

BETH A. WINKELSTEIN, Ph.D.

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EDUCATION:

Ph.D., Biomedical Engineering, Duke University, Durham, NC December 1999
Advisor: Barry S. Myers, M.D., Ph.D.
Thesis: A Mechanical Basis for Whiplash Injury: The Cervical Facet Joint, Spinal Motion Segment, and Combined Loading

B.S.E., Bioengineering, University of Pennsylvania, Philadelphia, PA May 1993

POSITIONS HELD & RESEARCH EXPERIENCE:

University of Pennsylvania, Philadelphia, PA.
2015-Present Vice Provost for Education, University of Pennsylvania
2012-2015 Associate Dean, Undergraduate Education, School of Engineering & Applied Science
2011-Present Professor, Department of Bioengineering
2011-2012 Chair, Bioengineering Graduate Group
2011-Present Member, Neuroscience Graduate Group
2011-Present Professor, Department of Neurosurgery
2007-2011 Associate Professor, Department of Bioengineering
2007-2011 Associate Professor, Department of Neurosurgery
2009-Present Member, Center for Brain Injury and Repair
2006-Present Member, Penn Center for Musculoskeletal Disorders
2006-Present Member, Center for Human Modeling & Simulation
2006-Present Member, Mechanical Engineering & Applied Mechanics Graduate Group
2002-Present Member, Institute for Medicine and Engineering
2004-2007 Assistant Professor, Department of Neurosurgery
2002-2007 Assistant Professor, Department of Bioengineering

2000-June 2002 Dartmouth College, Hanover, NH.
Postdoctoral Fellow, Anesthesiology, Pharmacology & Orthopaedics

Additional Positions.
2016-2019 Board of Directors, Biomedical Engineering Society
2016-Present Oversight Committee, HeadHealthTECH Challenges, NFL
2015-Present Member, Advisory Board, Univ. of Arkansas Biomedical Engineering Dept.
2014-Present Co-Lead, Biomechanics, Interagency Modeling & Analysis Group, NIH
2012-Present Co-Editor, *Journal of Biomechanical Engineering*
2012-Present Member, External Advisory Board, Duke University Biomedical Engineering Dept.

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| 2010-Present | Elected Member, Cervical Spine Research Society |
| 2008-2010 | Consulting Professor, National University of Singapore, College in BioValley |
| 2008-2014 | Consultant, Zyga Technology, MN |
| 2007-Present | Elected Member, Stapp Car Crash Advisory Committee |

HONORS & DISTINCTIONS:

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| 2016 | Editors' Choice Top Paper in <i>Journal of Biomechanical Engineering</i> |
| 2016 | Van C. Mow Medal, ASME. |
| 2015 | Cervical Spine Research Society, 21 st Century Grant Award. |
| 2014 | 3 rd Place, Basic Science Research Award Paper, Cervical Spine Research Society. |
| 2014 | Panel Member, NIH Roundtable on Disc Degeneration and Back and Neck Pain |
| 2014 | Fellow, Biomedical Engineering Society (BMES) |
| 2013 | 1 st Place, Basic Science Research Award Paper, Cervical Spine Research Society. |
| 2013 | Stapp Association Award, 2 nd Place in Best Student Paper, Stapp Car Crash Conf. |
| 2013 | Ford Motor Company Award for Faculty Advising, University of Pennsylvania. |
| 2013 | Fellow, American Institute for Medical and Biological Engineering (AIMBE) |
| 2012 | Fellow, American Society of Mechanical Engineers |
| 2012-2014 | Penn Fellow, University of Pennsylvania |
| 2011 | Stapp Association Award, 2 nd Place in Best Student Paper, Stapp Car Crash Conf. |
| 2011 | Cervical Spine Research Society, 21 st Century Grant Award. |
| 2011 | Invited participant, National Academies Keck Futures Initiative Conference. |
| 2010 | 1 st Place, Basic Science Research Award Paper, Cervical Spine Research Society. |
| 2010 | Invited participant, IEEE EMBS Forum on Grand Challenges in Neuroengineering. |
| 2009 | Invited participant, NAE Japan-America Frontiers of Engineering Symposium. |
| 2008 | Cervical Spine Research Society, Research Grant Award. |
| 2008 | Stapp Association Award, Best Student Paper, 2008 Stapp Car Crash Conference. |
| 2007 | 3 rd place, Stapp Association Student Paper Award, 2007 Stapp Car Crash Conf. |
| 2006 | Y.C. Fung Young Investigator Award, ASME. |
| 2006-2011 | NSF CAREER Award. |
| 2006 | Ford Motor Company Award for Faculty Advising, University of Pennsylvania. |
| 2005 | John Paul Stapp Award, Best Paper of 2004 Stapp Car Crash Conference. |
| 2004 | Stapp Association Award, Best Student Paper, 2004 Stapp Car Crash Conference. |
| 2003-2005 | Whitaker Foundation Young Investigator Research Award. |
| 2002-2006 | NIH Research Career Award (K01). |
| 2001-2002 | NIH NRSA Postdoctoral Fellowship. |
| 2002 | Dannemiller Memorial Educational Foundation selected paper for AnalgesiaFile. |
| 2001 | Medtronic Sofamor-Danek Award, Best Basic Science Paper, International Society for the Study of the Lumbar Spine Annual Meeting. |
| 2000 | Stapp Association Award, Best Student Paper, 2000 Stapp Car Crash Conference. |
| 1999 | Stapp Association Award, Best Student Paper, 1999 Stapp Car Crash Conference. |
| 1997 | Arnold W. Siegel Award, Most Outstanding Paper, Stapp Car Crash Conference. |
| 1993-1996 | National Science Foundation Fellowship. |
| 1993 | Cum Laude, University of Pennsylvania. |
| 1992 | E. Stuart Eichart, Jr. Alumni Award, University of Pennsylvania. |
| 1989-1993 | Benjamin Franklin Scholar, University of Pennsylvania. |

