

CURRICULUM VITAE

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EDUCATION

Degrees:

2010 Ph.D. in Kinesiology (Biomechanics), University of Calgary  
Title: Force production in lengthened myofibrils and single sarcomeres.  
1982 B.Sc. in Biological Sciences, University of Calgary

AWARDS

- 2012 Western Association of Graduate Schools award for Innovative Technology in Research, Fort Collins, CO, USA.
- 2011 J. B. Hyne Research Innovation Award, Faculty of Graduate Studies, University of Calgary.
- 2008 New Investigator Award (Ph.D. category), Canadian Society for Biomechanics.
- 15th CSB Biennial Conference, and NACOB, Ann Arbor, Michigan, USA. August 5-9th, 2008.
- 2004 New Investigator Award (M.Sc. category), Canadian Society for Biomechanics.
- 13th CSB Biennial Conference, Halifax, Nova Scotia, Canada. August 4-7th, 2004.

PUBLISHED MANUSCRIPTS IN PEER REVIEWED SCIENTIFIC JOURNALS

**2021**

Joumaa V, Smith IC, Fukutani A, Leonard TR, Ma W, Mijailovich SM, Irving TC, Herzog W.  
Effect of Active Lengthening and Shortening on Small-Angle X-ray Reflections in Skinned Skeletal Muscle Fibres. *Int J Mol Sci*. 2021 Aug 8;22(16):8526.

**2020**

Eng Kuan Moo, Timothy R. Leonard, and Walter Herzog. The sarcomere force-length relationship in an intact muscle-tendon unit. *Journal of Experimental Biology* 2020: jeb215020.

G. Morais, A. da Rocha, L. Neave, G. Lucas, T.R. Leonard, A. Carvalho, A. da Silva, W. Herzog.  
Chronic uphill and downhill exercise protocols do not lead to sarcomerogenesis in mouse skeletal muscle. *Journal of Biomechanics* Volume 98, 2 January 2020.

## 2019

Atsuki Fukutani, Andrew Sawatsky, Timothy Leonard, Walter Herzog. Contribution of the Achilles tendon to force potentiation in stretch-shortening cycle. *Journal of Experimental Biology*. 2019 222: jeb204032.

Kelly A. Larkin-Kaiser, Jason J. Howard, Timothy Leonard, Venus Joumaa, Luke Gauthier, Karl Logan, Benjamin Orlik, Ron El-Hawary, Walter Herzog. Relationship of muscle morphology to hip displacement in cerebral palsy: a pilot study investigating changes intrinsic to the sarcomere. *Journal of Orthopaedic Surgery and Research*. 14:187 (2019). <https://doi.org/10.1186/s13018-019-1239-1>

Leonard TR, Howard JJ, Larkin-Kaiser K, Joumaa V, Logan K, Orlik B, El-Hawary R, Gauthier L, Herzog W. Stiffness of hip adductor myofibrils is decreased in children with spastic cerebral palsy. *J Biomech*. 2019 Feb 28. doi: 10.1016/j.jbiomech.2019.02.023.

Leumann A, Leonard T, Nüesch C, Horisberger M, Mündermann A, Herzog W. The natural initiation and progression of osteoarthritis in the anterior cruciate ligament deficient feline knee. *Osteoarthritis Cartilage*. 2019 Apr;27(4):687-693.

Fukutani A, Leonard T, Herzog W (2019) Does stretching velocity affect residual force enhancement? *Journal of Biomechanics* 89: 143 -147.

## 2017

E. Moo, T. Leonard and W. Herzog, In Vivo Sarcomere Lengths Become More Non-uniform upon Activation in Intact Whole Muscle. *Front. Physiol.*, 07 December 2017

E. Moo, D. Peterson, T. Leonard, M. Kaya, W. Herzog  
In vivo muscle force and muscle power during near-maximal frog jumps. *PLOS* 2017 Mar 10;12(3):e0173415.

