

*Curriculum Vitae*  
**Michael J. Bey, Ph.D.**  
Senior Scientist  
Henry Ford Health System, Detroit, MI

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## CONTACT INFORMATION

### Office

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Department of Orthopaedic Surgery, Bone & Joint Center  
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## PERSONAL

Birthdate: 12/21/65, Midland, MI  
Marital Status: Married (Kathleen, 6/24/00)  
Children: Twins (Matthew and Caleb, 9/12/03)

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## EDUCATION

B.S., Hope College, Holland, MI 1988  
Department of Computer Science

M.S., University of California, Davis, CA 1994  
Department of Biomedical Engineering  
Thesis: *Analysis of a mathematical model for predicting muscle forces in the lower extremity*

Ph.D., University of Michigan, Ann Arbor, MI 2001  
Department of Biomedical Engineering  
Dissertation: *Injury mechanisms of the shoulder: quantitative analysis of tendons and ligaments*

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## ADDITIONAL PROFESSIONAL DEVELOPMENT

Management & Leadership Skills for Managers, National Seminars Training 2007  
Leadership Academy, Henry Ford Health System 2009-2010  
Time Management & Organization Skills for Professionals, National Seminars Training 2010  
Mark A. Kelley MD Physician Leadership Institute, Henry Ford Health System 2017

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## PROFESSIONAL EXPERIENCE

**Computer Systems Engineer** 1988-1991  
The Upjohn Company  
Kalamazoo, MI

**Research Assistant** 1991-1992  
Department of Kinesiology  
University of Wisconsin, Madison, WI

<b>Research/Teaching Assistant</b> Department of Exercise Science University of California, Davis, CA	1992-1994
<b>Research Fellow</b> Steadman-Hawkins Sports Medicine Foundation Vail, CO	1994-1995
<b>Research Assistant</b> Department of Biomedical Engineering University of Michigan, Ann Arbor, MI	1995-1998
<b>Research Assistant</b> Department of Bioengineering University of Pennsylvania, Philadelphia, PA	1998-2001
<b>Post-Doctoral Research Associate</b> Department of Bioengineering University of Pennsylvania, Philadelphia, PA	2001
<b>Research Assistant Professor</b> Department of Biomedical Engineering University of Cincinnati, Cincinnati, OH	2001-2003
<b>Assistant Scientist</b> Bone and Joint Center Department of Orthopaedic Surgery Henry Ford Health System, Detroit, MI	2003-2009
<b>Assistant Professor, Full-Time Affiliate</b> Department of Biomedical Engineering Wayne State University, Detroit, MI	2003-
<b>Associate Scientist</b> Bone and Joint Center Department of Orthopaedic Surgery Henry Ford Health System, Detroit, MI	2010-2018
<b>Division Head</b> Bone and Joint Center Department of Orthopaedic Surgery Henry Ford Health System, Detroit, MI	2011-
<b>Senior Scientist</b> Bone and Joint Center Department of Orthopaedic Surgery Henry Ford Health System, Detroit, MI	2018-
<b>Assistant Vice President of Research</b> Henry Ford Health System, Detroit, MI	2021-

## **PROFESSIONAL SOCIETY MEMBERSHIPS**

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Biomedical Engineering Society	2001-2003
Orthopaedic Research Society	2001-
American Society of Mechanical Engineers	2001-
American Society of Biomechanics	2007-
American Shoulder and Elbow Surgeons	2008-

## **PROFESSIONAL SERVICE**

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- Journal Reviewer
  - Annals of Biomedical Engineering; American Journal of Physical Medicine & Rehabilitation; American Journal of Sports Medicine; American Journal of Veterinary Research; Clinical Anatomy; Connective Tissue Research; Experimental Mechanics; Journal of Athletic Training; Journal of Applied Biomechanics; Journal of Biomechanical Engineering; Journal of Biomechanics; Journal of Bone and Joint Surgery; Journal of Electromyography and Kinesiology; Journal of Orthopaedic Research; Journal of Shoulder and Elbow Surgery; Lasers in Surgery and Medicine
- Journal of Orthopaedic Research
  - Editorial Review Board (2014-)
- National Institutes of Health
  - Ad-hoc reviewer
    - Skeletal Biology Structure and Regeneration (SBSR) study section, June, 2010
    - Musculoskeletal and Vascular Sciences (ZRG1 MOSS-D) study section, March 2012
    - Skeletal Biology Structure and Regeneration (SBSR) study section, June, 2012
    - Skeletal Biology Structure and Regeneration (SBSR) study section, October, 2014
    - Musculoskeletal and Vascular Sciences (ZRG1 MOSS-C02) study section, March, 2016
    - Surgical Sciences, Biomedical Imaging and Bioengineering (SBIB Z03) study section, March, 2017
    - Skeletal Biology Structure and Regeneration (SBSR) study section, May, 2018
    - Musculoskeletal, Oral, and Skin Sciences (MOSS) IRG special emphasis panel, June, 2018
    - NIAMS Special Emphasis Panel ZAR1 NCB M1, February 28, 2019
    - NIH Special Emphasis Panel ZRG1 ETTN-C: Discovery of Biomarkers, Biomarker Signatures, and Endpoints for Pain, June 14, 2019
    - NIGMS Special Emphasis Panel GM1 RCB-5 (SC), Support of Competitive Research (SCORE) Award Applications, June 28, 2019
    - NIAMS Special Emphasis Panel ZAR1 KS M1, October 31, 2019
  - Standing member
    - Skeletal Biology Structure and Regeneration (SBSR) study section, October 2019 – present

- Canada Foundation for Innovation
  - Ad-hoc reviewer. January, 2014
- American Society of Mechanical Engineers
  - Tendon/ligament mechanics session moderator. Summer Bioengineering Conference (June 2005), Vail, CO
  - Student poster competition judge. Summer Bioengineering Conference (June 2005), Vail, CO
  - Student poster competition judge. Summer Bioengineering Conference (June 2006), Amelia Island, FL
  - Student paper competition judge; Student poster competition judge. Summer Bioengineering Conference (June 2007), Keystone, CO
  - Abstract reviewer. Summer Bioengineering Conference (June 2008), Marco Island, FL
  - Program committee member; Theme leader – Musculoskeletal, Bone and Joint Mechanics; Abstract reviewer. Summer Bioengineering Conference (June 2009), Lake Tahoe, CA
  - Program committee member; Theme leader – Musculoskeletal, Bone and Joint Mechanics; Abstract reviewer. Summer Bioengineering Conference (June 2010), Naples, FL
  - Tendon/Ligament Mechanics session moderator; Abstract reviewer; Student paper competition judge. Summer Bioengineering Conference (June 2011), Farmington, PA
  - Abstract reviewer. Summer Bioengineering Conference (June 2013), Sunriver, OR
- American Society of Biomechanics
  - Program committee member. North American Congress on Biomechanics meeting (August 2008), Ann Arbor, MI
  - Abstract reviewer. American Society of Biomechanics Annual Meeting (June, 2015), Columbus, OH
  - Awards committee member: Young Investigator Post-Doctoral Award (2016)
- Orthopaedic Research Society
  - Abstract reviewer
    - 6<sup>th</sup> Combined Meeting of the Orthopaedic Research Societies (October 2007), Honolulu, HI
    - 54<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (March 2008), San Francisco, CA
    - 55<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (March 2009), Las Vegas, NV
    - 56<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (March 2010), New Orleans, LA
    - 57<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (March 2011), Long Beach, CA
    - 58<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (February 2012), San Francisco, CA
    - 58<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (January 2013), San Antonio, TX
    - 60<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (March 2014), New Orleans, LA

- 61<sup>st</sup> Annual Meeting of the Orthopaedic Research Society (March 2016), Las Vegas, NV
    - 62<sup>nd</sup> Annual Meeting of the Orthopaedic Research Society (March 2017), San Diego, CA
    - 63<sup>rd</sup> Annual Meeting of the Orthopaedic Research Society (March 2018), New Orleans, LA
    - 64<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (February 2019), Austin, TX
    - 65<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (February 2020), Phoenix, AZ
    - 66<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (February 2021), virtual
  - Moderator
    - Shoulder and Elbow Kinematics & Disease session. 60th Annual Meeting of the Orthopaedic Research Society (March 2014), New Orleans, LA
- World Congress of Biomechanics
  - Abstract reviewer. 7<sup>th</sup> World Congress Meeting (July, 2014), Boston
- American Shoulder and Elbow Surgeons
  - Program committee member. 2016 Open Meeting/Specialty Day (March, 2016), Orlando, FL
- International Symposium on Ligaments and Tendons
  - Session moderator. ISL&T annual meeting (March 2006), Chicago, IL
  - Poster competition judge. ISL&T annual meeting (March 2006), Chicago, IL
  - Program committee member. ISL&T annual meeting (Feb 2007), San Diego, CA
  - Program committee member. ISL&T annual meeting (March 2008), San Francisco, CA
  - Session moderator. ISL&T annual meeting (March 2008), San Francisco, CA
  - Program committee member. ISL&T annual meeting (March 2009), Las Vegas, NV
- Henry Ford Health System
  - Research Committee (2009-2012, 2015-2019)
  - Capital Equipment Request Committee (2006-)
  - Research Space Committee (2009-)
  - HFHS-WSU Combined Research Building Steering Committee (2009-10)
  - Dept of Orthopaedic Surgery Residency Applicant Review Committee (2009-12)
  - Research Strategic Planning Committee (2010-)
  - Board of Governors' Human Resources Committee (2017-2019)
  - Director of Center for Health Policy & Health Services Research Search Committee (2018)
  - Annual Research Symposium Committee (2018-)
  - Promotion Review Committee (2020-)
  - Research Vice-Chairs Committee (2020-)
  - Henry Ford Medical Group Membership Committee (2021-)
  - Heart and Vascular Service Line Medical Director Search Committee (2021)
- Wayne State University, Department of Biomedical Engineering
  - Qualifying Exam Committee Member (2006)

