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Applied Physiology and Kinesiology
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Curriculum Vitae

ACADEMIC AND PROFESSIONAL APPOINTMENTS

Education:

1983-87	B.A., Biophysics, Wellesley College, Wellesley, MA
1990-96	Ph.D., Physiology and Biophysics, University of Washington, Seattle, WA

Postgraduate Training and Fellowship Appointments:

1997-99	Department of Physiology, University of Pennsylvania, Philadelphia, PA

Faculty Appointments:

2000-03	Instructor, Department of Physiology, University of Pennsylvania, Philadelphia, PA
2003-10	Assistant Professor, Department of Anatomy and Cell Biology, University of Pennsylvania, Philadelphia, PA
2010-14	Associate Professor, Department of Anatomy and Cell Biology, University of Pennsylvania, Philadelphia, PA
2014	Interim Chair, Department of Anatomy and Cell Biology, University of Pennsylvania, Philadelphia, PA
2015 -	Professor, Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL

Awards, Honors and Membership in Honorary Societies:

1993	Sigma Xi, Grant-in-Aid of Research, 1993.
1993-96	National Institutes of Health, Graduate Neuroscience Fellowship.

1997-99	Muscular Dystrophy Association, Harry Zimmerman Neuromuscular Disease Named-Research Fellowship
2003, 2011	Penn Dental Rabinowitz Award for Excellence in Research
2013-15	Penn Fellow, University of Pennsylvania
2014	Penn Dental Basic Science Excellence in Teaching Award

BIBLIOGRAPHY

Research Publications:

Barton-Davis, E.R., R.W. Wiseman, and M.J. Kushmerick. (1992) Intracellular pH and inorganic phosphate effects on skeletal muscle force. *Bulletin of Magnetic Resonance*, 14(1--4): 122 - 125.

Barton-Davis, E.R., W.A. LaFramboise, and M.J. Kushmerick. (1996) Activity-dependent induction of slow myosin in fast-twitch mouse muscle. *Am. J. Physiology Cell*, 271: C1409 - C1414.

Barton-Davis, E.R., D.I. Shoturma, A. Musaro, N. Rosenthal, and H.L. Sweeney. (1998) Viral mediated expression of insulin-like growth factor I blocks the aging-related loss of skeletal muscle function. *PNAS*, 95(26): 15603 - 15607.

Barton-Davis, E.R., L. Cordier, D.I. Shoturma, S.E. Leland and H.L. Sweeney. (1999) Aminoglycoside antibiotics restore dystrophin function to skeletal muscles of *mdx* mice. *J. Clinical Investigation*, 104(4): 375 - 381.

Barton-Davis, E.R., D.I. Shoturma and H.L Sweeney. (1999) Contribution of satellite cells to IGF-I induced hypertrophy of skeletal muscle. *Acta Physiologica Scandinavica* , 167(4): 301 - 305.

Cordier, L.L., A.A. Hack, M.O. Scott, **E.R. Barton-Davis**, G.-P. Gao, J.M. Wilson, E.M. McNally, and H.L. Sweeney. (2000) Rescue of skeletal muscles of gamma-sarcoglycan deficient mice with AAV-mediated gene transfer. *Molec.Therapy*, 1(2): 119 – 129.

Walter, G., **E.R. Barton** and H.L. Sweeney. (2000) Noninvasive measurement of gene expression in skeletal muscle. *PNAS*, 97(10): 5151 – 5155.

Musaro, A., C.K. McCullagh, L. Houghton, **E.R. Barton,** H.L. Sweeney, and N. Rosenthal. (2001) Localized IGF-I transgene expression sustains hypertrophy and regeneration in senescent skeletal muscle. *Nature Genetics*, 27(2): 195 – 200.

Barton, E.R., L. Morris, A. Musaro, N. Rosenthal and H.L. Sweeney. (2002) Muscle specific expression of Insulin-like Growth Factor I counters muscle decline is *mdx* mice. *J. Cell Biology*, 157 (1): 137-147.

Bogdanovich, S., T.O.B. Krag, **E.R. Barton**, L.D. Morris, R.S. Ahima, and T.S. Khurana. (2002) Myostatin blockade improves muscle function in *mdx* mice. *Nature*. 420(6914): 418-421.