DuVall M, Jinha A, Schappacher-Tilp G, Leonard T, Herzog W (2017) Differences in Titin segmental elongation between passive and active stretch in skeletal muscle. *Journal of Experimental Biology* 220 (23): 4418-4425.

## 2016

W. Herzog, G. Schappacher, M. DuVall, T.R. Leonard and J. Herzog. Residual force enhancement following eccentric contractions: A new mechanism involving titin. *Physiology* 31:300-213.

Gudrun Schappacher-Tilp, Timothy Leonard, Gertrud Desch and Walter Herzog. Computing average passive forces in sarcomeres in length-ramp simulations. *PLoS Comput Biol*. June 8, 2016.

## 2015

K. Collins, R. Reimer, R. Seerattan, T. Leonard, W. Herzog (2015) Using Diet-Induced Obesity to Understand a Metabolic Subtype of Osteoarthritis in Rats. *Osteo and Cartilage*. 2015 Jun;23(6):957-65.

Schappacher-Tilp G, Leonard T, Desch G, Herzog W (2015) A Novel Three-Filament Model of Force Generation in Eccentric Contraction of Skeletal Muscles. *PLoS ONE* 10(3).

Leumann, A., Fortuna, R, Leonard, T.R., Valderrabano, V. and Herzog, W. (2015) Tibiofemoral Loss of Contact Area but no Changes in Peak Pressures after Meniscectomy in a Lapine In-Vivo Quadriceps Force Transfer Model. *Knee Surg Sports Traumatol Arthrosc.* 23(1):65-73.

## 2014

Powers K, Schappacher-Tilp G, Jinha A, Leonard T, Nishikawa K, Herzog W. (2014) Titin force is enhanced in actively stretched skeletal muscle. *J Exp Biol.* 217, 3629-3636.

Egloff, C., Sawatsky, A., Leonard, T.R., Hart, D., Valderrabano, V. and Herzog W. (2014) Effect of muscle weakness and joint inflammation on the onset and progression of osteoarthritis in the rabbit knee. *Osteoarthritis and Cartilage* 22:1886-1893.

Egloff C, Sawatsky A, Leonard T, Fung T, Valderrabano V, Herzog W. (2014) Alterations in patellofemoral kinematics following vastus medialis transection in the anterior cruciate ligament deficient rabbit knee. *Clin Biomech* May;29(5):577-82.

JA Herzog, TR Leonard, A Jinha, W Herzog. (2014) Titin (Visco-) Elasticity in Skeletal Muscle Myofibrils. *Mol Cell. Biomech.* 11(1):001-017.

## 2013

Herzog W, Leonard TR. (2013). Residual force enhancement: the neglected property of striated muscle contraction. *J Physiol.* 2013 Apr 15;591(8):2221.

Leumann A, Fortuna R, Leonard T, Valderrabano V and Herzog W. (2013) Dynamic in-vivo force transfer in the lapine knee loaded by quadriceps muscle contraction. *Clin Biomech.* 28:199-204.

## 2012

Vaz, M.A., de la Rocha Freitas, C., Leonard, T. and Herzog, W. 2012. The force-length relationship of the cat soleus muscle. *Muscles, ligament and tendons journal* 2(2):79-84.

Szabo, E, Egloff, C, Seerattan, R, Leonard, T and Herzog, W. 2012. Strength training of the quadriceps Muscles following ACL loss: Effects on strength and Joint Integrity. *Sport Ortho Trauma* 28,266-273.

Herzog W., Leonard T., Joumaa V., DuVall M and Panchangam A. 2012. The three filament model of skeletal muscle stability and force production. *Mol Cell Biomech* Sep;9(3):175-191.

