology in Atlanta, Georgia. Atlanta, Georgia.

Young, B., Sweeney, C., Wojcik, J., **Walsh, M.** (2006). The effect of carrying the ball on sprint times:skilled vs unskilled players. Presented at the Southeast Biomechanics Conference at the Georgia Institute of Technology in Atlanta, Georgia. Atlanta, Georgia.

Jones, M. Salzer, K. Carver, R. Broers, K. Creekmur, C. **Walsh, M.** (2005) Kinematic changes in landings of fatigued females: Possible injury considerations. Presented at the Midwest American College of Sports Medicine conference, at Muncie, Indiana, September 30.

Creekmur, C. Broers, B. Salzer, K. Carver, R. Jones, M. **Walsh, M.** (2005) Kinetic changes in landings of fatigued females: Possible injury considerations. Presented at the Midwest American College of Sports Medicine conference, at Muncie, Indiana, September 30.

Klein, E., **Walsh, M.**, Cox, R. (2004). The Effect of Cycling Style on Physiological Parameters in College Aged Competitive Cyclists. Presented Nov. 2004 at the Midwest ACSM meeting in Lafayette, Indiana

a. Invited lecturer

Walsh, M. (2011) Organizing Study Abroad Workshops. Invited Speaker at the 82<sup>nd</sup> annual OAHPERD Convention, Columbus, Ohio

Walsh, M (2010) Changing the way we think about and analyze postural coordination: methodological and practical implications. Invited to present research on nonlinear measures of balance at the 15<sup>th</sup> Annual Congress of the European College of Sports Science. Antalya, Turkey 2010.

Walsh, M (2010) Teaching Online, Practical Implications. Invited speaker at the XXVIII Symposium of the International Society of Biomechanics in Sports, Michigan, USA

Walsh, M. (2002) ‘The use of elastic energy in sports’  
Presented at the Midwest American college of Sports Medicine meeting, Dearborn, Michigan, September 2002.

Walsh, M. (2002) “Analyzing electromyographical data and mechanical vibrations by means of wavelets”.  
Presented as part of a seminar for doctoral students of biomechanics at the German Sports University in Cologne, Germany, March, 2002.

## B. Research Grants

### a. External(B4)

#### i. Grants applied for

Walsh, M.. Waters, J (2005) AREA Grant

Title of grant proposal ‘manipulation of mechanical efficiency of runners who experience joint discomfort’

Did not receive

Walsh, M (2005). Research grant from the international Rugby Board

Title: Title: Evaluation of the loads to the lower extremity during open play in rugby union

Did not receive

Waters, J. Walsh, M. (2005) SBIR

Title: Creating a neural network to be used as a therapy tool for people with joint discomfort while running

Did not receive

#### ii. Other external funding

**Louisville Slugger (LS) (2013-2014) Was mentor for a Fyre (First Year Research Experience) group of engineering/business students. Developed a project, visited LS in Kentucky, the students pitched our idea to the LS management and LS is currently sponsoring our project.**

### b. (Internal)

#### i. applied for and received

Walsh, M. (2003) Fatigue induced changes in muscle tendon function. Office for the Advancement of Scholarship and Teaching summer research appointment and Grant to Promote Research for \$2000 plus \$6200 salary for 8 weeks full time work.

(resulted until now in 1 article published article, 2 manuscripts in preparation and 3 international peer reviewed presentations)

Walsh, M. (2003). Gender differences in biomechanical parameters caused by fatigue during a stretch-shortening cycle activity. Education and Allied Professions research support grant. (\$400)

(resulted in 1 peer reviewed journal article)

Walsh, Mark (2005) Rugby specific sprinting at the university club level. EAP small research grant (\$691) (resulted in 1 peer reviewed journal article)

Walsh M (2007) The effect of neuromuscular training on balance and strength. EAP summer research grant. Funded \$5,000

Walsh, M., Singh, K (2009) Remote Identification in Human Fatigue and Jump environment. CFR grant to support research and a GA position

Walsh, Mark (2011) Electromyographic activation patterns in the hamstring muscles during typical rehabilitation exercises. EAP small research grant (\$1291)

Walsh, Mark (2012) The effect of footedness on balance performance. A novel approach to analyze human performance. (\$1880)

ii. applied for did not receive

Walsh, M., Waters, J. (2006) Age related changes in joint comfort during movement: manipulating joint movement characteristics to allow for comfortable movement. Miami University Research Incentive Grant. (\$50,000)