Mu, J., **E.R. Barton,** and M. J. Birnbaum (2003) Selective Suppression of AMPK in Skeletal Muscle: Update on "Lazy Mice". *Biochem. Soc. Trans.,* 31(Pt 1): 236-241.

Barton, E.R. and H.L. Sweeney. (2003) Analysis of telomere length in the aged mdx diaphragm with and without transgenic IGF-I expression. *Basic Appl. Myology*, 13(6): 309-312.

Kobinger G.P., J.P. Louboutin, **E.R. Barton**, H.L. Sweeney, and J.M.Wilson. (2003) Correction of the Dystrophic Phenotype by *In Vivo* Targeting of Muscle Progenitor Cells. *Human Gene Therapy,* 14: 1441–1449.

Lee, S.*, **E.R. Barton***, H.L. Sweeney, and R.P. Farrar (2004) Viral expression of Insulin-like growth factor–I enhances muscle hypertrophy in resistance trained rats. *J. Appl. Physiol.*, 96: 1097–1104, (*, authors contributed equally to this work).

Kim, H., **E. Barton**, N. Muja, S.Yakar, and D. LeRoith. (2005) Biological effects of GH on muscle growth and function are IGF-I – dependent. *Endocrinology*, 146(4): 1772-1779.

Barton, E.R., J.A. Gimbel, G.R. Williams and L.J. Soslowsky. (2005) Rat supraspinatus muscle atrophy after tendon detachment. *J. Orthopaedic Research*. 23(2): 259-265.

Barton, E.R., L. Morris, M. Kawana, L.T.Bish, and T. Toursel. (2005) Systemic administration of L-arginine benefits skeletal muscle function in *mdx* mice. *Muscle and Nerve,* 32(6): 751-760.

Barton, E.R. (2006) Loss of the dystrophin glycoprotein complex impairs mechanical signal transduction in murine skeletal muscle. *Am. J. Physiology Cell*, 290(2): C411-C419.

Barton, E.R. (2006) Viral expression of Insulin-like Growth Factor-I isoforms promotes different responses in skeletal muscle. *J. Appl. Physiol.*, 100: 1778-1784.

Barton, E.R. (2006) The ABC's of IGF-I isoforms: Impact on muscle hypertrophy and implications for repair. *Appl Physiol, Nutrition and Metab.,* 31: 791-797.

Welch, E.M.[#], **E.R. Barton[#],** J. Zhuo, Y. Tomizawa, W.J. Friesen, P. Trifillis, S. Paushkin, M. Patel, C.R. Trotta, S. Hwang, R.G. Wilde, G. Karp, J. Takasugi, G. Chen, S. Jones, H. Ren, Y-C. Moon, D. Corson, A.A. Turpoff, J.A. Campbell, M.M. Conn, A. Khan, N.G. Almstead, J. Hedrick, A. Molin, N. Risher, M. Weetall, S. Yeh, A.A. Branstrom, J.M. Colacino, J. Babiak, W.D. Ju, S. Hirawat, V.J. Northcutt, L.L. Miller, P. Spatrick, F. He, M. Kawana, H. Feng, A. Jacobson, S.W.

Peltz, & H.L. Sweeney. (2007) PTC124 targets genetic disorders caused by nonsense mutations. *Nature*, 447 (7140): 87-91. (# The first two authors contributed equally to this work).

Daniels, D.W., Z. Tian, and **E.R. Barton**. (2008) Sexual dimorphism of murine masticatory function. *Arch. Oral. Biol.,* 53(2): 187-192.

Millay D.P., M.A. Sargent, H. Osinska, C.P. Baines, **E.R. Barton**, G. Vuagniaux, H.L. Sweeney, J. Robbins, J.D. Molkentin. (2008) Genetic and pharmacologic inhibition of mitochondrial-dependent necrosis attenuates muscular dystrophy. *Nat Med.,* 14(4): 442-447.

Evans M, K. Morine, C. Kulkarni, and **E.R. Barton**. (2008) Expression profiling reveals heightened apoptosis and supports fiber size economy in the murine muscles of mastication. *Physiol. Genomics*, 35 (1): 86-95.