Herzog, W., Tang, C. and Leonard T. 2012. Internal carotid artery strains during high-speed, low-amplitude spinal manipulations of the neck. *J Manipulative Physiol Ther.* Nov 6. doi: :pii: S0161-4754(12

Herzog, W., Leonard, T.R., Symons, B., Tang, C. and Wuest, S. 2012. Vertebral artery strains during high-speed, low amplitude cervical spinal manipulation. *J. Electromyogr Kinesiol.* 22: 740-746.

Symons B, Wuest S, Leonard TR and Herzog W. 2012. Biomechanical characterization of cervical spinal manipulation in living subjects and cadavers. *J Electromyogr Kinesiol.* 22:747-751.

Herzog J, Leonard TR, Jinha A, Herzog W. 2012. Are Titin Properties Reflected in Single Myofibrils? *J Biomech.* 45:1893-1899.

Horisberger M, Fortuna R, Leonard TR, Valderrabano V, Herzog W. 2012. The influence of cyclic concentric and eccentric submaximal muscle loading on cell viability in the rabbit knee joint. *Clin Biomech (Bristol, Avon)* 27(3): 292-298.

Herzog W, DuVall M and Leonard TR. 2012. Molecular mechanisms of muscle force regulation: a role for titin? *Exerc Sport Sci Rev.* Jan 40(1), 50-57.

Leumann A., Longino D., Fortuna, R., Leonard T.R., Vaz M., Hart D. and Herzog W. 2012. Altered cell metabolism in tissue of the knee joint in a rabbit model of Botulinum toxin-A induced quadriceps muscle weakness. *Scand J Med Sci Sports Dec;22(6):776-782.*

## **2010**

Leonard TR, Duvall M, Herzog W. 2010. Force enhancement following stretch in a single sarcomere. *Am J Physiol-Cell Physiol.* Dec;299(6):C 1398-1401.

Leonard TR, Joumaa V, Herzog W. 2010. An activatable molecular spring reduces muscle tearing during extreme stretching. *J Biomech.* Vol.43: 3063-3066.

Herzog W, Joumaa V, Leonard TR. 2010. The force-length relationship of mechanically isolated sarcomeres. *Adv Exp Med Biol.*:682:141-61.

Wuest S, Symons B, Leonard T.R., Herzog W. 2010. Preliminary report: biomechanics of vertebral artery segments C1-C6 during cervical spinal manipulation. *J Manipulative Physiol Ther.* 2010 May;33(4):273-8.

Leonard, T.R. and Herzog, W. 2010. Regulation of muscle force in the absence of actin-myosin based cross-bridge interaction. *Am. J. Physiol-Cell Physiol.* Jul;299(1):C 14-20.

Herzog, W., Joumaa, V. and Leonard, T.R. 2010. On the mechanics of single sarcomeres. *Molecular and Cellular Biomechanics.* vol. 7 (1) pp. 25-31.

Herzog W, Leonard TR, Abusara, Z, Han SK, Sawatsky, A. In-vivo Cartilage Mechano-Biology: How to Make Progress in Osteoarthritis Research, IFMBE proceedings 35:3-6 · December 2010

## **2009**

Hisey B, Leonard T.R., Herzog W. 2009. Does residual force enhancement increase with increasing stretch magnitudes? *J. Biomech.* Jul 22;42(10):1488-92.

Rehan Youssef A., Longino D., Seerattan R., Leonard T.R., Herzog W. 2009. Muscle weakness causes joint degeneration in rabbits. *Osteoarthritis and Cartilage Sept;17(9):1228-35.*

## 2008

Joumaa V., Leonard T.R., Herzog W. Residual force enhancement in myofibrils and sarcomeres. *Proc Biol Sci.* 2008 Jun 22;275(1641):1411-9.

Herzog W., Leonard, T.R., Joumaa V. and Mehta, A. Mysteries of Muscle contraction. *J Appl Biomech.* 2008 Feb;24(1):1-13.

V. Joumaa, Rassier, D., Leonard, T.R. and Herzog, W. (2008) The origin of passive force enhancement in skeletal muscle. *Am J Physiol Cell Physiol.* 294: C74-C78.