PROFESSIONAL SOCIETY MEMBERSHIPS:

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| 2011-Present | International Association for the Study of Pain |
| 2010-2011 | New York Academy of Sciences |
| 2010-Present | Cervical Spine Research Society |
| 2007-2014 | Association for the Advancement of Automotive Medicine |
| 2007-2011 | Association for Women in Science |
| 2005-Present | Biomedical Engineering Society |
| 2001-Present | Orthopaedic Research Society |
| 2000-Present | Society for Neuroscience |
| 1997-Present | American Society of Mechanical Engineers |
| 1997-2001 | Society of Automotive Engineers |
| 1995-2011 | American Society of Biomechanics |

EDITORIAL ACTIVITIES:

Editor, Journal of Biomechanical Engineering (2012-present)
 Executive Editor, Journal of Bioengineering & Biomedical Science (2010-2013)
 Associate Editor, Journal of Biomechanical Engineering (2009-2012)
 Associate Editorial Board, Spine (2008-present)
 Advisory Panel, **Neck Injury Biomechanics Compendium**, J Pike (Ed.), SAE International, 2009.

BOOKS:

Winkelstein BA, *Orthopaedic Biomechanics*, Boca Raton, FL: CRC Press Taylor & Francis, 2012.

JOURNAL REVIEWER ACTIVITIES (2000-present):

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| Anatomical Record | Journal of Biomechanical Engineering |
| Annals of Biomedical Engineering | Journal of Biomechanics |
| Arthritis Research & Therapy | Journal of Manipulative & Physiological Therapeutics |
| Biomaterials | |
| Biomechanics & Modeling in Mechanobiology | Journal of the Mechanical Behavior of Biomedical Materials |
| BioResearch Open Access | Journal of Medical Devices |
| Behavioural Brain Research | Journal of Molecular Neuroscience |
| Brain, Behavior, & Immunity | Journal of Neuroinflammation |
| Cellular and Molecular Neurobiology | Journal of Neurophysiology |
| Clinical Orthopaedics & Related Research | Journal of Neuroscience |
| Computers in Biology and Medicine | Journal of Neuroscience Methods |
| Experimental Brain Research | Journal of Neurotrauma |
| Expert Review of Neurotherapeutics | Journal of Orthopaedic Research |
| European Journal of Pain | Journal of Pain |
| European Journal of Pharmacology | Journal of the Royal Society Interface |
| European Spine Journal | Journal of Sport & Health Science |
| Fundamental & Clinical Pharmacology | Journal of Vibration and Acoustics |
| International Journal of Clinical Rheumatology | Medical & Biological Engineering & Computing |
| Journal of American Association for Laboratory Animal Science | Medical Engineering & Physics |
| | Molecular & Cellular Neuroscience |

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| Molecular Pain | Pain |
| Molecular Pharmaceutics | Peptides |
| Muscle & Nerve | Physiology & Behavior |
| Nature Reviews Rheumatology | PLOSOne |
| Nature – Scientific Reports | PNAS |
| Neuromodulation: Technology at the Interface | Science |
| Neuroscience | Science Translational Medicine |
| Neuroscience Letters | Spine |
| Neurotherapeutics | Stapp Car Crash Journal |
| Osteoarthritis & Cartilage | The Spine Journal |
| | Traffic Injury Prevention |

PROFESSIONAL SOCIETY ACTIVITIES & CONFERENCE ORGANIZATION:

Chair, PhD Paper Competition, *ASME Bioengineering Conference*, 2006, 2007.
 Education Committee, *ASME Bioengineering Division*, 2006 – 2009.
 Solid Mechanics Technical Committee, *ASME Bioengineering Division*, 2006 – Present.
 Student Paper Competition Review Committee, *Stapp Car Crash Conference*, 2007 – 2012.
 Chair, Student Paper Competition, *ASME Summer Bioengineering Conference*, 2008.
 YC Fung Young Investigator Award Committee, *ASME-Bioengineering Division*, 2008 – 2014.
 Co-Chair, Orthopedics & Rehabilitation Engineering Track, *BMES Annual Meeting*, 2009.
ASME NIH Task Force & Inter-Sector Committee on Federal R & D, 2010-2013.
 Co-Organizer, *New York Academy of Sciences BPDG Symposium*, 2010.
 Organizer, Facet Mechanics Symposium, *6th World Congress of Biomechanics*, Singapore, 2010.
 Organizing Committee, *ASME Society-Wide Micro/Nano Technology Forum*, 2010, 2011.
 Publications Chair, *ASME Summer Bioengineering Conference*, 2011.
 International Program Committee, *IASTED Biomech 2011 Conference*, 2011.
 Education Committee, *Biomedical Engineering Society*, 2011 – 2013.
 Scientific Program Committee, *Association for the Advancement of Automotive Medicine*, 2011 – 2014.
 Seed Starter Grant Sub Committee, *Cervical Spine Research Society*, 2013 – 2016.
 Co-Chair, Biomechanics Track, *BMES Annual Meeting*, 2014.
 Board of Directors, *Biomedical Engineering Society*, 2016-2019.

CONFERENCE SESSIONS CHAIRED:

Skeletal: Injury Biomechanics, *ASME Summer Meeting*, Key Biscayne FL, 2003.
 Joint Biomechanics/Human Movement, *BMES Meeting*, Philadelphia PA, 2004.
 Soft Tissue Mechanics, *BMES Meeting*, Baltimore MD, 2005.
 Disc Mechanics, *ASME Summer Bioengineering Conference*, Amelia Island FL, 2006.
 Chair, PhD Paper Competition, *ASME Summer Bioengineering Conference*, 2006, 2007.
 Whiplash & Neck Injury Biomechanics, *5th World Congress of Biomechanics*, Munich, 2006.
 Spine II, *ASME Summer Bioengineering Conference*, Keystone CO, 2007.
 Spine Regenerative Medicine, *Fall Meeting of Philadelphia Spine Research Society*, 2007.
 Head & Neck Impact Response & Injury, *51st Stapp Car Crash Conference*, San Diego, CA, 2007.
 Biomechanics of Forensic Engineering, *ASME Summer Bioengineering Conf*, Marco Island FL, 2008.
 Pediatric & Pregnant Occupant Biomechanics, *52nd Stapp Car Crash Conference*, San Antonio, TX, 2008.
 Orthopedic Soft Tissue Biomechanics, *BMES Annual Meeting*, Pittsburgh, PA, 2009.
 Whiplash & Neck Injury Biomechanics, *6th World Congress of Biomechanics*, Singapore, 2010.
 Facet Mechanics, *6th World Congress of Biomechanics*, Singapore, 2010.

Head & Neck Injury Biomechanics & Anthropometry, *54th Stapp Car Crash Conf*, Scottsdale, AZ, 2010.
Spine Biomechanics, *Orthopaedic Research Society Annual Mtg*, Long Beach, CA, 2011.
Biomechanics of Injury, *ASME Summer Bioengineering Conf*, Nemaconlin, PA, 2011.
Workshop Panelist, Strategies for Postdocs & Early Investigators, *ASME Summer Bioengineering Conf*, Nemaconlin, PA, 2011.
Panel Discussion Leader, *5th International Whiplash Trauma Congress*, Lund, Sweden 2011.
Neural Engineering, *BMES Annual Meeting*, Hartford, CT, 2011.
Biomechanics of Injury, *ASME Summer Bioengineering Conf*, Fajardo, Puerto Rico, 2012.
Workshop Panelist, Tips for Tenure, *ASME Summer Bioengineering Conf*, Fajardo, Puerto Rico, 2012.
Injury II, *ASME Summer Bioengineering Conf*, Sunriver, OR, 2013.
Symposium: Basic and Clinical Evidence that Painful Lesions are Induced after Whiplash Injury, *8th Congress of the European Federation of the IASP Chapters*, Florence, Italy, 2013.
Injury Biomechanics, *57th Stapp Car Crash Conf*, Orlando, FL, 2013.
Spine Biomechanics Modeling, *7th World Congress of Biomechanics*, Boston, MA, 2014.
Spinal Facet Biomechanics, *7th World Congress of Biomechanics*, Boston, MA, 2014.
In Vitro Models of Organ Biomechanics, *7th World Congress of Biomechanics*, Boston, MA, 2014.
Challenges & Opportunities in University Space for High Impact Teaching, *AAU STEM Initiative Conference*, Washington DC, 2014.
Head Injury Biomechanics, *BMES Annual Meeting*, San Antonio, TX, 2014.
Pain, *BMES Annual Meeting*, San Antonio, TX, 2014.
Workshop Panelist, Critical Steps in Composing a Successful Mentorship Plan, *Summer Biomechanics, Bioengineering & Biotransport Conference*, Snowbird, UT, 2015.
Workshop Mentor, Mentee-Mentor Matching Mixer & Best Practices in Mentoring, *Summer Biomechanics, Bioengineering & Biotransport Conference*, Snowbird, UT, 2015.
Spine Peripheral Nerve & Spinal Cord Injury, *Orthopaedic Research Society Ann Mtg*, Orlando, FL, 2016.
Disc: Degeneration & Pain, *World Forum for Spine Research*, Dubai, UAE, 2016.
Trauma: Cervical, *Global Spine Congress*, Dubai, UAE, 2016.
Workshop Mentor, Mentee-Mentor Matching Mixer & Best Practices in Mentoring, *Summer Biomechanics, Bioengineering & Biotransport Conference*, National Harbor, MD, 2016.
Intervertebral Disc and Spine, *BMES Annual Meeting*, Minneapolis, MN, 2016.
Spine Mechanics, *Summer Biomechanics, Bioengineering & Biotransport Conf*, Tucson, AZ, 2017.
Mechanosensing in Injury and Pain, *8th World Congress of Biomechanics*, Dublin, Ireland, 2018.