- Search Committee Member, Department Chair (2018)

## **AWARDS**

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Charles S. Neer Award Recipient for Excellence in Basic Science Research American Shoulder and Elbow Surgeons	1999
Charles S. Neer Award Finalist for Excellence in Basic Science Research American Shoulder and Elbow Surgeons	2001
Best Thesis Award. Presented at the DJ Frank Resident Thesis Day University of Cincinnati, Cincinnati, OH Department of Orthopaedic Surgery	2003
John Paul Stapp Award: Best Paper of the 51 <sup>st</sup> Stapp Car Crash Conference	2008
John Paul Stapp Award: Best Paper of the 52 <sup>nd</sup> Stapp Car Crash Conference	2009
Undergraduate Design and Research Award Biomedical Engineering Society Annual Meeting	2016

## **FULL-LENGTH PUBLICATIONS**

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1. Hawkins DA and Bey M. A comprehensive approach for studying muscle-tendon mechanics. *Journal of Biomechanical Engineering*, 116:51-55, 1994
2. Hawkins D and Bey M. Muscle and tendon force-length properties and their interactions in vivo. *Journal of Biomechanics*, 30(1):63-70, 1997
3. Hintermeister RA, Bey MJ, Lange GW, Steadman JR, Dillman CJ. Quantification of elastic resistance knee rehabilitation exercises. *Journal of Orthopaedic & Sports Physical Therapy*. 28(1):40-50, 1998
4. Hintermeister RA, Lange GW, Schultheis JM, Bey MJ, Hawkins RJ. Electromyographic activity and applied load during shoulder rehabilitation exercises using elastic resistance. *American Journal of Sports Medicine*. 26(2):210-20, 1998
5. Bey MJ, Elders GJ, Huston LJ, Kuhn JE, Blasler RB, Soslowsky LJ. The mechanism of creation of superior labrum, anterior and posterior lesions in a dynamic biomechanical model of the shoulder: the role of inferior subluxation. *Journal of Shoulder and Elbow Surgery*, 7(4):397-401, 1998
6. Kuhn JE, Bey MJ, Huston LJ, Blasler RB, and Soslowsky LJ. Ligamentous restraints to rotation of the humerus in the late-cocking phase of throwing: a cadaveric biomechanical investigation. *American Journal of Sports Medicine*, 28(2):200-205, 2000
7. Malicky DM, Soslowsky LJ, Kuhn JE, Bey MJ, Mouro CM, Raz JA, Liu CA. Total strain fields of the anteroinferior shoulder capsule under subluxation: a stereoradiogrammetric study. *Journal of Biomechanical Engineering*, 123(5):425-431, 2001

8. Bey MJ, Song HK, Wehrli FW, Soslowky LJ. A non-contact, non-destructive method for quantifying intratissue deformations and strains. *Journal of Biomechanical Engineering* 124(2):253-258, 2002
9. Bey MJ, Song HK, Wehrli FW, Soslowky LJ. Intratendinous strain fields of the intact supraspinatus tendon: the effect of glenohumeral joint position and tendon region. *Journal of Orthopaedic Research*, 20(4):869-874, 2002
10. Bey MJ, Ramsey ML, Soslowky LJ. Intratendinous strain fields of the supraspinatus tendon: effect of a surgically created articular-surface rotator cuff tear. *Journal of Shoulder and Elbow Surgery*, 11(6):562-9, 2002
11. Bey MJ, Hunter SA, Kilambi N, Butler DL, Lindenfeld TN. Structural and material properties of the glenohumeral joint posterior capsule. *Journal of Shoulder and Elbow Surgery*, 14:201-206, 2005
12. Schuler NB, Bey MJ, Shearn JT, Butler DL. Evaluation of an electromagnetic position tracking device for measuring in-vivo, dynamic joint kinematics. *Journal of Biomechanics* 38:2113-2117, 2005
13. Bey MJ, Zael R, Brock SK, Tashman S. Validation of a new model-based tracking technique for measuring 3D, in-vivo glenohumeral joint kinematics. *Journal of Biomechanical Engineering* 128(4):604-9, 2006
14. Bey MJ, Brock SK, Beierwaltes WN, Zael R, Kolowich PA, Lock TR. In-vivo measurement of subacromial space width during shoulder elevation: technique and preliminary results in patients following unilateral rotator cuff repair. *Clinical Biomechanics* 22(7):767-773, 2007
15. Hardy WN, Mason MJ, Foster CD, Shah CS, Kopacz JM, Yang KH, King AI, Bishop J, Bey M, Anderst W, Tashman S. A study of the response of the human cadaver head to impact. *Stapp Car Crash Journal* 51:17-80, 2007
16. Bey MJ, Kline SK, Zael R, Lock TR, Kolowich PA. Measuring dynamic in-vivo glenohumeral joint kinematics: technique and preliminary results. *Journal of Biomechanics* 41:711-714, 2008
17. Nelson FR, Bey M, Fyhrie DP, DiCesare PE. On the horizon from the ORS. *Journal of the American Academy of Orthopaedic Surgeons* 16(4):237-40, 2008
18. Bey MJ, Kline SK, Tashman S, Zael R. Accuracy of biplane x-ray imaging combined with model-based tracking for measuring in-vivo patellofemoral joint motion. *Journal of Orthopaedic Surgery and Research* 3:38, 2008
19. Hardy WN, Shah CS, Mason MJ, Kopacz JM, Yang KH, King AI, Van Ee CA, Bishop JL, Banglmaier RF, Bey MJ, Morgan RM, Digges KH. Mechanisms of traumatic rupture of the aorta and associated peri-isthmus motion and deformation. *Stapp Car Crash Journal* 52:233-65, 2008
20. Bishop JL, Kline SK, Aalderink KJ, Zael R, Bey MJ. Glenoid inclination: in-vivo measures in rotator cuff tear patients and associations with superior glenohumeral joint translation. *Journal of Shoulder and Elbow Surgery* 18(2):231-6, 2009

21. White NA, Begeman PC, Hardy WN, Yang KH, Ono K, Sato F, Kamiji K, Yasuki T, Bey MJ. Investigation of upper body and cervical spine kinematics of post mortem human subjects (PMHS) during low-speed, rear-end impacts. SAE International, 2009-01-0387, April 2009
22. Bey MJ, Kline SK, Zauel R, Kolowich PA, Lock TR. In-vivo measurement of glenohumeral joint contact patterns. EURASIP Journal on Advances in Signal Processing, Vol 2010, Article ID 162136, 2010
23. Scher S, Anderson KA, Weber N, Bajorek J, Rand K, Bey MJ. Associations Between Hip ROM, Shoulder ROM, And Shoulder Injury In Professional Baseball Players. Journal of Athletic Training 45(2):191-197, 2010
24. McDonald CP, Bilkhu SK, Bachison C, Chang V, Bartol SW, Bey MJ. Three-dimensional dynamic in-vivo motion of the cervical spine: assessment of measurement accuracy and preliminary findings. Spine Journal, 10(6):497-504, 2010
25. Deneweth JM, Bey MJ, McLean SG, Lock TR, Kolowich PA, Tashman S. Tibiofemoral joint kinematics of the anterior cruciate ligament-reconstructed knee during a single-leg hop landing. American Journal of Sports Medicine, 38(9):1820-8, 2010
26. Bey MJ, Kline SK, Baker AR, McCarron JA, Iannotti JP, Derwin KA. Estimation of dynamic, in-vivo soft-tissue deformation: experimental technique and application in a canine model of tendon injury and repair. Journal of Orthopaedic Research, 29(6):822-7, 2011
27. Bey MJ, Peltz CD, Ciarelli K, Kline SK, Divine G, van Holsbeeck M, Muh S, Kolowich PA, Lock TR, Moutzouros V. In-vivo shoulder function after surgical repair of a torn rotator cuff: glenohumeral joint mechanics, shoulder strength, clinical outcome and their interaction. American Journal of Sports Medicine 39(10):2117-2129, 2011
28. Bey MJ, Derwin KA. Measurement of in-vivo tendon function. Journal of Shoulder and Elbow Surgery 21(2):149-157, 2012
29. Derwin KA, Milks RA, Davidson I, Iannotti JP, McCarron JA, Bey MJ. Low-dose CT imaging of radio-opaque markers for assessing human rotator cuff repair: accuracy, repeatability and the effect of arm position. Journal of Biomechanics 45(3):614-618, 2012
30. Beaulieu ML, Haladik JA, Bey MJ, McLean SG. Validation of a novel method for quantifying and comparing regional ACL elongations. Journal of Biomechanics 45(14):2710-2714, 2012
31. McDonald CP, Moutzouros V, Bey MJ. Measuring dynamic in-vivo elbow kinematics: description of technique and estimation of accuracy. Journal of Biomechanical Engineering, 134(12), 2012
32. McCarron JA, Derwin KA, Bey MJ, Polster JM, Schils JP, Ricchetti ET, Iannotti JP. Failure with continuity in rotator cuff "healing". American Journal of Sports Medicine, 41(1):134-41, 2013
33. Peltz CD, van Holsbeeck M, Siegal D, Divine G, Bey MJ. ShearWave elastography: repeatability for measurement of tendon stiffness. Skeletal Radiology, 42(8):1151-56, 2013