Yaraskavitch M, Leonard T, Herzog W. Botox produces functional weakness in non-injected muscles adjacent to the target muscle. *J Biomech.* 41(4):897-902.

Kaya, M., Leonard, T.R. and Herzog, W. (2008) Premature deactivation of soleus during the propulsive phase of cat jumping. *J. R. Soc. Interface* 5:415-426.

## 2007

Joumaa, V., Rassier, D.E., Leonard, T.R. and Herzog, W. (2007). Passive force enhancement in single myofibrils. *Pflugers Archiv- Eur. J. Physiol.* Nov;455(2):367-71

Herzog, W. and Leonard, T.R. (2007) Residual force depression is not abolished following a quick shortening step. *J Biomech.* 40(12):2806-10.

Herzog, W. and Leonard, T.R. (2007) Response to the (Morgan and Proske) Letter to the Editor by Walter Herzog (on behalf of the authors) and Tim Leonard. *J. Physiol.* 578:617-620.

## 2006

Bullimore, S., Leonard, T.R., Rassier, D. Herzog, W. (2006) History-dependence of isometric muscle force: Effect of prior stretch or shortening amplitude. *J. Biomech.* 40: 1518-1524.

Clark, A.L., Leonard, T. Barclay, L. Matyas, J and Herzog, W. (2006) Heterogeneity in patellofemoral cartilage adaptation to anterior cruciate ligament transection; chondrocyte shape and deformation with compression. *Osteoarthritis and Cartilage.* 14(2):120-30.

Kaya, M., Leonard, T.R. and Herzog, W. (2006) Control of ground reaction forces by hind limb muscles during cat locomotion. *J. Biomech.* 39(15): 2752-2766.

## 2005

Leonard, T.R. and Herzog, W. (2005) Does the speed of shortening affect steady-state force depression in cat soleus muscle? *J. Biomechanics* 38:2190-2197.

Butterfield TA, Leonard TR, Herzog W. (2005) Differential serial sarcomere number adaptations in knee extensor muscles of rats is contraction type dependent. *J Appl. Physiol.* Oct;99(4):1352-1358.

Longino D, Frank C, Leonard TR, Vaz MA, Herzog W. (2005) Proposed model of botulinum toxin-induced muscle weakness in the rabbit. *J Orthop Res.* November 23(6): 1411-1418.

Kaya M, Jinha A, Leonard TR, Herzog W. (2005) Multi-functionality of the cat medial gastrocnemius during locomotion. *J Biomech.* Jun;38(6):1291-301.

Boyd SK, Muller R, Leonard T, Herzog W. (2005) Long-term periarticular bone adaptation in a feline knee injury model for post-traumatic experimental osteoarthritis. *Osteoarthritis Cartilage*. Mar; 13(3): pp. 235-42.

Clark AL, Leonard TR, Barclay LD, Matyas JR, Herzog W. (2005) Opposing cartilages in the patellofemoral joint adapt differently to long-term cruciate deficiency: chondrocyte deformation and reorientation with compression. *Osteoarthritis Cartilage*. Dec;13(12):1100-14

Herzog, W. and Leonard, T.R. (2005) The role of passive structures in force enhancement of skeletal muscles following active stretch. *J. Biomechanics* 38:409-415.

#### **2004**

Schachar, R., Herzog, W. and Leonard, T. (2004) The effects of muscle stretching and shortening on isometric forces on the descending limb of the force-length relationship. *Journal of Biomechanics* June; 37(6):917-26

#### **2003**

Kaya, M., Leonard, T.R. and Herzog, W., (2003) Coordination of medial gastrocnemius and soleus forces during cat locomotion. *J. Exp. Biol.* 206:3645-3655.

Herzog, W., Schachar, R., and Leonard, T.R. (2003) Characterization of the passive component of force enhancement following active stretching of skeletal muscle. *J. Exp. Biol.* 206.,pp 3635-3643.