Pfeffer, L.A., B.K. Brisson, H. Lei, and **E.R. Barton**. (2009) The insulin-like growth factor-I E-Peptides modulate cell entry of the mature IGF-I protein. *Mol. Biol Cell*, 20 (17): 3810–3817.

Ostrovsky O., D. Eletto, C. Makarewich, **E.R. Barton**, and Y. Argon. (2010) Glucose regulated protein 94 is required for muscle differentiation through its control of the autocrine production of insulin-like growth factors. *Biochim Biophys Acta*, 1803(2): 333-4.

Barton, E.R., J. DeMeo, and H. Lei (2010) Insulin-like growth factor (IGF)-I E peptides are required for isoform specific gene expression and muscle hypertrophy after local IGF-I production. *J. Appl Physiol.,* 108(5):1069-76. (*Editorial Comment in J Appl Physiol 108: 1032-1033, 2010).*

Morine, K.J., L.T. Bish, K. Pendrak, M.M. Sleeper, **E.R. Barton**, and H.L. Sweeney. (2010) Systemic myostatin inhibition via liver-targeted gene transfer in normal and dystrophic mice. *PloS One*, 5(2): e9176.

Barton, E.R., B.J. Wang, B.K. Brisson, and H. L. Sweeney. (2010) The diaphragm displays early and progressive functional deficits in dysferlin deficient mice. *Muscle and Nerve*. 42(1):22-9.

Barton, E.R. (2010) Restoration of gamma-sarcoglycan localization and mechanical signal transduction are independent in murine skeletal muscle. *J. Biol Chem.* 285(22): 17263-70.

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Qaisar R., G. Renaud, K. Morine, **E.R. Barton,** H.L. Sweeney L. Larsson. (2012) Is functional hypertrophy and specific force coupled with addition of myonuclei at the single muscle fiber level? *Faseb J*, 26(3):1077-8.

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Barton E.R., J.K. James, S. Park, C. Makarewich, A. Philippou, H. Lei, B. Brisson, D. Eletto, O. Ostrovsky, Z. Li and Y. Argon. (2012) Deletion of muscle GRP94 impairs both muscle and body growth by inhibiting local IGF production. *Faseb J*. 26(9): 3691-3702.

Brisson B.K. and **E.R. Barton.** (2012) Insulin-like growth factor E-peptide activity is dependent on the IGF-I receptor. *PLoS One*. 7(9):e45588.

Hong P., K. Chen, B. Huang, M. Liu, M. Cui, I. Rozenberg, B. Chaqour, X. Pan, **E.R. Barton**, X.C. Jiang, M.A. Siddiqui. (2012) HEXIM1 controls satellite cell expansion after injury to regulate skeletal muscle regeneration. *J. Clin Invest* 122(11):3873-87.

Moorwood, C., M. Liu, Z. Tian, and **E.R. Barton** (2013). Isometric and eccentric force generation assessment of skeletal muscles isolated from murine models of muscular dystrophies. *JoVE.* (71). doi:pii: 50036. 10.3791/50036.

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Durzynska, J., A. Philippou, B.K. Brisson, M. Nguyen-McCarty, **E.R. Barton**. (2013) The pro-Forms of Insulin-Like Growth Factor I (IGF-I) Are Predominant in Skeletal Muscle and Alter IGF-I Receptor Activation. *Endocrinology.* 154(3):1215-24.

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Xu C, M. Tabebordbar, S. Iovino, C. Ciarlo, J. Liu, A. Castiglioni, E. Price, M. Liu, **E.R. Barton**, C.R. Kahn, A.J. Wagers, L.I. Zon. (2013) A Zebrafish Embryo Culture System Defines Factors that Promote Vertebrate Myogenesis across Species. *Cell.* 155(4): 909-21.

Zou, Y., D. Zwolanek, Y. Izu, S. Gandhy, G. Schreiber, K. Brockmann, M. Devoto, Z. Tian, Y. Hu, G. Veit, M. Meier, J. Stetefeld, D. Hicks, V. Straub, N.C. Voermans, D.E. Birk, **E.R. Barton**, M. Koch, C.G. Bonnemann. (2014) Recessive and dominant mutations in COL12A1 cause a novel EDS/myopathy overlap syndrome in human and mice. *Hum Mol Gen*, 23(9):2339-52..