34. Bishop J, Nurse M, Bey MJ. Shoe inversion does not represent ankle inversion: a dynamic x-ray analysis of barefoot and shod cutting. *Footwear Science*, 6(1), 2014
35. Bishop J, Nurse M, Bey MJ. High top shoes do not reduce ankle inversion: a dynamic x-ray analysis of aggressive cutting in a high-top and low-top shoe. *Footwear Science*, 6(1), 2014
36. McDonald CP, Chang V, McDonald M, Ramo N, Bey MJ, Bartol S. Three-dimensional motion analysis of the cervical spine, comparison of ACDF versus artificial disc in 17 patients. *Journal of Neurosurgery: Spine* 20(3):245-55, 2014
37. Halley SE, Bey MJ, Haladik JA, Lavagnino M, Arnoczky SP. Three dimensional, radiostereometric analysis (RSA) of equine stifle kinematics and articular surface contact: A cadaveric study. *European Veterinary Journal*, 46(3):364-9, 2014
38. Peltz CD, Haladik JA, Hoffman SE, McDonald MJ, Ramo NL, Kolowich PA, Lock TR, Moutzouros V, Bey MJ. Associations between shoulder strength, glenohumeral joint motion, and clinical outcome after rotator cuff repair. *American Journal of Orthopaedics*, 43(5):220-6, 2014
39. Peltz CD, Haladik JA, Hoffman SE, McDonald M, Ramo NL, Nurse MA, Bey MJ. Effects of footwear on three-dimensional tibiotalar and subtalar joint motion during running. *Journal of Biomechanics*, 47(11):2647-53, 2014
40. Kapron AL, Aoki SK, Peters CL, Mass SA, Bey MJ, Zael R, Anderson AE. Accuracy and feasibility of dual fluoroscopy and model-based tracking to quantify in-vivo hip kinematics during clinical exams. *Journal of Applied Biomechanics*, 30(3):461-70, 2014
41. Haladik JA, Vasileff WK, Peltz CD, Lock TR, Bey MJ. Bracing improves clinical outcomes but does not affect the medial knee joint space in osteoarthritic patients during gait. *Knee Surgery, Sports Traumatology, Arthroscopy*, 22(11):2715-20, 2014
42. Keller RA, Steffes M, Zhou D, Bey MJ, Moutzouros V. The effects of ulnar collateral ligament reconstruction on major league pitching performance. *Journal of Shoulder and Elbow Surgery*, 23(11):1591-8, 2014
43. Hofbauer M, Thorhauer E, Abebe E, Bey MJ, Tashman S. Altered tibiofemoral kinematics in the affected knee and compensatory changes in the contralateral knee following anterior cruciate ligament reconstruction. *American Journal of Sports Medicine*, 42(11):2715-21, 2014
44. Marshall NE, Keller RA, Bey MJ, Moutzouros V. Pitching performance and longevity after revision ulnar collateral ligament reconstruction in major league pitchers. *American Journal of Sports Medicine* 43(5):1051-6, 2015
45. Hoffman SE, Peltz CD, Haladik JA, Bey MJ. Dynamic in-vivo assessment of navicular drop while running in barefoot, minimalist, and motion control footwear conditions. *Gait and Posture* 41(3):825-9, 2015
46. Peltz CD, Zael R, Ramo N, Mehran N, Moutzouros V, Bey MJ. Differences in glenohumeral joint morphology between patients with anterior shoulder instability and healthy, uninjured volunteers. *Journal of Shoulder and Elbow Surgery* 24(7):1014-20, 2015

47. Keller RA, Marshall NE, Bey MJ, Ahmed H, Scher C, van Holsbeeck M, Moutzouros V. Pre- and post-season dynamic ultrasound evaluation of the pitching elbow. *Arthroscopy* 31(9):1708-15, 2015
48. Peltz CD, Baumer TG, Mende V, Ramo NL, Mehran N, Moutzouros V, Bey MJ. Effect of arthroscopic stabilization on in-vivo glenohumeral joint motion and clinical outcomes in patients with anterior instability. *American Journal of Sports Medicine* 43(11):2800-8, 2015
49. Peltz CD, Divine G, Drake A, Ramo NL, Zael R, Moutzouros V, Bey MJ. Associations between in-vivo glenohumeral joint motion and morphology. *Journal of Biomechanics* 48(12):3252-7, 2015
50. Baumer TG, Giles JW, Drake A, Zael R, Bey MJ. Measuring three-dimensional thorax motion via biplane radiographic imaging: technique and preliminary results. *Journal of Biomechanical Engineering*, 138(1), 2016
51. Baumer TG, Chan D, Mende V, Dischler J, Zael R, van Holsbeeck M, Siegal DS, Divine G, Moutzouros V, Bey MJ. Effects of pathology and physical therapy on in-vivo shoulder motion and clinical outcomes in patients with a full-thickness rotator cuff tear. *Orthopaedic Journal of Sports Medicine* 4(9), 2016
52. Okoroha K, Mehran N, Duncan J, Spiering T, Bey MJ, van Holsbeeck M, Moutzouros V. Characterization of rotator cuff tears: ultrasound versus magnetic resonance imaging. *Orthopedics*, 40(1), 2017
53. Baumer TG, Mende V, Dischler J, Zael R, van Holsbeeck M, Siegal DS, Divine G, Moutzouros V, Bey MJ. Effects of asymptomatic rotator cuff pathology on in-vivo shoulder motion and clinical outcomes, *Journal of Shoulder and Elbow Surgery* 26(6):1064-1072, 2017
54. Baumer TG, Davis L, Dischler J, Siegal DS, van Holsbeeck M, Moutzouros V, Bey MJ. Shear wave elastography of the supraspinatus muscle and tendon: repeatability and preliminary findings. *Journal of Biomechanics* 53(1):201-204, 2017
55. Chang V, Basheer A, Baumer T, Oravec D, McDonald CP, Bey MJ, Bartol S, Yeni YN. Dynamic measurements of cervical neural foramina during normal neck movements in asymptomatic young volunteers. *Surgical and Radiologic Anatomy*, 2017
56. Dischler JD, Baumer TG, Finkelstein E, Siegal DS, Bey MJ. Associations between years of competition and shoulder function in collegiate swimmers. *Sports Health* 10(2):113-118, 2018
57. Baumer TG, Dischler J, Davis L, Labyed Y, Siegal DS, van Holsbeeck M, Moutzouros V, Bey MJ. The effects of age and pathology on shear wave speed of the human rotator cuff. *Journal of Orthopaedic Research* 36(1):282-288, Jun 28, 2018
58. Yeni YN, Baumer T, Oravec D, Basheer A, McDonald CP, Bey MJ, Bartol S, Chang V. Dynamic foraminal dimensions during neck extension and rotation in fusion and artificial disc replacement: an observational study. *The Spine Journal* 18(4):575-583, 2018

59. Davis L, Baumer TG, Bey MJ, van Holsbeeck M. Clinical Utilization of Shear Wave Elastography in the Musculoskeletal System. *Ultrasonography*, Aug 23, 2018
60. Gullledge CM, Baumer TG, Juliano L, Sweeney M, McGinnis M, Sherwood A, Moutzouros V, Bey MJ. Shear Wave Elastography of the Healing Human Patellar Tendon Following ACL Reconstruction. *Knee* 26(2):347-354, 2019
61. Lawrence RL, Moutzouros V, Bey MJ. Asymptomatic Rotator Cuff Tears. *Journal of Bone and Joint Surgery Reviews* 7(6), 2019
62. Nahm N, Bey MJ, Liu S, Guthrie ST. Ankle motion and offloading in short leg cast and low and high fracture boots. *Foot and Ankle International* 40(12):1416-1423, 2019
63. Yeni Y, Baumer T, Oravec D, Basheer A, Bey MJ, Bartol S, Chang V. Correlation of Neural Foraminal Motion After Surgical Treatment of Cervical Radiculopathy with Long-term Patient Reported Outcomes. *Journal of Spine Surgery* 6(1):18-25, 2020
64. Azad S, Oravec D, Baumer T, Schildcrout A, White P, Basheer A, Bey MJ, Bartol SW, Chang V, Yeni YN. Dynamic Foraminal Dimensions During Neck Motion 6.5 Years After Fusion and Artificial Disc Replacement, *PLOS ONE* 15(8):e0237350, 2020
65. Lee ECS, Roach NT, Clouthier A, Bicknell RT, Bey MJ, Young N, Rainbow MJ. Three-dimensional Scapular Morphology Is Associated With Rotator Cuff Tears And Alters The Abduction Moment Arms Of The Supraspinatus, *Clinical Biomechanics* 78:105091, 2020
66. Lawrence RL, Ruder MC, Zael R, Bey MJ. Instantaneous Helical Axis Estimation of Glenohumeral Kinematics: The Impact of Rotator Cuff Pathology. *Journal of Biomechanics*, Aug 26;109:109924, 2020
67. Jun BJ, Sahoo S, Baker AR, Jin Y, Imrey PM, Erdemir A, Bey MJ, Derwin KA. Variability of Glenohumeral Positioning and Bone-to-Tendon Marker Length Measurement in Repaired Rotator Cuffs from Longitudinal Computed Tomography Imaging, *Journal of Shoulder and Elbow Surgery International* 4(4):838-847, 2020
68. Lawrence RL, Zael R, Bey MJ. Measuring 3D In-vivo Shoulder Kinematics using Biplanar Videoradiography, *Journal of Visualized Experiments* 169, 2021
69. Lawrence RL, Ruder MC, Moutzouros V, Makhni EC, Muh SJ, Siegal D, Soliman SC, van Holsbeeck M, Bey MJ. Ultrasound Shear Wave Elastography And Its Association With Rotator Cuff Tear Characteristics, *Journal of Shoulder and Elbow Surgery International*, 2021 Jan 27;5(3):500-506
70. Ruder MC, Zael R, Diefenbach BJ, Bey MJ. Quantifying Shoulder Activity After Rotator Cuff Repair: Technique And Preliminary Results, *Journal of Orthopaedic Research*, 2021 Jun 30
71. Jun BJ, Ricchetti ET, Haladik J, Bey MJ, Patterson TE, Subhas N, Li ZM, Iannotti JP. Validation of a Metal Artifact Reduction 3-D CT Imaging Method for Quantifying Implant Migration following Anatomic Total Shoulder Arthroplasty, *Journal of Orthopaedic Research*, in press