#### **2002**

Symons, B., Leonard, T. , Herzog, W. (2002) Internal forces sustained by the vertebral artery during spinal manipulative therapy. *Journal of Manipulative and Physiological Therapeutics* 25:504-510.

Schachar, R., Herzog, W., Leonard, T.R. (2002) Force enhancement above the initial isometric force on the descending limb of the force-length relationship. *Journal of Biomechanics* 35: 1299-1306.

Herzog, W. and Leonard, T.R. (2002) Force enhancement following stretching of skeletal muscle: a new mechanism. *Journal of Experimental Biology* 205:1275-1283.

Kaya, M., Carvalho, W., Leonard, T.R., and Herzog, W.(2002) Estimation of cat medial gastrocnemius fascicle lengths during dynamic contractions. *Journal of Biomechanics* 35: 893-902.

Clark, A.L., Herzog, W., Leonard, T.R. (2002). Contact area and pressure distribution in the feline patellofemoral joint under physiologically meaningful loading conditions. *Journal of Biomechanics* 35:53-60.

#### **2001**

Hae-Dong Lee, Walter Herzog, Tim Leonard. (2001) Effects of cyclic changes in muscle length on force production in in-situ cat soleus. *Journal of Biomechanics* 34: 979-987.

#### **2000**

Herzog, W., Hasler, E.M. and Leonard, T.R. (2000) Experimental determination of in vivo pressure distribution in Biologic joints. *Journal of Musculoskeletal Research* 4: 1-7.

Herzog, W., Leonard, T.R., Wu, J.Z. (2000) The relationship between force depression following shortening and mechanical work in skeletal muscle. *Journal of Biomechanics* 33:659-668.

Symons, B., Herzog W., Leonard T., Nguyen H. (2000) Reflex responses associated with Activator treatment. *Journal of Manipulative and Physiological Therapeutics* 23: 155-159.

Herzog, W., Leonard, T.R. (2000). The history dependence of force production in mammalian skeletal muscle following stretch-shortening and shortening-stretch cycles. *Journal of Biomechanics* 33: 531-542.

Herzog, W., Koh, T., Hasler, E., Leonard T. (2000) Specificity and Plasticity of mammalian skeletal muscles. *Journal of Applied Biomechanics* 16:98-109.

### **1999**

Herzog W, Hasler EM, Maitland ME, Suter E, Leonard TR, Müller C. (1999) In-vivo mechanics and in-situ stability of the anterior cruciate ligament-deficient knee.

*Outlines of Biomechanics Research*:11-27.

### **1998**

Herzog, W., Leonard, T.R., Wu, J. (1998) Force Depression following skeletal muscle shortening is long lasting. *Journal of Biomechanics* 31:1163-1168.

Herzog W., Diet S., Suter E., Mayzus P., Leonard T.R., Müller C., Wu J.Z., Epstein M. (1998) Material and functional properties of articular cartilage and patellofemoral contact mechanics in an experimental model of osteoarthritis. *Journal of Biomechanics* 31:1137-1145.

Suter E., Herzog W., Leonard T.R., Nguyen H. (1998) One-year changes in hind limb kinematics, ground reaction forces and knee stability in an experimental model of osteoarthritis. *Journal of Biomechanics* 31:511-517.

Maitland M, Leonard T, Frank CB, Shrive NG, Herzog W. (1998) A method to assess in-vivo knee stability longitudinally in an animal model of ligament injury. *Journal of Orthopaedic Research* 16:441-447.

Maitland ME, Leonard T, Frank CB, Shrive NG, Herzog W. (1998) Longitudinal measurement of tibial motion relative to the femur during passive displacements and femoral nerve stimulation in the ACL-deficient cat model of osteoarthritis. *Journal of Orthopaedic Research* 16:448-454.