Park, S., B.K. Brisson, M. Liu, J.M. Spinazzola, **E.R. Barton**. (2014) Mature IGF-I excels in promoting functional muscle recovery from disuse atrophy compared to pro-IGF-IA. *J. Appl Physiol*, 116(7): 797-806.

Brisson, B.K., S. Park, **E.R. Barton**. (2014) Viral expression of Insulin-like Growth Factor-I E-peptides increases skeletal muscle mass but at the expense of strength. *Am. J. Physiol. Endo,* 306 (8): E965 – 74.

Forbes S.C., L.T. Bish, F. Ye, J. Spinazzola, C. Baligand, D. Plant, K. Vandenborne, **E.R. Barton**, H.L. Sweeney, G.A. Walter. (2014) Gene transfer of arginine kinase to skeletal muscle using adeno-associated virus. *Gene Ther*. 21(4):387-392.

Moorwood, C., and **E.R. Barton.** (2014) Caspase-12 ablation rescues muscle function in the *mdx* mouse. *Hum Mol Gen*, 23(20): 5325-41.

Smith, L.R. and **E.R. Barton**. (2014) Collagen content does not contribute to passive mechanics properties in fibrotic skeletal muscle of *mdx* mice. *Am J. Physiol Cell*, 306 (10): C889-898.

Moorwood, C., T. Philippou, J. Spinazzola, B. Keyser, E.J. Macarak, and **E.R. Barton.** (2014) Absence of γ-sarcoglycan alters the response of p70S6 kinase to mechanical perturbation in murine skeletal muscle. *Skeletal Muscle*, 4: 13.

Altamirano F, Perez CF, Liu M, Widrick J, **Barton ER**, Allen PD, Adams JA, Lopez JR. (2014) Whole body periodic acceleration is an effective therapy to ameliorate muscular dystrophy in mdx mice. *PLoS One*. 9(9):e106590.

Ceco E, S. Bogdanovich, B. Gardner, T. Miller, A.DeJesus, J.U. Earley, M. Hadhazy, L.R. Smith, **E.R. Barton**, J.D. Molkentin, E.M. McNally. Targeting latent TGFβ release in muscular dystrophy. *Sci Transl Med*. 2014 Oct 22; 6(259): 259ra144.

Smith, L.R. and **E.R. Barton** (2014) SMASH - Semiautomatic muscle analysis using segmentation of histology: a MATLAB application. *Skeletal Muscle*, **4**: 21.

Spinazzola, J.M, T.C. Smith, M. Liu, E.J. Luna, and **E.R. Barton** (2015) Gamma-sarcoglycan is required for the response of archvillin to mechanical stimulation in skeletal muscle. *Hum Mol Gen*, 24(9):2470-81.

Philippou, A., F. Minozzo, L.R. Smith, H. Lei, D. Rassier, and **E. R. Barton**. (2015) Masticatory muscles of mouse do not undergo atrophy in space. *FASEB Journal*, 29(7):2769-79.

Di Rocco A. , K. Uchibe, C. Larmour, R. Berger, M. Liu, **E.R. Barton**, M. Iwamoto. (2015) Selective Retinoic Acid Receptor γ Agonists Promote Repair of Injured Skeletal Muscle in Mouse. *Am J Pathol*. 2015 Jul 21. [Epub ahead of print].

Lee Y.S., A. Lehar, S. Sebald, M. Liu, K.A. Swaggart, C.C. Talbot Jr, P. Pytel , **E.R. Barton**, E.M. McNally, S-J. Lee. (2015) Muscle hypertrophy induced by myostatin inhibition accelerates degeneration in dysferlinopathy. *Hum Mol Genet*. 2015 Jul 23. [Epub ahead of print]

Smith, L.R., D.W., Hammers, H.L. Sweeney, **E.R. Barton**. Increased Collagen Cross-linking is a Signature in Dystrophinopathic Muscle. *Muscle & Nerve*, under revision.

Editorials, Reviews, Chapters:

Prockop, D. J., A. Olsen, S. Kontusaari, J. Hyland, L. Ala-Kokko, N.S. Vasan, **E. Barton**, S. Buck, K. Harrison, R. L. Brent. (1990) Mutations in human procollagen genes. *Annals of New York Academy of Sciences*, 580: 330 - 339.