72. Ruder MC, Lawrence RL, Soliman SB, Zael R, Bey MJ. Pre-Surgical Tear Characteristics and Estimated Shear Modulus as Predictors of Repair Integrity and Shoulder Function One Year After Surgical Rotator Cuff Repair, *Journal of Shoulder and Elbow Surgery International*, in press
73. Lawrence RL, Ruder MC, Zael R, Jalics A, Olszewski A, Diefenbach BJ, Moutzouros V, Makhni EC, Muh S, Bey MJ. In-Vivo Static Retraction and Dynamic Elongation of Rotator Cuff Repair Tissue Three Months After Surgical Repair, *Orthopedic Journal of Sports Medicine*, in review
74. Diefenbach BJ, Ruder MC, Lawrence R, Zael R, Moutzouros V, Bey MJ. Upper Extremity Activity At 2 Weeks And 6 Weeks After Surgical Rotator Cuff Repair: Preliminary Analysis. *Journal of Shoulder and Elbow Surgery*, in review

## **BOOK CHAPTERS**

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1. Soslowsky LJ, Bey MJ, Placide RJ. Biomechanics of the Skeletal System (Volume 2, Chapter 5), in Taveras J and Ferrucci J (eds.) *Radiology*, Lippincott Williams and Wilkins, Philadelphia, 2000
2. Peltz CD, Moutzouros V, Bey MJ. Shoulder Joint Mechanics, in Winkelstein B (editor) *Orthopaedic Biomechanics*, Taylor & Francis, New York, 2013
3. Peltz CD, Moutzouros V, Slotkin S, Bey MJ. Biomechanics Of The Biceps And Labrum, in Hasan SS and Mazzocca AD (editors) *Disorders of the Proximal Biceps Tendon: Evaluation and Treatment*, American Academy of Orthopaedic Surgeons Monograph Series, Chicago, 2013

## **ABSTRACTS**

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1. Bey MJ, Elders GJ, Huston LJ, Kuhn JE, Blasier RB, Soslowsky LJ. Creation of SLAP lesions in a dynamic, biomechanical model of the shoulder: the role of inferior subluxation. *Transactions of the Orthopaedic Research Society*, 22:166, 1997
2. Malicky DM, Soslowsky LJ, Bey MJ, Mouro CM, Kuhn JE. Strain fields of the inferior glenohumeral ligament surface in a subluxed shoulder: a stereoradiogrammetric study. *Transactions of the Orthopaedic Research Society*, 23:1024, 1998
3. Malicky DM, Soslowsky LJ, Bey MJ, Mouro CM, Kuhn JE. Strain fields of the inferior glenohumeral ligament surface in a subluxed shoulder: a stereoradiogrammetric study. *ASME Advances in Bioengineering*, 39:25, 1998
4. Bey MJ and Soslowsky LJ. A technique for quantifying two-dimensional intratendinous rotator cuff strain. *ASME Advances in Bioengineering*, 42:141, 1999
5. Bey MJ and Soslowsky LJ. Two-dimensional intratendinous strains of the human rotator cuff: technique and preliminary results. *Transactions of the Orthopaedic Research Society*, 46:405, 2000

6. Bey MJ and Soslowsky LJ. A non-contact, non-destructive method for quantifying intratendinous strain: validation and application to the human rotator cuff. *International Symposium on Ligaments and Tendons*, 26, 2001
7. Bey MJ, Song H, Wehrli FW, Lee P, Soslowsky LJ. Intratendinous strain fields of the supraspinatus tendon: the effect of a surgically created partial-thickness rotator cuff tear. *ASME Advances in Bioengineering*, 50:45, 2001
8. Lynch H, Bey MJ, Elliott D. Poisson's ratio and modulus for tendon transverse and longitudinal fiber orientations. *Transactions of the Orthopaedic Research Society*, 48:243, 2002
9. Bey MJ, Squire ME, Ramsey ML, Soslowsky LJ. The effect of radial head resection and replacement on strain fields of the anterior medial collateral ligament surface: a stereophotogrammetric study. *Transactions of the Orthopaedic Research Society*, 48:853, 2002
10. Bey MJ, Soslowsky LJ. Intratendinous strain fields of the supraspinatus tendon: the effect of a bursal side partial-thickness rotator cuff tear. *Transactions of the Orthopaedic Research Society*, 48:862, 2002
11. Bey MJ, Lindenfeld TN, Hunter SA, Kilambi N, Butler DL. Structural and material properties of the glenohumeral joint posterior capsule. *Transactions of the Orthopaedic Research Society*, 49:1177, 2003
12. Cha PS, Kolambkar Y, Herfat M, Bey MJ. The effect of abduction and internal rotation on two-dimensional strain fields of the glenohumeral joint posterior capsule: a stereophotogrammetric study. *DJ Frank Resident Thesis Day, Department of Orthopaedic Surgery, University of Cincinnati, Cincinnati, OH*, 2003
13. Bey MJ, Tavazzani F, Hasan SS, Levy MS, Butler DL, Lindenfeld, TN. A new clinical instrument for measuring internal and external shoulder rotation: reliability and early findings in a normal, male population. *Transactions of the Orthopaedic Research Society*, 50:1194, 2004
14. Bey MJ, Kolambkar Y, Herfat M, Hasan SS, Butler DL, Lindenfeld TN. The effects of internal rotation and glenohumeral abduction on posterior capsule strains: a stereophotogrammetric study. *Transactions of the Orthopaedic Research Society*, 50:175, 2004
15. Bey MJ, Tashman S, Brock SK, Les CM. A technique for measuring in-vivo tendon strains with biplane radiography. *International Symposium on Ligaments and Tendons*, 5:16, 2005
16. Bey MJ, Anderst W, Brock SK, Anderson K, Tashman S. In-vivo, dynamic measurement of subacromial space: technique and preliminary results. *Transactions of the Orthopaedic Research Society* 51:607, 2005
17. Bey MJ, Brock SK. Validation of an ultrasound-based technique for measuring in-vivo tendon strains. *Transactions of the Orthopaedic Research Society* 51:724, 2005

18. Bey MJ, Zael R, Brock SK, Tashman S. Validation of a new markerless tracking technique for measuring three-dimensional in-vivo glenohumeral joint motion during dynamic activities. Proceedings of the 2005 Summer Bioengineering Conference, abstract 109276, 2005
19. Bey MJ, Brock SK, Tashman S, Les CM. Measuring dynamic, in-vivo tendon strain with biplane radiography: technique and preliminary results in a canine model. Proceedings of the 2005 Summer Bioengineering Conference, abstract 108144, 2005
20. Bey MJ, Brock SK, Anderst W, Kolowich P, Lock T, Tashman S. In-vivo measurement of glenohumeral joint kinematics: technique and preliminary results in patients following rotator cuff repair. Transactions of the Orthopaedic Research Society 52:281, 2006
21. Bey MJ, Jackson W, van Holsbeeck M. Measuring in-vivo Achilles tendon deformation using ultrasonography and texture correlation: technique and preliminary results. Transactions of the Orthopaedic Research Society 52:33, 2006
22. Bey MJ, Brock SK, Zael R, Tashman S. Validation of a new model-based tracking technique for measuring in-vivo glenohumeral joint motion: effect of testing conditions on reported accuracy. Transactions of the Orthopaedic Research Society 52:1964, 2006
23. Demps EL, Zvirbulis R, Leonard Z, Tashman S, Nelson FRT, Bey MJ, Les CM. Constellations of chronic knee pathology observed during arthroscopy. Transactions of the Orthopaedic Research Society 52:546, 2006
24. Tashman S, Bey MJ, Anderst W, Demps E, Zael R. Model-based tracking of knee kinematics from biplane radiographs: in-vivo validation. Transactions of the Orthopaedic Research Society 52:252, 2006
25. Bey MJ, Brock SK, Wybo CD, Tashman S, Zael R. Validation of a model-based tracking technique for measuring three-dimensional in-vivo patellofemoral joint motion during dynamic activities. Proceedings of the 2006 Summer Bioengineering Conference, abstract 157225, 2006
26. Bey MJ, Brock SK, Beierwaltes WN, Lock T, Kolowich PA, Zael R. In-vivo measurement of glenohumeral joint contact patterns. Transactions of the Orthopaedic Research Society 53:110, 2007
27. Bey MJ, Aalderink KJ, Brock SK, Bishop JL, Beierwaltes WN, Lock T, Kolowich PA, Zael R. Glenoid inclination and superior glenohumeral joint translation in-vivo during shoulder elevation. Transactions of the Orthopaedic Research Society 53:365, 2007
28. Bey MJ, Brock SK, Beierwaltes WN, Lock T, Kolowich PA, Zael R. In-vivo measurement of subacromial space width during shoulder elevation. Transactions of the Orthopaedic Research Society 53:1150, 2007
29. Wybo CD, Bartol SW, Carp JE, Brock SK, Zael R, Bey MJ. Preliminary validation of a model-based tracking technique for measuring three-dimensional in-vivo cervical spine motion during dynamic activities. Transactions of the Orthopaedic Research Society 53:1038, 2007