Herzog W, Hasler EM, Maitland ME, Suter E, Leonard TR, Müller C. (1998) In-vivo mechanics and in-situ stability of the anterior cruciate ligament-deficient knee. An animal model of osteoarthritis. *Sportorthopädie-Sporttraumatologie* 14.2:67-74

Hasler EM, Herzog W, Leonard TR, Stano A, Nguyen H. (1998) In-vivo knee joint loading and kinematics before and after ACL transection in an animal model. *Journal of Biomechanics* 31:253-262

### **1997**

Herzog, W., Leonard T.R. (1997) Dynamic force properties of soleus and sensorimotor interactions of soleus, m. gastrocnemius and tibialis anterior in the freely moving cat. *Journal of Musculoskeletal Research* 1(2):95-109.

Herzog W, Leonard TR. (1997) Depression of cat soleus force following isokinetic shortening. *Journal of Biomechanics* 30:865-872.

Vaz MA, Herzog W, Zhang YT, Leonard TR, Nguyen H. (1997) The effect of muscle length on electrically elicited muscle vibrations in the in-situ cat soleus muscle. *Journal of Electromyography and Kinesiology* 7:113-121

Prilutsky BI, Herzog W, Leonard TR, Allinger TL. (1997) Response to letter to the editor re: Role of muscle belly and tendon of soleus, gastrocnemius and plantaris in mechanical energy absorption and generation during cat locomotion. *Journal of Biomechanics* 30:309

### **1996**

Koh T.J. and Leonard T.R. (1996) An implantable electrical interface for in vivo studies of the neuromuscular system. *Journal of Neuroscience Methods* 70:27-32.

Herzog W, Hasler EM, Leonard TR. (1996) In-situ calibration of the implantable force transducer. *Journal of Biomechanics* 29: 1649-1652.

Vaz MA, Herzog W, Zhang YT, Leonard TR, Nguyen H (1996). Mechanism of electrically elicited muscle vibrations in the in-situ cat soleus muscle. *Muscle and Nerve* 19:774-776.

Prilutsky BI, Herzog W, Leonard T (1996) Transfer of mechanical energy between ankle and knee joints by gastrocnemius and plantaris muscles. *Journal of Biomechanics* 29:391-403.

Prilutsky BI, Herzog W, Leonard TR, Allinger TL (1996) Role of the muscle belly and tendon of soleus, gastrocnemius, and plantaris in mechanical energy absorption and generation during cat locomotion. *Journal of Biomechanics* 29:417-434.

Herzog W, Leonard TR (1996) Soleus forces and soleus force potential during unrestrained cat locomotion. *Journal of Biomechanics* 29:271-279.

Herzog W, Archambault JM, Leonard TR, Nguyen HK (1996) Evaluation of the implantable force transducer for chronic tendon force recordings. *Journal of Biomechanics* 29:103-109.

### **1995**

Herzog W, Leonard TR, Stano A (1995) A system for studying the mechanical properties of muscles and the sensorimotor control of muscle forces during unrestrained locomotion in the cat. *Journal of Biomechanics* 28:211-218.

### **1994**

Herzog W, Zatsiorsky V, Prilutsky BI, Leonard TR (1994) Variations in force-time histories of cat gastrocnemius, soleus, and plantaris muscles for consecutive walking steps. *Journal of Experimental Biology* 191:19-36.

### **1993**

Herzog W, Stano A, Leonard TR (1993) A telemetry system to record force and EMG recordings from cat ankle extensor and tibialis anterior muscles. *Journal of Biomechanics* 26:1463-1471.

Herzog W, Leonard TR, Guimaraes ACS (1993) Forces in gastrocnemius, soleus and plantaris muscles of the freely moving cat. *Journal of Biomechanics*, 26:945-953.



**1992**

Herzog W, Leonard TR, Renaud JM, Wallace J, Chaki G, Bornemisza S (1992) Force-length properties and functional demands of cat gastrocnemius, soleus and plantaris muscles. *Journal of Biomechanics*, 25: 1329-1335.