Sweeney, H.L. and **E.R. Barton**. (2000) The dystrophin-associated glycoprotein complex: What parts can you do without? *PNAS*, 97 (25): 13464-13466.

Barton, ER and CA Morris. (2003) Mechanisms and Strategies to Counter Muscle Atrophy. *Journal of Gerontology: Medical Sciences*, 58A(10): 923-926.

Barton, E.R. "Craniofacial musculature" in Craniofacial Growth and Development J.J. Mao and H-D Nah, eds. Blackwell Munksgund Publishing BM Record Number: 081318648•9780813818641; 2010.

Barton E.R., G. Lynch, and T.S. Khurana. (2008) Measuring isometric force in isolated mouse muscles in vitro. TREAT-NMD Activity A07: Accelerate preclinical phase of new therapeutic treatment development. SOP ID M.1.2_002. (http://www.treat-nmd.eu/userfiles/file/general/Isometric_force_in_vitro.pdf).

Barton, E.R. and C. Crowder. (2010) Growth factors and success of orthodontic treatment. *Seminars in Orthodontics.* 16(2):128-134.

Barton E.R. and A. Philippou. (2010). Comments on Point: Counterpoint: IGF is/is not the major physiological regulator of muscle mass. *J Appl Physiol.* 108(6): 1827-8.

Barton, ER (2012). Mechanical Signal Transduction: Divergent Communication and the Potential Consequences for Masticatory Muscle. *Seminars in Orthodontics.* 18(1):2-9.

Barton, E.R. (2012) Insulin-Like Growth Factor I Regulation and Its Actions in Skeletal Muscle Growth and Repair, *Muscle*. Eds. Hill and Olson, Elsevier.

Brisson B.K. and **E.R. Barton.** (2013) New modulators for IGF-I activity within IGF-I Processing Products. *Front Endocrinol (Lausanne)* 4:42.

Philippou, A and **E.R. Barton** (2014) Optimizing IGFI for skeletal muscle therapeutics. *Growth Hormone and IGF-I Research*, 24 (5): 157-63.

Bikle, D. D, C. Tahimic, W. Chang, Y.Wang, A. Philippou, and **E. R. Barton**. Role of IGF-I Signaling in Muscle Bone Interactions. *BONE*, accepted, in press.

Barton, E.R. Hierarchy of Insulin-like Growth Factor I Bioavailability Regulation in Skeletal Muscle.[1]*Mol Endocrinol*, under review.

Alternative Media:

Sokolove, M. The Lab Animal January 18, 2004, *New York Times Sunday Magazine*. Article which features mice expressing high levels of IGF-I and the work described in Barton et al, *J. Cell Biol*, 2002, and Lee and Barton et al, *J. Appl. Physiol*, 2004.

Prime Time May 13th, 2004. ABC. Television interview to discuss the impact of gene therapy on athletic gene doping.

"Life Beyond Limits" May 9, 2004. CNN. Television interview to describe the biology behind increasing muscle mass and strength.

RESEARCH SUPPORT

Active:

DOD MD130059 (Barton) 7/1/14 – 10/30/16
Development of Orally Bioavailable Therapeutics by the Chloroplast Expression System to Counter Muscle Degeneration, Weakness, and Fibrosis in DMD
The goal of this study is to identify therapeutic candidates for the muscular dystrophies with novel delivery system.

U54 AR052646 (PI Sweeney) 9/1/05 – 7/31/20
NIH/Muscular Dystrophy Cooperative Research Center
Physiological Assessment Core (Barton, Core director)
This core provides sensitive and repeatable physiological assessments of muscle function needed for evaluation of potential therapeutics (pharmacological, gene or cell therapies) in mouse models of muscular dystrophy.

R01 AG018001 (PI Argon) 7/1/14 – 6/30/17
Regulation of IGF levels in Development and Aging
Co-Investigator (Yrs 3-5)
The goal of this grant are to identify alterations in GRP94 activity in the human population and its regulation of IGF production.