30. Bey MJ, Brock SK, Baker AR, Derwin KA. Longitudinal measurement of in-vivo tendon function over 17 weeks following repair: technique and preliminary results in a canine rotator cuff model. Proceedings of the 2007 Summer Bioengineering Conference, abstract 176378
31. Demetropoulos CK, Sundararajan S, Bilkhu SK, Hardy WN, Yang KH, Bishop J, Abjornson C, Bey MJ, Herkowitz HN, Bartol SW. Evaluation Of Prodisc-C During Low Speed Rear-End Impact: A Full-Body Post Mortem Human Subject Study, Proceedings of the North American Spine Society, 2007
32. Davis J, Wybo C, Zael R, Bey MJ, Needleman R. Model-based tracking for accurately measuring in vivo foot and ankle motion: validation and original applications. Michigan Orthopaedic Society Annual Meeting, June 22, 2007
33. Aalderink KA, Brock SK, Bishop J, Beierwaltes W, Zael R, Lock T, Kolowich P, Bey MJ. Glenoid inclination and superior glenohumeral joint translation in-vivo during shoulder elevation. Michigan Orthopaedic Society Annual Meeting, June 22, 2007
34. Kolowich PA, Brock SK, Beierwaltes W, Lock TL, Zael R, Bey MJ. In-vivo measurement of glenohumeral joint contact patterns. Michigan Orthopaedic Society Annual Meeting, June 22, 2007
35. Hardy WN, Mason MJ, Foster CD, Shah CS, Kopacz JM, Yang KH, King AI, Bishop J, Bey MJ, Anderst W, Tashman S: A study of the response of the human cadaver head to impact. Proceedings of the Stapp Car Crash Conference, Paper no. 2007-22-0002, November, 2007
36. Davis JJ, Wybo CD, Zael R, Bey MJ, Needleman RL. Model-based Tracking for Accurately Measuring In Vivo Foot and Ankle Motion: Validation and Original Applications. Transactions of the Orthopaedic Research Society 33:1581, 2008
37. Bey MJ, Bishop JL, Kline SK, Baker AR, Derwin KA. Measurement Of In-Vivo Tendon Function Following Repair: Technique And Preliminary Results In A Canine Rotator Cuff Model. Transactions of the Orthopaedic Research Society 33:203, 2008
38. Bey MJ, Kline SK, Kolowich PA, Lock TR. Changes In In-Vivo Glenohumeral Joint Contact Patterns From 3 To 12 Months After Rotator Cuff Repair. Transactions of the Orthopaedic Research Society 33:247, 2008
39. Bilkhu S, Kline SK, Mager M, Davis J, Needleman R, Bey MJ. In-Vivo Measurement Of Tibiotalar Joint Motion: Accuracy Assessment And Preliminary Results. North American Congress on Biomechanics, Abstract #25, 2008
40. Bishop JL, Kline SK, Aalderink KA, Bey MJ. The Relationship Between Glenoid Inclination And In-Vivo Glenohumeral Joint Motion During Shoulder Abduction. North American Congress on Biomechanics, Abstract #14, 2008
41. Kline SK, Zael R, Lock TR, Bey MJ. Changes In In-Vivo Glenohumeral Joint Contact Patterns And Clinical Outcomes From 3 To 12 Months After Rotator Cuff Repair. North American Congress on Biomechanics, Abstract #74, 2008

42. Bey MJ, Kline SK, Deneweth JM, Beierwaltes WN, Kolowich PA, Lock TR. Changes In Glenohumeral Joint Mechanics, Shoulder Strength, And Their Interaction After Rotator Cuff Repair. Transactions of the Orthopaedic Research Society 34:154, 2009
43. Bilkhu SK, Bachison C, Chang V, Bartol S, Bey MJ. 3D Dynamic In-Vivo Motion Of The Cervical Spine: Technique And Preliminary Results. Transactions of the Orthopaedic Research Society 34:1742, 2009
44. Demetropoulos CK, Musich C, Bey MJ, Sundararajan S, Hardy WN, Abjornson C, Yang KH. Evaluation Of Prodisc-C During Low Speed Rear-End Impact: A Full-Body Post Mortem Human Subject Study. Transactions of the Orthopaedic Research Society 34:1750, 2009
45. McDonald CM, Bilkhu SK, Chang V, Bachison C, Bartol SP, Bey, MJ. Three-Dimensional In-Vivo Cervical Spine Kinematics: Preliminary Comparison Of Fusion Patients And Normal Control Subjects. Proceedings of the 2009 Summer Bioengineering Conference, abstract #206289, 2009
46. Bey MJ, Kline SK, Deneweth JM, Haladik J, Kolowich PA, Lock TR. Changes In Glenohumeral Joint Mechanics, Shoulder Strength, And Clinical Outcomes Over Two Years After Rotator Cuff Repair. Proceedings of the 2009 Summer Bioengineering Conference, abstract #205584, 2009
47. Bey MJ, Kline SK, Haladik JA, Deneweth JM, Ciarelli K, Muh S, Moutzouros V. In-Vivo Glenohumeral Joint Mechanics In Young, Healthy Subjects: Dominant Vs. Non-Dominant Shoulders. Transactions of the Orthopaedic Research Society 35:1813, 2010
48. Bey MJ, Kline SK, Ciarelli K, Deneweth JM, Kolowich PA, Lock TR, Moutzouros V. In-Vivo Joint Mechanics, Shoulder Strength, And Their Interaction After Rotator Cuff Repair: 2-Year Follow-Up. Transactions of the Orthopaedic Research Society 35:0077, 2010
49. McDonald CP, Chang V, Bachison C, Bartol SW, Bey MJ. 3D In-Vivo Cervical Spine Kinematics: Preliminary Comparison of Fusion Patients and Control Subjects. Transactions of the Orthopaedic Research Society 35:0147, 2010
50. Deneweth JM, Bey MJ, McLean SG, Tashman S. Tibiofemoral Kinematics of Single-Leg Hopping Following Anterior Cruciate Ligament Reconstruction. Transactions of the Orthopaedic Research Society 35:1973, 2010
51. Muh SJ, Kline SK, Deneweth JM, Bey, MJ. Dynamic, In-vivo Glenohumeral Joint Mechanics of the Normal, Healthy Shoulder: Dominant Versus Non-dominant Shoulders. Proceedings of the Mid-America Orthopaedic Society annual meeting, 2010
52. Moutzouros V, Bey MJ. In-vivo joint mechanics, shoulder strength, and their interaction after rotator cuff repair. Proceedings of the American Orthopaedic Association annual meeting, June, 2010
53. Deneweth J.M., Bey M.J., McLean S.G., Tashman S. Single-leg Hop Landing Mechanics in the ACL-Reconstructed Knee. 17th Congress of the European Society of Biomechanics. Edinburgh, UK. 5-8 July 2010



54. Bey MJ, Ciarelli K, Kolowich P, Lock TR, Moutzouros V, Baker A, Iannotti J, Derwin KA. Biplane X-ray Analysis of In-vivo Shoulder and Tendon Function. Proceedings of the American Society of Biomechanics annual meeting, August, 2010
55. McDonald CP, McDonald MJ, Bartol SW, Bey MJ. 3D In-Vivo Cervical Spine Kinematics: Preliminary Results During Axial Neck Rotation. Transactions of the Orthopaedic Research Society 36:794, 2011
56. McDonald CP, Knight R, Jiang Q, Bartol SW, Bey MJ. MRI Index For Quantifying Cervical Spine Disc Degeneration: Reproducibility And Associations With Age. Transactions of the Orthopaedic Research Society 36:624, 2011
57. Peltz CD, Ciarelli K, Kolowich PA, Lock TR, Moutzouros V, Bey MJ. Clinical Outcome After Rotator Cuff Repair Is Related To Dynamic Joint Mechanics And Shoulder Strength. Transactions of the Orthopaedic Research Society 36:550, 2011
58. Peltz CD, Ciarelli K, Kolowich PA, Lock TR, Moutzouros V, Bey, MJ. The Effect Of Rotator Cuff Repair On Dynamic In-Vivo Glenohumeral Joint Motion: Two Year Follow-Up. Transactions of the Orthopaedic Research Society 36:207, 2011
59. Moutzouros V, Bey MJ. Dynamic, Biplane X-ray Analysis Of In-Vivo Shoulder Function After Rotator Cuff Repair: Two-Year Follow-Up. Proceedings of the American Association of Orthopaedic Surgery annual meeting, February, 2011
60. Peltz CD, Ciarelli K, Haladik J, McDonald M, Ramo N, Moutzouros V, Bey MJ. The Relationship Between In-Vivo Glenohumeral Joint Motion and Joint Morphology in Rotator Cuff Repair Patients and Healthy Control Subjects. Proceedings of the 2011 ASME Summer Bioengineering Conference, abstract #53240, 2011
61. McDonald CP, McDonald MJ, Ramo NL, Bartol SW, Bey MJ. Artificial Disc Versus Fusion: Effect On Three-Dimensional Dynamic In Vivo Cervical Spine Motion. Proceedings of the 2011 ASME Summer Bioengineering Conference, abstract #53301, 2011
62. Moutzouros V, Bey MJ. Clinical Outcome After Rotator Cuff Repair Is Related To Dynamic Joint Mechanics And Shoulder Strength. Proceedings of the American Orthopaedic Association annual meeting, June, 2011
63. McCarron JA, Bey MJ, Derwin KA, Iannotti JP. Rotator Cuff Repair Failure without Formation of a Recurrent Tendon Defect. Proceedings of the American Shoulder and Elbow Surgeons' Closed Meeting, White Sulphur Springs, WV, October 2011
64. Guillou RP, Déjardin LM, McDonald C, Bey MJ: Three-dimensional kinematics of the normal canine elbow at the walk and trot. 21<sup>st</sup> Annual American College of Veterinary Surgeons Symposium, Chicago, IL, November 3-5, 2011
65. Bey MJ, Haladik J, McDonald MJ, Ramo NL, Kolowich P, Lock T, Moutzouros V. Shoulder Strength Ratio Is Associated With Joint Mechanics And Clinical Outcome After Rotator Cuff Repair. Transactions of the Orthopaedic Research Society 37:291, 2012