PROFESSIONAL SOCIETY REVIEWER ACTIVITIES:

Technical Paper Reviewer, Occupant Protection, *SAE, World Congress & Exhibition*, 2005, 2008 – 2010.
Abstract Reviewer, Orthopaedic Biomechanics, *ASME Bioengineering Conference*, 2006.
Abstract Reviewer, Spine, *ASME Summer Bioengineering Conference*, 2007.
Abstract Reviewer, Injury, *ASME Summer Bioengineering Conference*, 2009.
Abstract Reviewer, Student Paper Competition, *ASME Summer Bioengineering Conference*, 2009.
Abstract Reviewer, Orthopedic Soft-Tissue Biomechanics, *BMES Annual Meeting*, 2009.
Abstract Reviewer, *TMJ Bioengineering Conference*, 2009.
Abstract Reviewer, Other Solid Mechanics, *ASME Summer Bioengineering Conference*, 2010.
Abstract Reviewer, Spine, *Orthopaedic Research Society Annual Conference*, 2011.
Abstract Reviewer, Neural Engineering, *BMES Annual Meeting*, 2011.
Abstract Reviewer, *IATED Biomech 2011 Conference*, 2011.
Paper Reviewer, *AAAM Conference*, 2012, 2013.

Abstract Reviewer, Injury, *ASME Summer Bioengineering Conference*, 2012, 2013.
 Paper Reviewer, *ASME 11th Biennial Conference on Engineering Systems Design & Analysis*, 2012.
 Abstract Reviewer, Nerve & Spinal Cord Injury, *Orthopaedic Research Society Annual Conf*, 2013–2016.
 Abstract Reviewer, Biomechanics, *BMES Annual Meeting*, 2015.
 Abstract Reviewer, *Global Spine Congress & World Forum for Spine Research Meeting*, 2016.
 Abstract Reviewer, *AO SpineWeek*, 2016.
 Abstract Reviewer, Joint & Spine, *Summer Biomechanics, Bioengineering, & Biotransport Conf*, 2016, 2017.
 Abstract Reviewer, Injury, *Summer Biomechanics, Bioengineering, & Biotransport Conf*, 2016, 2017.
 Abstract Reviewer, Student Papers, *Summer Biomechanics, Bioengineering, & Biotransport Conf*, 2016.
 Abstract Reviewer, Pain Control in Spine Disease, *Orthopaedic Research Society Annual Conf*, 2018.
 Abstract Reviewer, Spinal Cord & Nerve Root Injury, *Orthopaedic Research Society Annual Conf*, 2018.

GRANT REVIEW ACTIVITIES:

Wellcome Trust Foundation – Training Fellowship & Program Grant Awards, 2002, 2005
 National Science Foundation Panel Review – CAREER Awards, 2002, 2011
 Natural Sciences & Engineering Research Council of Canada – CHRP Awards, 2003
 National Institutes of Health, NIBIB (ZRG1-EB01, ZEB1-OSRB01) – K & T32 Awards, 2003, 2004
 National Institutes of Health, (SCS) – ad hoc reviewer, 2005
 Health Research Board of Ireland – Research Program Grants, 2005
 Department of Veterans Affairs – Rehabilitation Research & Development, 2005
 National Science Foundation – Graduate Research Fellowship Program, 2006, 2009
 National Institutes of Health, (BDCN K-18S) – ad hoc reviewer, 2006
 National Institutes of Health, NCCAM (ZAT1 DB25, ZAT1 DB27) – ad hoc reviewer, 2006, 2007
 Catalan Agency for Health Technology Assessment & Research – Research Grants, 2007
 Prince Salman Centre for Disability Research – Research Grants, 2007
 AIBS – US Army Medical Research & Materiel Command (MOMRP)
 Brain & Spine Injury Hazards Program Review Panel, 2008
 RAD 3 – USAMRMC Grant Review, 2008
 National Institutes of Health, NCCAM (SBIR LD26) – ad hoc reviewer, 2008
 Dutch Arthritis Association, Reumafonds – Research Grants, 2009
 National Institutes of Health, (GDD) – ad hoc reviewer, 2009
 National Institutes of Health, (MOSS F15) – ad hoc reviewer, 2010
 National Institutes of Health, NCCAM (PCCTR, U19 awards) – ad hoc reviewer, 2010
 Department of Veterans Affairs, Rehabilitation Research & Development, ad hoc reviewer, 2010, 2014
 National Institutes of Health, (MRS) – ad hoc reviewer, 2011
 Czech Science Foundation – reviewer, 2011
 Natural Sciences & Engineering Research Council of Canada – Discovery Grants, 2012
 National Institutes of Health, (ANIE) – ad hoc reviewer, 2012
 Cervical Spine Research Society, Seed Starter Grants, 2013 – 2016
 Swedish Research Council, Ministry of Education and Science, Sweden – scientific expert panel, 2013
 American Heart Association, Brain Stroke–Basic Science – reviewer, 2013
 Swiss National Science Foundation, Division of Biology and Medicine – reviewer, 2013
 Natural Sciences & Engineering Research Council of Canada–Discovery Grants – reviewer, 2013, 2016
 Research Grants Council of Hong Kong – reviewer, 2014, 2015
 Orthopaedic Research and Education Foundation, Career Development Grant – reviewer 2016