Completed:

R01 AR057363 (Barton) 7/1/10 – 6/30/15
Modulation of Muscle Regeneration by Growth Factors
The goals of this grant are (1) to determine if matrix metalloproteinase 13 (MMP-13) can accelerate proper resolution of muscle damage associated with genetic disease and after acute injury, and (2) to understand the functional links between insulin-like growth factor I, the E peptides and MMP-13 activity.

R01 AR059685 (PI Lee) 7/1/10 – 6/30/15
Mechanisms underlying myostatin regulation and activity
Co-Investigator
The goal of this study is to identify additional ligands of the TGF-beta superfamily that modulate muscle mass and function through the activin IIB receptor. These may serve as new therapeutic targets for muscle disease.

SRA (Barton) 12/1/12 – 5/30/14
Alexion Pharma International
Functional evaluation of the AKP2-/- mouse model

The goal of this study is to determine if there is a muscular defect in mice lacking AKP2.

SRA (Barton) 9/1/12 – 8/31/13
Shire HGT
In vivo preclinical studies of PLGF testing
The goal of this sponsored research agreement is to evaluate the therapeutic potential of vascularizing agents in the muscular dystrophies.

P01 HD059751 (Vandenborne) 9/30/09 – 8/31/12
Therapeutic strategies to augment muscle rehabilitation
P.I., Project 2
The goals of this grant are to identify the best IGF-I isoform to restore atrophic muscle following unloading and contusion spinal cord injury.

NNX09AH44G (Barton) 5/01/09 – 4/30/11
National Aeronautics and Space Administration
"Identification of mechano-sensors to protect against skeletal muscle atrophy" Role: P.I.
The goal of this grant is to determine the signaling role of the dystrophin glycoprotein complex in sensing mechanical strain in skeletal muscle.

P50 DK052620 (Chacko) 9/30/09 – 8/31/11
Bladder wall remodeling in LUTS
Role: P.I., Pilot and feasibility project
"Enhancing endogenous satellite cell activity in the striated sphincter to prevent incontinence"
Evaluate the therapeutic potential of targeted viral delivery of IGF-I to the striated urethral sphincter for the treatment of urinary incontinence, and to compare this strategy with delivery of syngenic myoblasts to the same tissue.

R21 AR056480 (Barton) 2/26/08-1/31/10
IGF-I isoforms: a source for new agents to counter muscular dystrophy pathology
The major goal of this project is to identify new therapeutic peptides from the IGF-I gene for the muscular dystrophies.

R03 AR050160 (Barton) 7/1/04 – 6/30/07
Enhancing Recovery of Muscle after Rotator Cuff Repair
The goal of this project is to determine if IGF-I can boost the regenerative capacity of muscle following rotator cuff tendon detachment and re-attachment.

American Heart Association (Barton) 7/1/02 – 6/30/06
Role of Sarcoglycans as Mechanical Sensors for Muscle

The goal of this project is to identify the proteins involved in mechanical signal transduction in skeletal muscle.

Parent Project for Muscular Dystrophy (Barton) 7/1/04 – 4/30/06
Targeting Protein Degradation to Counter Muscle Loss in Muscular Dystrophy
The goal of this project is to evaluate proteasome inhibitors as a potential therapy for the muscular dystrophies.

University Research Foundation (Barton) 7/1/03 – 6/30/04
Role of IGF-I Isoforms in Promoting Muscle Hypertrophy
The goal of this project is to compare IGF-I isoforms in skeletal muscle.

Muscular Dystrophy Association (Barton) 1/1/01 – 8/31/03
Role of Dystrophin Complex in Mechanical Signal Transduction
The goal of this project is to determine if the dystrophin complex mediates mechanical signaling.

LECTURES BY INVITATION

March 1999 "Viral mediated expression of insulin-like growth factor I blocks the aging-related loss of skeletal muscle function." Myogenic Pathways in Embryogenesis, Regeneration, and Neoplasia, Philadelphia, PA.

August 1999 "Aminoglycoside antibiotics restore dystrophin function to skeletal muscles of *mdx* mice." Northwest Gordon Conference, Friday Harbor, WA.

October 1999 "Applications of gene therapy to aging skeletal muscle." Pennsylvania State University, State College, PA.

September 2000 "Functional hypertrophy of muscle induced by viral transfer of IGF-I." American Physiological Society Conference on The Integrative Biology of Exercise, Portland, ME.