66. Peltz CD, Haladik J, Zauel R, McDonald M, Ramo NL, Kolowich P, Lock T, Moutzouros V, Bey MJ. Relationships Between Glenoid Morphology And In-Vivo Glenohumeral Joint Motion. *Transactions of the Orthopaedic Research Society* 37:2218, 2012
67. Bey MJ, Haladik J, McDonald MJ, Ramo NL, Kolowich PA, Lock TR, Moutzouros V. The Effect Of Rotator Cuff Integrity On Dynamic, In-Vivo Glenohumeral Joint Motion. *Transactions of the Orthopaedic Research Society* 37:1399, 2012
68. Guillou RP, Déjardin LM, McDonald C, Bey MJ: Three-dimensional kinematics of the normal canine elbow at the walk and trot. 39<sup>th</sup> Annual Meeting of the Veterinary Orthopedic Society, Crested Butte, CO, March 3-10, 2012
69. Haladik JA, Vasileff WK, Lock TR, Bey MJ. Effect Of An Osteoarthritis Unloading Brace on Dynamic, In-vivo Tibiofemoral Joint Mechanics and Clinical Outcome. *Proceedings of the Mid-America Orthopaedic Association annual meeting*, May, 2012
70. Moutzouros V, Bey MJ. The Effect Of Rotator Cuff Integrity On Dynamic, In-Vivo Glenohumeral Joint Motion. *Proceedings of the American Orthopaedic Association annual meeting*, June, 2012
71. Moutzouros V, Bey MJ. Relationships Between Glenoid Morphology And In-Vivo Glenohumeral Joint Motion. *Proceedings of the American Orthopaedic Association annual meeting*, June, 2012
72. Guillou RP, Déjardin LM, McDonald C, Bey MJ. Three-dimensional kinematics of the normal canine elbow at the walk and trot. 21<sup>st</sup> European College of Veterinary Surgeons Annual Scientific Meeting, Barcelona, Spain, July 5-7, 2012
73. Bey MJ, Haladik JA, McDonald M, Ramo N, Kolowich PA, Lock TR, Moutzouros V. Shoulder Strength Ratio Is Associated With Joint Mechanics And Clinical Outcome After Rotator Cuff Repair. *Proceedings of the American Shoulder and Elbow Surgeons' Closed Meeting*, Sea Island, GA, October 2012
74. Peltz CD, Haladik JA, Hoffman SE, Nienstedt MJ, Moutzouros V, Bey MJ. Differences in glenohumeral joint morphology between patients with anterior shoulder instability and control subjects. *Transactions of the Orthopaedic Research Society Annual Meeting*, 38:1136, 2013
75. Peltz CD, Haladik JA, McDonald MJ, Ramo N, Moutzouros V, Bey MJ. The effect of shoulder instability on dynamic in-vivo glenohumeral joint motion: preliminary findings. *Transactions of the Orthopaedic Research Society Annual Meeting* 38:1896, 2013
76. Mehran N, Peltz CD, Haladik JA, Hoffman SE, Moutzouros V, Bey MJ. Differences in glenohumeral joint morphology between patients with anterior shoulder instability and control subjects. *Michigan Orthopaedic Society Annual Meeting*, June 21, 2013
77. McDonald CP, Vasileff WK, Moutzouros V, Keller RA, Bey MJ. Dynamic in-vivo elbow kinematics: technique and preliminary findings. *Michigan Orthopaedic Society Annual Meeting*, June 21, 2013

78. Moutzouros V, Bey MJ. The Effect Of Shoulder Instability On Dynamic In-Vivo Glenohumeral Joint Motion. Special Emphasis Poster. Proceedings of the American Orthopaedic Association annual meeting, June 2013, Denver, CO
79. Moutzouros V, Bey MJ. Differences In Glenohumeral Joint Morphology Between Patients With Anterior Shoulder Instability And Control Subjects. Proceedings of the American Orthopaedic Association annual meeting, June 2013, Denver, CO
80. Keller RA, Steffes M, Zhou D, Bey MJ, Moutzouros V. The effects of ulnar collateral ligament reconstruction on major league pitching performance. American Academy of Orthopaedic Surgeons annual meeting, March 2014, New Orleans, LA
81. Peltz CD, Haladik JA, McDonald MJ, Ramo NL, Mehran N, Moutzouros V, Bey MJ. Effect of arthroscopic stabilization on in-vivo glenohumeral joint motion in patients with anterior instability. Orthopaedic Research Society annual meeting, 2014
82. Peltz CD, Haladik JA, Hoffman SE, McDonald MJ, Ramo NL, Nurse MA, Bey MJ. Effects of footwear on three-dimensional tibiotalar and subtalar joint motion during running. Orthopaedic Research Society annual meeting, 2014
83. Keller RA, Steffes M, Zhou D, Bey MJ, Moutzouros V. The effects of ulnar collateral ligament reconstruction on major league pitching performance. American Orthopaedic Society for Sports Medicine annual meeting, July 2014, Seattle, WA
84. Jun B, Li Z, Ricchetti E, Patterson T, Bey MJ, Iannotti JP. In-vivo quantification of glenoid component motion using a clinical CT after total shoulder arthroplasty. World Congress of Biomechanics, July 2014, Boston, MA
85. Bey MJ, Peltz CD, Moutzouros V. Biplane x-ray imaging of in-vivo shoulder function. World Congress of Biomechanics, July 2014, Boston, MA
86. Baumer TG, Giles JW, Drake A, VanLuven M, Bey MJ. Measuring three-dimensional thorax motion using biplane x-ray imaging: technique and accuracy assessment. Orthopaedic Research Society annual meeting, 2015
87. Baumer TG, Peltz CD, Mende V, Moutzouros V, Bey MJ. The effect of physical therapy on glenohumeral joint motion, strength, and clinical outcome in patients with rotator cuff tears. Orthopaedic Research Society annual meeting, 2015
88. Peltz CD, Baumer TG, Familiara RJ, Mehran N, Moutzouros V, Bey MJ. Effect of arthroscopic stabilization on in-vivo glenohumeral joint motion and clinical outcomes in patients with anterior instability. Orthopaedic Research Society annual meeting, 2015
89. Peltz CD, Drake AE, Moutzouros V, Bey MJ. The relationship between critical shoulder angle and in-vivo glenohumeral joint motion in healthy and pathologic shoulders. Orthopaedic Research Society annual meeting, 2015
90. Keller RA, Steffes M, Zhou D, Bey MJ, Moutzouros V. The effects of ulnar collateral ligament reconstruction on major league pitching performance. American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, LA, March 11-14, 2015

91. Marshall NE, Keller RA, Bey MJ, Ahmed H, Scher C, van Holsbeeck M, Moutzouros V. Pre-season ultrasound evaluation of the ulnar collateral ligament and elbow in high school baseball pitchers. Mid-America Orthopaedic Association Annual Meeting, Hilton Head, SC, April 22-26, 2015
92. Giles JW, Baumer T, Drake A, Bey MJ. Assessment of a rib-based technique to define the thoracic coordinate system for use with bi-plane x-ray imaging. XXV Congress of the International Society of Biomechanics, Glasgow, UK. July 12-16, 2015
93. Davis L, Scheer M, Baumer T, Bey MJ, Siegal D. Shear wave elastography: review of applications in musculoskeletal imaging. Society of Skeletal Radiology Annual Meeting, New Orleans, LA, March 13-16, 2016
94. Yeni YN, Baumer T, Oravec D, Basheer A, Bey MJ, Bartol SW, Chang V. Dynamic Foraminal Dimensions During Neck Extension and Rotation in Fusion and Artificial Disc Replacement. Orthopaedic Research Society Annual Meeting, Orlando, FL, March 5-8, 2016
95. Yeni YN, Baumer T, Oravec D, Basheer A, Bey MJ, Chang V, Bartol SW. In Vivo Dynamic Changes in the Foraminal Dimensions During Neck Extension and Rotation. Orthopaedic Research Society Annual Meeting, Orlando, FL, March 5-8, 2016
96. Baumer T, Peltz C, Drake A, Chan D, Mende V, Dischler J, Moutzouros V. Effects of Rotator Cuff Pathology and Physical Therapy on Shoulder Motion and Clinical Outcomes. Orthopaedic Research Society Annual Meeting, Orlando, FL, March 5-8, 2016
97. Baumer T, Peltz C, Zuel R, Moutzouros V, Van Holsbeeck M, Siegal D, Bey MJ. Shear Wave Elastography of the Rotator Cuff: Effects of Age and Shoulder Dominance. Orthopaedic Research Society Annual Meeting, Orlando, FL, March 5-8, 2016
98. Dischler J, Baumer TG, Bey MJ. Effect of Collegiate Swim Training on Rotator Cuff Properties, Shoulder Strength, and Subjective Outcomes. Biomedical Engineering Society Annual Meeting, Minneapolis, MN, October 7, 2016
99. Bartol SW, Chang V, Baumer T, Oravec D, Bey MJ, Yeni YN, McDonald CP, Basheer A. Dynamic foraminal dimensions during neck extension and rotation in fusion and artificial disc replacement. North American Spine Society, Boston, MA, October 26, 2016
100. Baumer TG, Davis L, Mende V, Siegal DS, van Holsbeeck M, Moutzouros V, Bey MJ. Shear Wave Elastography Of The Human Rotator Cuff: Asymptomatic vs. Pathologic Subjects. Orthopaedic Research Society Annual Meeting, San Diego, CA, March 19-22, 2017
101. Baumer TG, Dischler J, Mende V, Zuel R, van Holsbeeck M, Siegal DS, Moutzouros V, Bey MJ. Influence of Asymptomatic Rotator Cuff Pathology On In-Vivo Shoulder Motion and Clinical Outcomes. Orthopaedic Research Society Annual Meeting, San Diego, CA, March 19-22, 2017
102. Baumer TG, Davis L, Dischler J, Siegal DS, van Holsbeeck M, Moutzouros V, Bey MJ. Shear Wave Elastography of the Supraspinatus Muscle and Tendon: Repeatability and