Swedish Research Council, Research Environment Grants in Natural and Engineering Sciences – international scientific expert, 2017
National Institutes of Health, (NCCIH) – ad hoc reviewer, 2017

TEACHING EXPERIENCE:

University of Pennsylvania, Philadelphia, PA

ENGR 566 – Design of Appropriate Technologies for Point of Care Diagnostics (enrollment 7)
Spring 2014 & Fall 2014
ENGR 299 – Engineering Research (enrollment 17) Fall 2013
BE495/496 – Senior Design (enrollment 68, 92, 78, 80, 90) 2010-2015
BE 699 – Graduate Seminar Course (each of Fall/Spring Terms) 2011-2013
BE 200 – Introduction to Biomechanics & Biomaterials (enrollment 96, 117) Fall 2008, Fall 2009
BE 210 – Bioengineering Laboratory II (2 sections; total enrollment 92) Spring 2009
EAS 296 – Global Biomedical Service (faculty participant for Spring & Summer) 2007, 2009
BE/BFS 225 – Technology & Engineering in Medicine (enrollment 18, 23) Fall 2006, Spring 2008
BE 210 – Bioengineering Laboratory II (2 sections; enrollment 92,88,82,80) Spring 2004–2007
BE 505 – Quantitative Human Physiology (enrollment 34,15) Fall 2003, Fall 2004
BE 210 – Bioengineering Laboratory II (single section; enrollment 25) Spring 2003

Dartmouth College, Hanover, NH

Module Instructor, ENGS 56 – Introduction to Biomedical Engineering Spring 2001, 2002
Research Mentor, WISP Program 2001-2002

INSTITUTIONAL ADMINISTRATIVE RESPONSIBILITIES:

2015-Present Vice Provost for Education, University of Pennsylvania
2015 Co-Chair, Faculty Senate Nominating Committee, Penn
2014 Member, Consultative Committee, Appointment of Dean of School of Engineering and Applied Science, Penn
2013 Member, Consultative Committee, Appointment of Dean of Graduate School of Education, Penn
2012-2015 Associate Dean, Undergraduate Education, School of Engineering & Applied Science
2012-2014 Member, Steering Committee for Middle States Self Study, Penn
2012-2013 Chair, Working Group on Undergraduate Research for Middle States Self Study, Penn
2012-2013 Founding Director, Annual Bioengineering Graduate Research Symposium
2012 Member, Animal Research Committee
2012 Member, Faculty Senate Nominating Committee, Penn
2012 Member, Consultative Committee on Chair of Materials Science & Engineering, Penn
2011-2012 Chair, Bioengineering Graduate Group
2011-2012 Committee Member, Natural Science and Engineering Review Panel, University Research Foundation, Penn
2011 Member, Consultative Review Committee on Reappointment of Dean of School of Veterinary Medicine, Penn
2009-2012 Faculty Member, Comparative Medical & Molecular Genetics Training Grant, Penn
2009-Present Executive Committee, Neurosurgery Brain Injury Training Grant (T32), Penn
2009-2012 Member, Faculty Council on Access & Academic Support, Univ. of Penn
2008-2011 Director, Bioengineering Graduate Student Admissions & Recruiting
2008-Present Faculty Advisor, Biomedical Engineering Society, Penn Chapter

