

Liang-Ching Tsai, PhD

Education

2011-2014, Post-doctoral Fellow, Rehabilitation Institute of Chicago / Northwestern University, Chicago, IL

2005-2011, Ph.D., Biokinesiology, University of Southern California, Los Angeles, CA

2003-2005, M.S., Human Movement Science, University of North Carolina at Chapel Hill, Chapel Hill, NC

1996-2000, B.S., Physical Therapy, National Taiwan University, Taipei, Taiwan

Biography

Dr. Liang-Ching Tsai is an Associate Professor in the Department of Physical Therapy at Georgia State University dedicated to advancing the research in Physical Therapy with an ultimate goal of better understanding biomechanical injury mechanisms and developing effective interventions to prevent and treat lower extremity injuries. Dr. Tsai completed his training in Physical Therapy from National Taiwan University. He then pursued his M.S. training in Human Movement Science at the University of North Carolina at Chapel Hill and received his Ph.D. degree in Biokinesiology from the University of Southern California. Before joining Georgia State University, Dr. Tsai was a post-doctoral fellow at the Rehabilitation Institute of Chicago and Northwestern University where he focused on robotic rehabilitation. In addition to his passion for research and teaching in Biomechanics, Dr. Tsai enjoys travel and movies and is a fanatic Tar Heels fan.

Courses Taught

PT 7135 - Therapeutic Application of Physical Agents

PT 7615 - Movement Science I

PT 7825 - Prosthetics and Orthotics (Course Coordinator)

PT 8100 - Introductory Clinical Research

PT 8999 - Capstone Project in Physical Therapy

Selected Publications

Tsai LC, Jeanfreau CM, Hamblin KA, Popovich JM, Lyle MA, Cottmeyer DF, Warren GL. Time, graft, sex, geographic location, and isokinetic speed influence the degree of quadriceps weakness after anterior cruciate ligament reconstruction: A systematic review and meta-analysis. *Knee Surg Sport Tr A* (in press).

Lyle MA, Jensen JC, Hunnicutt JL, Brown JJ, Chambliss CP, Newsome MA, Xerogeanes

JW, Tsai LC. Clinically accessible measures that may help modulate knee loading during gait. *J Athl Train.* (in press).

Law MA, Ko YA, Miller AL, Lauterbach KN, Hendley CL, Johnson JE, Tsai LC. Age, rehabilitation and surgery characteristics are re-injury risk factors for adolescents following anterior cruciate ligament reconstruction. *Phys Ther Sport.* 49:196-203, 2021.

Nguyen LY, Harris KD, Morelli KM, Tsai LC. Increased knee flexion and varus moments during gait with high-heel shoes: A systematic review and meta-analysis. *Gait Posture.* 85(2021):117-125, 2021

Tsai LC, Wu YN, Liu SQ, Zhang LQ. Changes in muscle stress and sarcomere adaptation in mice following ischemic stroke. *Front Physiol.* 11:581846, 2020.

Tsai LC, Cooper ES, Hetzendorfer KM, Warren GL, Chang YH, Willett NJ. Effects of treadmill running and limb immobilization on knee cartilage degeneration and locomotor joint kinematics in rats following knee meniscal transection. *Osteoarthritis Cartilage.* 27(12):1851-59, 2019.

Tsai LC, Ko, YA, Hammond KE, Xerogeanes JW, Warren GL, Powers CM. Increasing hip and knee flexion during a drop landing task reduces tibiofemoral shear and compressive forces: implications for ACL injury prevention training. *J Sports Sci.* 35(24):2405-11, 2017.

Tsai LC, Ren Y, Gaebler-Spira DJ, Revivo G, Zhang LQ. Effects of an off-axis pivoting elliptical training program on gait function in persons with spastic cerebral palsy: a preliminary study. *Am J Phys Med Rehabil.* 96(7):515-22, 2017.

Lin CY, Tsai LC, Press JM, Zhang LQ. Lower limb muscle activation patterns during off-axis elliptical compared to conventional gluteal muscle strengthening exercises. *J Sport Rehabil.* 25(2):164-72, 2016.

Wu YN, Ren Y, Tsai LC, Gao F, Zhang LQ. In vivo simultaneous evaluations of sarcomere imaging and muscle fiber tension. *J Biomech.* 49(5):797-801, 2016.

Tsai LC, Lee SJ, Yang AJ, Ren Y, Press JM, Zhang LQ. Effects of off-axis elliptical training on reducing pain and improving knee function in individuals with patellofemoral pain. *Clin J Sport Med.* 25(6):487-93, 2015.

Tsai LC, Powers CM. Increased hip and knee flexion during landing decreases tibiofemoral compressive loads in females who have undergone anterior cruciate ligament reconstruction. *Am J Sports Med.* 41(2):423-9, 2013.

Tsai LC, Scher IS, Powers CM. Quantification of tibiofemoral shear and compressive loads using a MRI-based EMG-driven knee model. *J Appl Biomech.* 29(2):229-34, 2013.

Tsai LC, McLean S, Colletti PM, Powers CM. Greater muscle co-contraction results in increased tibiofemoral compressive forces in females who have undergone anterior

cruciate ligament reconstruction. J Orthopaed Res. 30(12):2007-14, 2012.

Tsai LC, Colletti PM, Powers CM. Magnetic resonance imaging-measured muscle parameters improved knee moment prediction of an EMG-driven model. Med Sci Sports Exerc. 42(2):305-12, 2012.

Tsai LC, Sigward SM, Pollard CD, Fletcher MJ, Powers CM. Effects of fatigue and recovery on knee mechanics during side-step cutting. Med Sci Sports Exerc. 41(1):1952-7, 2009.

Tsai LC, Yu B, Mercer VS, Gross MT. Comparison of different structural foot types for measures of standing postural control. J Orthop Sports Phys Ther. 36(12):942-53, 2006.

Research Support

R01 (1R01AR080154-01), National Institute of Health (02/2022 - 01/2027); Role: Principal Investigator

RR&D Small Projects in Rehabilitation Research (SPiRE), Department of Veterans Affairs (07/2017 – 06/2020); Role: Co-Investigator

Alliance for Regenerative Rehabilitation Research & Training (AR3T) Pilot Funding Program (07/01/2017 – 06/20/2019); Role: Principal Investigator

2016 Research Grant, Physical Therapy Association of Georgia (03/2010); Role: Principal Investigator

Mary Switzer Research Fellowships, National Institute on Disability and Rehabilitation Research (10/01/2013 – 09/30/2014)

Advanced Rehabilitation Research Training Grant, National Institute on Disability and Rehabilitation Research (12/01/2011 – 09/30/2013)

Matching Dissertation Grant, International Society of Biomechanics (03/2010)

Student Grant-in-Aid Award, American Society of Biomechanics (05/2009)