**1991**

Herzog W, Leonard TR (1991) Validation of optimization models that estimate the forces exerted by synergistic muscles. *Journal of Biomechanics*, 24; S1: 31-39.

**1990**

J.A. Hoffer, T.R. Leonard, C.L. Cleland and T. Sinkjaer (1990). Segmental reflex action in normal and decerebrate cats. *Journal of Neurophysiology*, 64: 1611-1624.

PEER-REVIEWED CONFERENCE PROCEEDINGS

**2022**

Fransiska Bossuyt, Timothy Leonard, Andrew Sawatsky, W. Michael Scott, Walter Herzog. How muscle forces impact tendon strain during locomotion: a direct comparison of in-vivo and in-vitro tendon properties in sheep. North American Congress on Biomechanics, Ottawa, Canada, 21-25 August 2022.

Venus Joumaa\*, Muzammil Nasir, Chris Tiessen, Zain Tariq, Andrew Sawatsky, Tim Leonard and Walter Herzog. EFFECT OF BOTOX INJECTIONS ON THE MORPHOLOGY AND MECHANICAL PROPERTIES OF THE INTERVERTEBRAL DISCS IN RABBITS. North American Congress on Biomechanics, Ottawa, Canada, 21-25 August 2022.

Joumaa, V., Smith, I., Fukutani, A., Leonard, T., Ma, W., Mijailovich, S., Irving, W, Herzog, W. What does low-angle X-ray diffraction tell us about the structure of the contractile filaments after active stretch and shortening? World Congress of Biomechanics, Taipei, July 1-14, 2022

T.R. Leonard, W. Faridi, D. Ramrattan, G. Schappacher-Tilp, E.K. Moo and W. Herzog. SKELETAL MUSCLE TITIN IG DOMAIN REFOLDING AFTER PASSIVE LENGTHENING. Biophysical Society Meeting, Feb 18-23, 2022. San Francisco, USA.

F. Bossuyt, T. Leonard, S. Abramovic; M. Scott, A. Sawatsky, W. Herzog. Quantifying Tendon Strain and Muscle Forces Continuously During Dynamic Movements In Vivo. Orthopedic Research Society, Feb 4-8, 2022. Tampa, FL, USA

**2021**

Bossuyt FM, Han S, Leonard T, Sawatsky A, Zhang Q, Smith C, Adam N, Taylor WR, Herzog W. The use of a wireless passive electronic strain sensor to measure hysteresis of sheep hindlimb tendons: A first step towards directly comparing in vitro and in vivo tendon properties. XXVIII CONGRESS OF THE INTERNATIONAL SOCIETY OF BIOMECHANICS (ISB) July 25-29, 2021, Stockholm, Sweden

MENG LI, Tim Leonard, Walter Herzog. THE MECHANISMS UNDERLYING SARCOMERE LENGTH NON-UNIFORMITIES IN SKELETAL MUSCLES. 21<sup>st</sup> Biennial Meeting May 25-28,2020, Montreal, Canada

**2020**

G. Schappacher-Tilp, T. Leonard, and W. Herzog. Locally de-activated sarcomeres in a myofibril: theory and pilot data. VPH2020 Conference, Paris 26-28 August 2020.

**2019**

Timothy Leonard, Venus Joumaa, Kelly Larkin-Kaiser, Walter Herzog. Adductor Longus Myofibrillar Passive Stiffness is reduced in Cerebral Palsy. International Society of Biomechanics, Calgary, Canada. July 31 - August 4, 2019.

Mathew Millard, Tim Leonard and Walter Herzog. Is titin actively preloaded? A method for testing active force development mechanisms involving titin. 4<sup>th</sup> Rocky Mountain Muscle Symposium, Canmore, Canada. July 27-29, 2019.

Venus Joumaa, Timothy R. Leonard, Walter Herzog. Residual Force Enhancement: Towards a Better Understanding of Muscle Contraction. 4<sup>th</sup> Rocky Mountain Muscle Symposium, Canmore, Canada. July 27-29, 2019.