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| 2008-2010 | Member, Engineering Faculty Council, Univ. of Penn |
| 2008-2010 | Member, Senate Committee on Faculty & Academic Mission, Univ. of Penn |
| 2008 | Founding Director, Bioengineering Talks with Alumni Undergraduate Series |
| 2008 | Member, Neurosurgery Faculty Search – Spine, Univ. of Penn |
| 2007-2009 | Board Member, Student Disciplinary System, Univ. of Penn |
| 2007-2009 | Coordinator, Bioengineering Undergraduate Laboratory Curriculum |
| 2007-2010 | Member, Bioengineering Undergraduate Curriculum Committee |
| 2007-2010 | Member, Rachleff Engineering Scholars Faculty Committee, Univ. of Penn |
| 2007-2015 | Member, Animal Program Advisory Committee, Univ. of Penn |
| 2006-2007 | Animal Resources Review Committee, Univ. of Penn |
| 2006-2007 | Co-Director, Bioengineering Departmental Seminar Series |
| 2006-2007 | Member, Bioengineering Chair Search Committee |
| 2005-2011 | Executive Board, Benjamin Franklin Scholars Program, Univ. of Penn |
| 2004-2008 | Faculty Member, Penn Women Biomedical Society Faculty Chat Program |
| 2004-2007 | Member, IME Pilot Grant Review Committee, Univ. of Penn |
| 2003-2010 | Faculty Advisor, Society of Women Engineers, Penn Chapter |
| 2003-2007 | Director, Bioengineering MD/PhD Recruiting & Admissions |
| 2003-2006 | Member, Bioengineering Undergraduate Laboratory Committee |
| 2003 | Faculty Educator, Penn-Merck Summer Program, Univ. of Penn |
| 2002-2004 | Member, Bioengineering Graduate Recruiting & Admissions Committee |

CURRENT RESEARCH FUNDING:

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| <i>Source:</i> Penn Center for Musculoskeletal Disorders Core Seed Grant | 9/17-8/18 |
| <i>Title:</i> Effects of HIFs and Inflammation on Joint Structure in TMJ Pain Using μ CT Imaging | |
| <i>Role:</i> Co-PI (PI: E Granquist) | \$4,912 |
| <i>Source:</i> NIH, NINDS | 9/17-5/22 |
| <i>Title:</i> Targeted treatment for radiculopathy via engineering PLA2-responsive multifunctional micelles | |
| <i>Role:</i> Co-PI (PI: Z Cheng) | Total Direct Costs: \$656,250 |
| <i>Source:</i> Center for Targeted Therapeutics and Translational Nanomedicine | 2/17-1/18 |
| <i>Title:</i> Antioxidant porous polymersomes for treating neuropathy | |
| <i>Role:</i> Co-PI (PI: Z Cheng) | \$50,000 |
| <i>Source:</i> Oral and Maxillofacial Surgery Foundation | 1/17-12/17 |
| <i>Title:</i> Defining Mechanical Injury, Hypoxia, and Disease Progression in TMJ OA and Pain | |
| <i>Role:</i> Co-PI (PI: EJ Granquist) | \$75,000 |
| <i>Source:</i> Advanced Neuromodulation Systems, Inc. | 9/29/16-3/31/18 |
| <i>Title:</i> Brain & Spinal Cord Recordings with Novel Spinal Cord Stimulation Waveforms | |
| <i>Role:</i> PI | \$77,832 |
| <i>Source:</i> International Research Accelerator Scheme, University of Bath | 6/16-6/17 |
| <i>Title:</i> Patient-Specific Biomechanical Modelling of Spine Pathologies | |
| <i>Role:</i> International Partner | Total Costs: £8,000 |

Source: American Association of Oral & Maxillofacial Surgeons and the OsteoScience Foundation 6/16-6/17
Title: Biologic Imaging as an Aid to Time Tissue Regeneration
Role: Co-PI (Co-PI: EJ Granquist) *Total Costs:* \$5,000

Source: Cervical Spine Research Society 1/16-12/17
Title: PLA₂-Responsive Multifunctional Micelles for the Targeted Treatment of Painful Radiculopathy
Role: PI *Total Costs:* \$75,000

Source: Advanced Neuromodulation Systems, Inc. 6/23/15-3/31/18
Title: Importance of Charge and Pattern in WDR and HT Neurons
Role: PI \$72,650

Source: NIH, NIBIB/NCCIH (R21 AT064157)
Title: Novel Synthetic SDG to Treat Trauma-Induced Inflammation 1/15-12/17
Role: PI (Dual PI: M. Christofidou-Solomidou, CHOP) \$225,000

Source: SK Foundation 10/13- 8/17
Title: Deep Brain Stimulation Experimentation
Role: PI \$105,000

Source: NIH, NIAMS (R01 AR064157)
Title: Notochordal Cell Derived Therapies for Painful Disc Degeneration 8/13-7/18
Role: PI of Penn Sub-Contract (PI: J. Iatridis, Mt. Sinai) Penn Direct Costs \$59,210

Source: NIH, NIBIB (U01 EB016638)
Title: Multiscale Modeling of Facet Capsule Mechanobiology 7/13-6/18
Role: PI (Dual PI: V. Barocas, UMN) Penn Direct Costs \$736,000/over 5 years

Source: Association of American Universities/Helmsley Charitable Trust 9/1/13-8/31/17
Title: AAU STEM Initiative
Role: PI (PI: D. DeTurck) \$500,000

Source: St. Jude Medical, Inc. 12/12-9/17
Title: Defining Effects of Spinal Cord Stimulation on Thalamic Modulation of Painful Radiculopathy
Role: PI \$59,600

Source: Catherine D. Sharpe Foundation Award 9/13-8/18
Title: Defining Injury Mechanisms, Identifying Effective Interventions & Implementing Safe Treatment for the Spine: Integrating Biomechanics & Neurosurgery
Role: Co-PI (Co-PI: Welch) *Total Costs:* \$500,000