June 2002 "Mechanisms & Strategies to Counter Muscle Atrophy." Kronos Symposium, San Diego, CA.

July 2003 "Viral Administration **of** IGF-I mediates hypertrophy in the selective absence of Akt isoforms." Skeletal Muscle Satellite and Stem Cells, FASEB Summer Research Conference, Tuscon, AZ.

September 2003 "Constituents of gentamicin promote nonsense suppression

and restoration of dystrophin function in mdx mice." European Muscle Conference 2003, Montpellier, France.

April 2004 "IGF-I mediated hypertrophy in the selective absence of Akt." Pennsylvania Muscle Institute Twelfth Annual Retreat and Symposium, Philadelphia, PA.

June 28, 2004 "Effect of rotator cuff tears on muscle properties." Musculoskeletal Disorders Center Retreat, University of Pennsylvania, Philadelphia, PA.

December 4, 2004 "The IGF-I signaling pathway and muscle regeneration." American Society for Cell Biology, Washington, DC.

September 27, 2005 " Premature stop codon suppression: a potential therapy for genetic disease." St. Christopher Hospital, Philadelphia, PA.

November 10, 2005 " IGF-I isoforms: Impact on muscle hypertrophy, Implications for muscle repair." Canadian Society for Exercise Physiology, Gatineau, Quebec, Canada.

February 6, 2006 "Physiological assessment core: Role and responsibilities." Wellstone Center Face-to-Face Meeting, Pittsburgh, PA.

April 25, 2006 "Viral expression of IGF-IB drives proliferation at the expense of hypertrophy in *mdx* skeletal muscle." New Directions in Biology and Disease of Skeletal Muscle, Dallas, TX.

June 23, 2006 "Expression profiling of murine masseter reveals unique features of craniofacial muscle." School of Dental Medicine Annual Research Retreat, Bryn Mawr, PA.

July 15, 2006 "IGF-I: potential and existing therapies." Parent Project for Muscular Dystrophy Annual Meeting, Cincinnati, OH.

November 29, 2006 "What's load got to do with it? A new molecular signature for masticatory muscle." Penn Dental seminar series.

March 21, 2007 "The E-peptide extensions of IGF-I isoforms modulate cell entry of the mature protein." Gordon Research Conference, Insulin-like Growth Factors in Physiology and Disease, Ventura, CA.

October 27, 2007 "Isolated muscle function as a tool for evaluating therapies in the *mdx* mouse." Clinical Trials Workshop for the Muscular Dystrophies, Washington, DC.

March 6, 2008 "The molecular signature for masticatory muscle: not an open and shut case." New York University Dental School Seminar Series, New York, NY.

March 18, 2008 "Emerging therapies for muscular dystrophy." Franklin County Medical Society Seminar, Chambersburg, PA.

June 30, 2008 "Development of standard operating procedures for isolated muscle function in the *mdx* mouse." Treat Neuromuscular Disease (NMD) Workshop, Zurich, Switzerland.

September 12, 2008 "Development of animal models for Temporomandibular Joint Disorder." Oral Medicine Seminar, University of Pennsylvania School of Dental Medicine.

November 5, 2008 "The IGF-I isoforms: a source for new agents to enhance skeletal muscle repair." Georgia Tech School of Applied Physiology Seminar Series, Atlanta, GA.

January 14, 2009 "Strategies for understanding and enhancing masticatory muscle function." Eastman Dental Insitute, University College London, London, UK.

March 17, 2009 "Nonsense suppression by PTC124: a new strategy for genetic disease therapy." 82nd Annual Meeting of the Japanese Pharmacological Sociaty, Yokohama, Japan.

April 28, 2009 "Emerging new functions of the IGF-I isoforms." University of Texas Health Science Center at San Antonio, San Antonio, TX.

June 26, 2009 "The therapeutic potential of IPLEX for Duchenne Muscular Dystrophy." Parent Project for Muscular Dystrophy Annual Meeting, Atlanta, GA.

June 30, 2009 "Physiological assessment core: Annual progress report." Wellstone Center Face-to-Face Meeting, Iowa City, IA.