Preliminary Findings. Orthopaedic Research Society Annual Meeting, San Diego, CA, March 19-22, 2017

103. Herfat S, Roach N, Rainbow M, Baumer T, Bey M, Marmor M, Feeley B, Young N. Anatomical Shape of the Shoulder as a Predictor of Rotator Cuff Injury. Orthopaedic Research Society Annual Meeting, San Diego, CA, March 19-22, 2017
104. Yeni YN, Lindquist M, Oravec D, Baumer T, Bey MJ, Bartol S, Chang V. Cervical Nerve Root to Foraminal Size Ratio Correlates with Post-Surgical Patient-Reported Outcomes. Orthopaedic Research Society Annual Meeting, San Diego, CA, March 19-22, 2017
105. Yeni YN, Baumer T, Oravec D, Basheer A, Bey MJ, Bartol SW, Chang V. Does Neural Foraminal Motion Predict Long-term Patient Reported and Radiographic Outcomes After Single-Level Surgical Treatment of Cervical Radiculopathy? Orthopaedic Research Society Annual Meeting, New Orleans, LA, March 10-13, 2018
106. Baumer TG, Gullledge C, Juliano L, Sweeney M, Zael R, Moutzouros V, Bey MJ. Bone-Patellar Tendon-Bone Donor Site Healing After ACL Repair: A Shear Wave Elastography Study. Orthopaedic Research Society Annual Meeting, New Orleans, LA, March 10-13, 2018
107. Baumer TG, Slotkin S, Alkhelaifi K, Gullledge C, Zael R, Bey MJ. Influence Of Rotator Cuff Pathology And Physical Therapy On In-Vivo Pec Minor And Serratus Anterior Lengths. Orthopaedic Research Society Annual Meeting, New Orleans, LA, March 10-13, 2018
108. Baumer TG, Moutzouros V, Zael R, Bey MJ. Factors Influencing Rotator Cuff Surgical Repair Tension In Human Patients. Orthopaedic Research Society Annual Meeting, New Orleans, LA, March 10-13, 2018
109. Baumer TG, Dischler J, Siegal DS, van Holsbeeck M, Moutzouros V, Bey MJ. Rotator Cuff Shear Wave Elastography: Effects of Pathology And Association With Clinical Outcome. Orthopaedic Research Society Annual Meeting, New Orleans, LA, March 10-13, 2018
110. Lee ECS, Roach NT, Clouthier A, Bicknell R, Bey MJ, Young NM, Rainbow MJ. The Effect of Cranial Orientation on Shoulder Biomechanics. Orthopaedic Research Society Annual Meeting, New Orleans, LA, March 10-13, 2018
111. Yeni YN, Azad S, Baumer T, Oravec D, Basheer A, Bey MJ, Bartol SW, Chang V. Dynamic Foraminal Dimensions During Neck Motion 6.5 Years After Fusion and Artificial Disc Replacement. Orthopaedic Research Society Annual Meeting, Austin, TX, February 1-5, 2019
112. Ruder M, Lawrence RL, Baumer T, Zael R, Bey MJ. The Effect of Region of Interest Definition and Data Fidelity on Mean Shear Wave Speed. Orthopaedic Research Society Annual Meeting, Austin, TX, February 1-5, 2019
113. Lawrence RL, Baumer TG, Ruder M, Zael R, Moutzouros V, Bey MJ. The Relationship Between 3D Glenohumeral Morphology and Rotator Cuff Pathology. Orthopaedic Research Society Annual Meeting, Austin, TX, February 1-5, 2019

114. Lawrence RL, Ruder M, Bojnowski J, Moutzouros V, Bey MJ. Supraspinatus Shear Wave Speed as a Predictor of Tear Chronicity and Pre-Operative Shoulder Function. American Physical Therapy Association Combined Sections Meeting, Denver, CO, February 13, 2020
115. Ruder MC, Lawrence RL, Bey MJ. Effects of Running on Experienced Runners' Achilles Tendon Shear Wave Speed. American Society of Biomechanics Annual Meeting, virtual, 2020
116. Ruder MC, Lawrence RL, Zael R, Bey MJ. Preliminary Comparison of Activity Levels Between Rotator Cuff Repair Patients and Control Subjects. American Society of Biomechanics Annual Meeting, virtual, 2020
117. Lawrence RL, Ruder MC, Zael R, Jalics A, Olszewski A, Tcherynouk V, Moutzouros V, Makhni EC, Muh S, Bey MJ. Rotator Cuff Repair Tissue Elongation at 3 months Following Arthroscopic Repair. Orthopaedic Research Society Annual Meeting, virtual, 2021
118. Ruder MC, Zael R, Bey MJ. Quantifying Shoulder Activity After Rotator Cuff Repair: Technique and Preliminary Results. Orthopaedic Research Society Annual Meeting, virtual, 2021
119. Lawrence RL, Ruder MC, Diefenbach BJ, Moutzouros V, Makhni EC, Muh S, Bey MJ. Rotator Cuff Repair Tissue Elongation Measured in-Vivo 3 Months Following Arthroscopic Repair. American Physical Therapy Association (APTA) Combined Sections Meeting; San Antonio, TX, February 2022

## **TEACHING EXPERIENCE**

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1. Human Body Dynamics (BME-220), University of Cincinnati, Department of Biomedical Engineering, Spring 2003
2. Musculoskeletal Biomechanics (BME-5210), Wayne State University, Department of Biomedical Engineering, Winter 2006

## **STUDENT MENTORING**

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<b>Student</b>	<b>Institution / Department</b>	<b>Role</b>	<b>Period</b>
John West	University of Cincinnati Biomedical Engineering	MS Thesis Committee Member	2001-03
Sukhinder Bilkhu	Wayne State University Biomedical Engineering	PhD Dissertation Committee member	2007-08
Austin Szelkowski	Kettering University Mechanical Engineering	Co-Op Advisor	2007-09
Mitch Mager	Kettering University Mechanical Engineering	Co-Op Advisor, Senior Thesis Advisor	2007-09
Jeffrey Haladik	Kettering University Mechanical Engineering	Co-Op Advisor, Senior Thesis Advisor	2007-10
Callie Gunderson	Kettering University Mechanical Engineering	Co-Op Advisor, Senior Thesis Advisor	2007-10

<b>Student</b>	<b>Institution / Department</b>	<b>Role</b>	<b>Period</b>
Kasey Simons	Kettering University Mechanical Engineering	Co-Op Advisor	2007-11
Callie Gunderson	Kettering University Mechanical Engineering	Co-Op Advisor, Senior Thesis Advisor	2007-10
Reunan Guillou	Michigan State University Veterinary Medicine	MS Thesis Committee Member	2008-10
Jessica Deneweth	University of Michigan Mech Eng / Kinesiology	PhD Dissertation Committee Member	2008-12
Colin McDonald	Henry Ford Hospital Bone and Joint Center	Post-Doctoral Research Associate Advisor	2008-10
Derek Chan	Oakland University Physical Therapy	MS Comprehensive Committee Member	2009-10
Danny Miranda	Brown University Biomedical Engineering	PhD Dissertation Committee Member	2009-12
Michael McDonald	Kettering University Mechanical Engineering	Co-Op Advisor	2009-13
Scott Hoffman	Kettering University Mechanical Engineering	Co-Op Advisor	2009-13
Daniel Weitzel	Kettering University Mechanical Engineering	Co-Op Advisor	2009-10
Nicole Ramo	Kettering University Mechanical Engineering	Co-Op Advisor	2009-13
Cathryn Peltz	Henry Ford Hospital Bone and Joint Center	Post-Doctoral Research Associate Advisor	2010-12
Monique Nienstedt	Kettering University Mechanical Engineering	Co-Op Advisor	2011-12
Ashley Kapron	University of Utah Biomedical Engineering	PhD Dissertation Committee Member	2012-13
Veronica Mende	Kettering University Mechanical Engineering	Co-Op Advisor	2013-16
Markia Bowe	Kettering University Mechanical Engineering	Co-Op Advisor	2013-14
Renato Familara	Kettering University Mechanical Engineering	Co-Op Advisor	2013-14
Megan VanLuven	Kettering University Mechanical Engineering	Co-Op Advisor	2013-14
Anne Drake	Case Western Res Univ. Biomedical Engineering	Summer Research Advisor	2013-16
Jack Dischler	Wayne State University Biomedical Engineering	Research Advisor	2015-17
Caleb Gulledege	Wayne State University School of Medicine	Summer Research Mentor	2017
Lauren Juliano	Wayne State University School of Medicine	Summer Research Mentor	2017
Margaret Sweeney	Kenyon University Chemistry	Summer Research Mentor	2017
Michael McGinnis	Wayne State University School of Medicine	Research Mentor	2017

<b>Student</b>	<b>Institution / Department</b>	<b>Role</b>	<b>Period</b>
Allie Sherwood	Wayne State University School of Medicine	Research Mentor	2017
Veronica Tcherynouk	Wayne State University Biomedical Engineering	Research Advisor	2019-21
Alena Jalics	Wayne State University Biomedical Engineering	Research Advisor	2019-
Adam Olszewski	Wayne State University School of Medicine	Research Mentor	2019-