Timothy Leonard, Venus Joumaa, Kelly Larkin-Kaiser, Walter Herzog. Adductor Longus Myofibrillar Passive Stiffness is Reduced in Cerebral Palsy. 4<sup>th</sup> Rocky Mountain Muscle Symposium, Canmore, Canada. July 27-29, 2019.

## **2018**

Venus Joumaa, Ian C. Smith, Atsuki Fukutani, Timothy R. Leonard, Weikang Ma, Thomas C. Irving and Walter Herzog. EQUATORIAL AND MERIDIONAL X-RAY REFLECTIONS AFTER ACTIVE STRETCH AND SHORTENING IN SKELETAL MUSCLE. 47<sup>th</sup> European Muscle Conference, Budapest, Hungary, August 30-September 3, 2018.

V. Joumaa, I.C. Smith, A. Fukutani, T.R. Leonard, W. Ma, T.C. Irving and W. Herzog. EVIDENCE FOR ACTIN FILAMENT STRUCTURAL CHANGES AFTER ACTIVE SHORTENING IN SKINNED MUSCLE BUNDLES. Biophysical Society Meeting, San Francisco, USA, Feb 17-21, 2018.

## **2017**

Tim Leonard, Azim Jinha and Walter Herzog. LOCALLY DEACTIVATED SARCOMERES DO NOT OVER-LENGTHEN IN MYOFIBRILS. XXVI Congress of the International Society of Biomechanics, Brisbane, Australia, 23-27 July, 2017.

T. Leonard and W. Herzog. ACTIVATED SKELETAL MUSCLE MYOFIBRILS HAVE DIFFERENT PEAK STRESSES AT SIMILAR SARCOMERE LENGTHS WHEN LENGTHENED BEYOND MYOFILAMENT OVERLAP. Biophysical Society Meeting, New Orleans, USA, Feb 11-15, 2017.

## **2016**

V. Joumaa, I. Smith, T. Leonard and W. Herzog. EFFECT OF ACTIVE SHORTENING AND STRETCHING ON LATTICE SPACING AND CROSS-BRIDGE BINDING IN SKINNED MUSCLE FIBRES. Biophysical Society Meeting, Los Angeles, USA, Feb 27-March 2, 2016.

## **2015**

T. Leonard, J. Herzog, A. Jinha, W. Herzog. PEAK FORCE AND HYSTERESIS IN ACTIVELY AND PASSIVELY LENGTHENED SKELETAL MUSCLE MYOFIBRILS AT VERY LONG SARCOMERE LENGTH. XXV Congress of the International Society of Biomechanics, Glasgow, UK, July 12-16, 2015.

M. Engel, T. Leonard and W. Herzog. Long-term simulation results in sarcomere length non-uniformity. XXV Congress of the International Society of Biomechanics, Glasgow, UK, July 12-16, 2015.

Kelly Larkin-Kaiser, V. Joumaa, T. Leonard J. Howard, W. Herzog. Larger isoforms of titin are associated with increased sarcomere lengths and severity of hip displacement in cerebral palsy. XXV Congress of the International Society of Biomechanics, Glasgow, UK, July 12-16, 2015.

Atsuki Fukutani, A. Sawatsky, T. Leonard and W. Herzog. Does Achilles tendon contribute to the force potentiation induced by stretch-shortening cycles? XXV Congress of the International Society of Biomechanics, Glasgow, UK, July 12-16, 2015.

J. Herzog, T. Leonard, A. Jinha, W. Herzog. TITIN HYSTERESIS IS GREATER FOR ACTIVELY LENGTHENED COMPARED TO PASSIVELY LENGTHENED SKELETAL MUSCLE SARCOMERES. Biophysical Society Meeting, Baltimore, USA, February 7-11, 2015.

## **2014**

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