July 8, 2009 "Potential therapies for congenital muscular dystrophies derived from the IGF-I isoforms." Cure CMD Meeting, Atlanta, GA.

April 15, 2010 "New functions of the IGF-I isoforms in muscle" Institut Myologie, Paris, France.

May 7, 2010 "Muscle specific ablation of chaperone protein GRP94 blocks IGF-I mediated muscle growth" New Directions in Muscle Biology and Disease, Ottawa, ON, Canada.

May 19, 2010. "Harnessing the power of the IGF-I isoforms for muscle repair. Suny Downstate, Brooklyn, NY.

October 2010. "ER chaperone GRP94 depletion in skeletal muscle reduces muscle and organismal growth through inhibition of IGF-I production." 5th International Congress of the GRS and IGF Society, New York, NY.

September 2011. "Matrix metalloproteinase 13 (MMP13) is necessary for myoblast maturation and muscle regeneration." 40th European Muscle Conference, Berlin, Germany.

September 2011. "Muscle production of IGF-I contributes to both paracrine and endocrine actions: a matter of form and function." Molecular Mechanicsms of Muscle Growth and Wasting in Health and Disease, Ascona, Switzerland.

October 17, 2011. "Importance of muscle IGF-I for organismal growth." Annual Pennsylvania Muscle Institute Symposium, Philadalphia, PA

November 4, 2011, "Muscle production of insulin-like growth factor I, a matter of form and function." Department of Molecular Biomedical Research Seminar Series, University of Ghent, Belgium.

March 6, 2012. "Physiological strategies to evaluate emerging therapies for muscular dystrophy." Shire HGT, Waltham, MA.

March 16, 2012. " "*Will the real IGF-I please stand up?"* Unraveling the functions of insulin-like growth factor I isoforms." Department of Physiology Seminar Series, University of Illinois at Chicago, Chicago, IL.

September 3, 2012 "The pro-forms of insulin-like growth factor I (IGF-I) are predominant in skeletal muscle and alter IGF-I receptor activation." 41st European Muscle Conference, Rhodes, Greece.

November 14, 2012 "The Pros and Cons of Sugar-free IGF-I for Muscle". Department of Physiology Seminar Series, University of Kentucky, Lexington, KY.

March 20, 2013 "IGF-I Anabolic Actions in Skeletal Muscle" IGF-I Gordon Conference, Ventura, CA.

January 31, 2014 "Optimization of IGF-I for Muscle Therapeutics". Department of Applied Physiology and Kinesiology Seminar Series, University of Florida, Gainesville, FL.

April 8, 2014 "Muscle-Bone interactions" Orthopedics Seminar Series, University of Pennsylvania, Philadelphia, PA.

March 24, 2015 "Load Sensors in Skeletal Muscle" Department of Physiological Sciences Seminar Series, College of Veterinary Medicine, University of Florida, Gainesville, FL.

Memberships in Professional and Scientific Societies:

American Society for Cell Biology
American Physiological Society
Biophysical Society

Organizing Roles in Scientific Meetings:

14th Annual Pennsylvania Muscle Institute Retreat November 7, 2005. "Cell-Cell Signaling: Impact on Muscle Development". Primary Scientific Organizer

New Directions in Biology and Disease of Muscle June 2012. Session Organizer.

Editorial Positions:

Reviewer:

Journals:

Muscle and Nerve
Respiratory Research
Human Molecular Genetics
Journal Biological Chemistry
Experimental Cell Research
Aging Cell
Journal of Clinical Investigation
Tissue Engineering
Neuromuscular Disorders
Acta Pharmacologica Sinica
Archives of Oral Biology
FASEB Journal
Journal of Dental Research
American Journal of Physiology: Cell
PLos One
Skeletal Muscle

Funding Agencies:

National Institutes of Health, SMEP ad hoc member
Veterans Administration, Tissue Regeneration section
Muscular Dystrophy Association Venture Philanthropy
Muscular Dystrophy Association Medical Advisory Committee
Muscular Dystrophy Association Clinical Research
Association Française contre les Myopathies
Swiss National Science Foundation
Dutch Duchenne Muscular Dystrophy Foundation

Parent Project for Muscular Dystrophy
Italian Telethon
Natural Sciences and Engineering Research Council of Canada