## **INVITED LECTURES**

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1. Injury Mechanisms of the Shoulder: Quantitative Analysis of Tendons and Ligaments  
University of Cincinnati, Department of Biomedical Engineering  
Cincinnati, OH  
February 26, 2002
2. Shoulder Biomechanics – Part I  
Cincinnati Sportsmedicine and Orthopaedic Center  
Cincinnati, OH  
October 8, 2002
3. Shoulder Biomechanics – Part II  
Cincinnati Sportsmedicine and Orthopaedic Center  
Cincinnati, OH  
October 15, 2002
4. Biomechanics of the Shoulder  
University of Cincinnati, Department of Biomedical Engineering  
Cincinnati, OH  
October 17, 2002
5. Introduction to Biomechanics  
University of Cincinnati, Department of Biomedical Engineering  
Cincinnati, OH  
February 10, 2003
6. Biomechanics of the Rotator Cuff  
Henry Ford Hospital  
Bone & Joint Center  
Detroit, MI  
March 14, 2003
7. Long-Term Shoulder Function Following Rotator Cuff Repair  
Wayne State University  
Department of Biomedical Engineering  
Detroit, MI  
October 17, 2005
8. Shoulder Function After Rotator Cuff Repair  
Henry Ford Hospital



Department of Orthopaedic Surgery Grand Rounds  
Detroit, MI  
September 6, 2006

9. Understanding Shoulder Function Following Rotator Cuff Repair Surgery  
University of Michigan, Department of Industrial and Operations Engineering  
Ann Arbor, MI  
October 31, 2006
10. Understanding Shoulder Function Following Rotator Cuff Repair: Experimental Techniques  
And Preliminary Results  
Cleveland Clinic, Cleveland, OH  
Department of Biomedical Engineering  
March 9, 2007
11. Overview Of Motion Analysis Laboratory Research  
Henry Ford Hospital Foundation Board of Directors  
Detroit, MI  
July 30, 2007
12. Alterations In Glenohumeral Joint Contact Patterns After Rotator Cuff Repair  
Henry Ford Hospital  
Department of Orthopaedic Surgery Grand Rounds  
Detroit, MI  
April 23, 2008
13. Shoulder Function Following Rotator Cuff Repair: In-Vivo Imaging With High-Speed X-ray  
University of Utah  
Department of Orthopaedic Surgery Grand Rounds  
April 1, 2009
14. Biplane X-Ray Analysis of In-Vivo Shoulder and Tendon Function  
Brown University / Rhode Island Hospital  
Department of Orthopaedic Surgery Grand Rounds  
December 16, 2009
15. Biplane X-ray Analysis of In-Vivo Shoulder Function After Rotator Cuff Repair  
Henry Ford Hospital  
Department of Orthopaedic Surgery Grand Rounds  
Detroit, MI  
March 24, 2010
16. Biplane X-ray Analysis of In-Vivo Shoulder and Tendon Function  
Keynote Address at the 8<sup>th</sup> International Shoulder Group Meeting  
Minneapolis, MN  
July 27, 2010
17. Biplane X-ray Analysis of In-Vivo Shoulder and Tendon Function  
American Society of Biomechanics, 34<sup>th</sup> Annual Meeting  
Symposium: Application of Biplane X-ray in Basic and Applied Biomechanics Research  
Providence, RI

August 19, 2010

18. Henry Ford Hospital Motion Analysis Laboratory Research Overview  
Nike Global Research Symposium  
Portland, OR  
September 27, 2010
19. Biplane X-ray Analysis of In-Vivo Shoulder Function After Rotator Cuff Repair  
American Shoulder and Elbow Surgeons Closed Meeting  
Scottsdale, AZ  
October 22, 2010
20. Got OA? Free Your Sole! An Unconventional Look at Conventional Footwear and OA  
Henry Ford Hospital  
Bone and Joint Center Research Seminar  
Detroit, MI  
December 17, 2010
21. Bone and Joint Center Research Overview  
Henry Ford Hospital Leadership Academy  
Detroit, MI  
April 27, 2011
22. Biplane X-ray Analysis of In-Vivo Shoulder and Tendon Function  
University of Michigan  
Center for Ergonomics  
December 6, 2011
23. Bone and Joint Center Research Overview  
Henry Ford Hospital Leadership Academy  
Detroit, MI  
April 25, 2012
24. The Effect of Footwear On In-Vivo Foot/Ankle Motion  
Nike Global Research Symposium  
Beaverton, OR  
September 20, 2012
25. Dynamic Assessment Of In-Vivo Shoulder And Tendon Function: Implications For The  
Treatment of Rotator Cuff Tears  
University of Michigan Clinical Research Seminar Series  
Ann Arbor, MI  
March 28, 2013
26. Bone and Joint Center Research Overview  
Henry Ford Hospital Leadership Academy  
Detroit, MI  
April 24, 2013
27. In-Vivo Shoulder And Tendon Function  
Henry Ford Hospital

Department Of Physical Therapy Seminar Series  
Detroit, MI  
October 9, 2013

28. Dynamic Assessment Of In-Vivo Shoulder And Tendon Function: Implications For The Treatment of Rotator Cuff Tears  
University of Toledo, Department of Kinesiology Seminar Series  
Toledo, OH  
November 22, 2013
29. Biplane X-ray Imaging of In-vivo Shoulder Function  
World Congress of Biomechanics  
Boston, MA  
July 10, 2014
30. Bone and Joint Center Research Overview  
Henry Ford Hospital Leadership Academy  
Detroit, MI  
May 25, 2016
31. Rotator Cuff Tears: Techniques for Assessing Etiologic Factors in Human Subjects  
Wayne State University, Department of Biomedical Engineering Seminar Series  
Detroit, MI  
December 4, 2018

## RESEARCH FUNDING: CURRENT

	<b>Title (Role)</b>	<b>Funding Agency</b>	<b>Total Costs</b>	<b>Period</b>
1	Shoulder Function After Rotator Cuff Repair (Principal Investigator)	NIH / NIAMS R01	\$1,881,250	6/1/18 – 5/31/23
2	Investigating The Multi-factorial Etiology Of Rotator Cuff Pathology in Human Subjects (PI: Lawrence) (Primary Mentor)	NIH / NIAMS K99	\$184,256	9/1/20 – 8/31/22

## RESEARCH FUNDING: PENDING

	<b>Title (Role)</b>	<b>Funding Agency</b>	<b>Total Costs</b>	<b>Period</b>
1				

## RESEARCH FUNDING: COMPLETED

	<b>Title (Role)</b>	<b>Funding Agency</b>	<b>Total Costs</b>	<b>Period</b>
1	The Effects of Rotation and Abduction on Posterior Capsule Strain in the Glenohumeral Joint (Principal Investigator)	University of Cincinnati Department of Orthopaedic Surgery	\$5,000	11/1/02 – 4/1/03
2	Development Of Shoulder Rotation Testing Instrument (Principal Investigator)	University of Cincinnati Research Council	\$5,000	1/1/03 – 1/1/04
3	Biomechanical Analysis of MTBI Associated with Football (Sub-Contractor) PI: Cynthia Bir (Wayne State Univ)	NFL Charities	\$20,000	6/1/06 – 5/31/07
4	Investigation of Human Skeletal Kinematics During Impact (Sub-Contractor) PI: King Yang (Wayne State Univ)	Japanese Automobile Research Institute	\$21,060	7/1/06 – 3/31/07
5	Evaluation of Cervical Spine Implant During Impact (Sub-Contractor) PI: C. Demetropoulos (Beaumont Hospital, Royal Oak, MI)	Synthes, Inc. West Chester, PA	\$70,940	10/31/06 – 9/30/07
6	In-vivo Analysis Of Glenohumeral Joint Arthroplasty	Tornier, Inc. Stafford, TX	\$30,000	3/1/06 – 3/1/08

	(Principal Investigator)			
7	Brain Motion During Blunt Impact (Sub-Contractor) PI: Albert King (Wayne State Univ)	NIH / NINDS	\$138,000	5/1/05 – 4/30/08
8	Numerical And Empirical Investigations Of Automobile Related Aortic Injury (Sub-Contractor) PI: King Yang (Wayne State Univ)	Southern Consortium Of Biomechanics	\$20,221	4/1/07 – 3/31/08
9	Rearfoot Motion During Lateral Cutting (Principal Investigator)	Nike, Inc.	\$9,875	5/1/10 – 11/1/10
10	Dynamic Knee Stability After ACL Reconstruction (Sub-Contractor) PI: Scott Tashman (Univ Pittsburgh)	NIH / NIAMS R01	\$513,626	8/1/06 – 7/31/10
11	Shoulder Function After Rotator Cuff Repair (Principal Investigator)	NIH / NIAMS R01	\$1,450,000	2/20/06 – 11/30/10
12	In-Vivo 3D Kinematics And Joint Contact Mapping Of The Normal Canine Elbow (Co-Investigator) PI: Loic DeJardin (Mich. State Univ)	Companion Animal Fund (Michigan State University)	\$35,000	1/1/09 – 12/31/10
13	In-Vivo Motion Of The Knee With A Medial Compartment Unloading Brace (Principal Investigator)	DonJoy	\$26,243	5/1/09 – 12/31/11
14	Glenohumeral Internal Rotation Deficit in Overhead Athletes (Principal Investigator)	University of Michigan, Dept of Orthop Surg	\$14,000	6/1/10 – 6/1/11
15	3D Foot/Ankle Motion During Running (Principal Investigator)	Nike, Inc.	\$100,000	1/1/12 – 12/31/13
16	Efficacy of Physical Therapy For Treating Rotator Cuff Tears (Principal Investigator)	NIH / NIAMS R01	\$594,000	9/23/13 – 8/31/15
17	Shear Wave Elastography To Predict Repair Tissue Healing and Shoulder Function After Rotator Cuff Repair (Principal Investigator)	NIH / NIAMS R21	\$413,375	7/15/18 – 6/30/21