PAST RESEARCH FUNDING:
Source: DOD, CDMRP- TDA (#OR090496) 9/10-10/16 (NCE)
Title: Development of a Novel Translational Model of Vibration Injury to the Spine to Study Acute Injury in Vivo
Role: PI: Winkelstein (Co-I: Welch) *Total Direct Costs:* \$1,998,755

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| <i>Source:</i> NIH, NIAMS (R01 AR056288) | 4/09-3/16 (NCE) |
| <i>Title:</i> Nociceptive Mechanisms in Whiplash Injury | <i>Total Direct Costs:</i> \$969,123 |
| <i>Role:</i> PI | Percentile: 1.4% |
| <i>Source:</i> NIH, NIAMS (BIRT AR551895) | 7/10-3/16 (NCE) |
| <i>Title:</i> Building Interdisciplinary Research Teams | |
| <i>Role:</i> PI: Winkelstein (Co-I: Golder) | <i>Total Direct Costs:</i> \$100,000 |
| <i>Source:</i> Vice Provost for Global Initiatives (University of Pennsylvania) | 12/12-12/14 |
| <i>Title:</i> Design of Appropriate Biomedical Technologies for Point of Care Diagnostics in Sub-Saharan Africa | |
| <i>Role:</i> PI | \$25,000 |
| <i>Source:</i> Cervical Spine Research Society | 1/12-12/14 |
| <i>Title:</i> A Novel Bioengineered Biomaterial to Treat Painful Neural Trauma via Modified Thrombin Activity for Improving Neuronal Function & Treating Pain | |
| <i>Role:</i> PI | <i>Total Costs:</i> \$75,000 |
| <i>Source:</i> US Army Research (W911NF-07-D-0001) | 9/11-10/14 |
| <i>Title:</i> Cervical Spine Human Surrogate Mechanical Investigations | |
| <i>Role:</i> PI: Winkelstein (Co-I: Welch) | <i>Total Direct Costs:</i> \$149,703 |
| <i>Source:</i> Oral and Maxillofacial Surgery Foundation | 1/13-12/14 |
| <i>Title:</i> PET/CT for the Diagnosis/Prognosis of TMJ Osteoarthritis | |
| <i>Role:</i> Co-PI (PI: EJ Granquist) | \$75,000 |
| <i>Source:</i> Army Research Office (Defense University Research Instrumentation Program) | |
| <i>Title:</i> Biaxial Test System for Biomechanical Testing in Trauma Research | 7/13-10/14 |
| <i>Role:</i> PI | \$83,081 |
| <i>Source:</i> St. Jude Medical, Inc. | 12/12-12/13 |
| <i>Title:</i> SCS Programming: Acute Extracellular Recordings | |
| <i>Role:</i> PI | \$37,087 |
| <i>Source:</i> Provost's Interdisciplinary Seminar Fund (University of Pennsylvania) | 12/12-12/13 |
| <i>Title:</i> Challenges & Opportunities in Pain: Interdisciplinary Approaches to Effective Therapies | |
| <i>Role:</i> PI (Conference Grant) | \$35,000 |
| <i>Source:</i> Catherine D. Sharpe Foundation Award | 6/08-9/13 |
| <i>Title:</i> Defining Injury Mechanisms, Identifying Effective Interventions & Implementing Safe Treatment for the Spine: Integrating Biomechanics & Neurosurgery | |
| <i>Role:</i> Co-PI of Sub-Contract (Program PI: Grady) | <i>Total Costs:</i> \$450,000 |
| <i>Source:</i> NSF, BES (CAREER 0547451) | 7/06-6/13 |
| <i>Title:</i> Biomechanics of Neck Pain: Does Form Dictate Function? | <i>Total Direct Costs:</i> \$402,000 |
| <i>Role:</i> PI | |
| <i>Source:</i> NSF-GOALI Award | 2/08-6/13 |
| <i>Role:</i> PI (Co-PI: Whiteside, Wyeth) | <i>Total Costs:</i> \$15,000 |

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| <i>Source:</i> Foerderer Award | 8/11-7/12 |
| <i>Title:</i> Mechanisms of Chronic Pain During Development | |
| <i>Role:</i> Collaborator (PI: Barr; CHOP) | <i>Total Costs:</i> \$49,616 |
| <i>Source:</i> DOD, CDMRP-HDA (#OR090700) | 9/10-12/12 |
| <i>Title:</i> Salmon Thrombin as a Treatment to Attenuate Acute Pain & Promote Tissue Healing by Modulating Local Inflammation | |
| <i>Role:</i> PI: Winkelstein (Co-I: Janmey) | <i>Total Direct Costs:</i> \$100,000 |
| <i>Source:</i> Provost's Interdisciplinary Seminar Fund (University of Pennsylvania) | 8/11-12/12 |
| <i>Title:</i> The Penn Interdisciplinary Pain Seminar Series | |
| <i>Role:</i> PI | \$9,000 |
| <i>Source:</i> University Research Foundation Award (University of Pennsylvania) | 3/10-9/11 |
| <i>Title:</i> Electrophysiological Methods for Understanding Chronic Pain in Vivo | |
| <i>Role:</i> PI | \$40,000 |
| <i>Source:</i> Synthes Spine Co., USA (sponsored research agreement) | 8/08-2/11 |
| <i>Title:</i> Characterization of Cervical Facet Joint Pressures During Normal Spine Motions & following Surgical Intervention: A Cadaveric Study | |
| <i>Role:</i> Co-PI (Co-PI: Schuster) | <i>Total Costs:</i> \$77,400 |
| <i>Source:</i> Army Research Office (Defense University Research Instrumentation Program) | |
| <i>Title:</i> Integrated Imaging & Neurophysiology Workstation for Trauma Research | 6/09-5/10 |
| <i>Role:</i> PI | \$83,000 |
| <i>Source:</i> NSF-CHOP Center for Child Injury Prevention Research (PI) | 5/08-11/09 |
| <i>Title:</i> Painful Spine Injury in Children and Young Adults: Integrated Biomechanics and Pain Modeling | |
| | <i>Total Costs:</i> \$50,000 |
| <i>Source:</i> CDC, NCIPC (R49 CE000689) | 8/31/05-8/30/09 |
| <i>Title:</i> Biomechanical Mechanisms of Facet-Mediated Whiplash Injury & Pain | |
| <i>Role:</i> PI | <i>Total Direct Costs:</i> \$599,991 |
| <i>Source:</i> NIH, NIDCR (R21 DE017817) | 7/1/06-6/30/09 |
| <i>Title:</i> A Novel Model of TMJ Osteoarthritis to Define Glial Reactivity in Chronic Pain | |
| <i>Role:</i> PI (Co-PIs: Nicoll, Akintoye) | <i>Total Direct Costs:</i> \$275,000 |
| <i>Source:</i> Cervical Spine Research Society | 1/08-6/09 |
| <i>Title:</i> Novel Imaging Approach Using 3D Stress MRI to Detect Altered Biomechanics in Patients with Evoked Neck Pain | |
| <i>Role:</i> PI | <i>Total Costs:</i> \$60,310 |
| <i>Source:</i> Synthes Spine Co., USA (sponsored research agreement) | 4/07-6/08 |
| <i>Title:</i> Characterization of Cervical Facet Joint Biomechanics with Progressive Spinal Degeneration & Surgical Interventions: A Pilot Cadaveric Study | |
| <i>Role:</i> Co-PI (Co-PI: Schuster) | <i>Total Costs:</i> \$62,000 |

- Source:* Catherine D. Sharpe Foundation Award 2/03-5/08
Title: Understanding Painful Neck Injuries: Integration of Spine
 Biomechanics with Neurosurgical Approaches for Diagnosis & Treatment
Role: PI of Bioengineering Sub-Contract (Program PI: Grady) *Total Direct Costs:* \$400,000
- Source:* Southern Consortium for Injury Biomechanics (NHTSA) 5/05-4/08
Title: Injury Mechanisms of Facet-Mediated Whiplash Neck Pain *Total Costs:* \$299,877
Role: PI
- Source:* Japan Automobile Research Institute 3/15/06-12/31/06
Title: Defining Cervical Facet Kinematics for Combined Shear, Compression &
 Axial Pretorque of Vertebral Motion Segments
Role: PI *Total Costs:* \$70,000
- Source:* Whitaker Foundation Biomedical Engineering Grant (#RG-02-0311) 1/1/03-12/31/06
Title: Understanding the Mechanical Role of the Cervical Facet Joint in Neck Pain:
 Biomechanics & Nociceptive Responses in an *In Vivo* Model *Total Costs:* \$239,998
Role: PI
- Source:* NIH, K01 Research Career Award (AR47564-01) 9/1/02-8/31/06
Title: Local Tissue Biomechanics in Low Back & Radicular Pain *Total Costs:* \$366,703
Role: PI
- Source:* University of Pennsylvania, Institute for Medicine & Engineering 4/1/04-3/31/05
Title: Developing an Interdisciplinary Understanding of Facet-Mediated Neck Pain:
 Defining the Relationship Between Biomechanics & NK-1 Receptor Expression in the CNS
Role: Co-PI (Co-PI: Commons) *Total Costs:* \$20,000
- Source:* Synthes, USA 7/01/02-6/31/03
Title: Biomechanics of the Cervicothoracic Junction Using Kinematic Computerized Tomography
Role: Co-PI (PI: Grady) *Total Direct Costs:* \$45,000
- Source:* NIH, Individual National Research Service Award (F32-NS11161-1) 3/01/01-6/30/02
Title: Role of Biomechanics/Neural Plasticity in Radicular Pain *Total Costs:* \$113,448

RESEARCH SUPERVISION:

Doctoral Students

- Raymond Hubbard (Product Development Engineer, Integra LifeSciences) Defended 3/08
 National Science Foundation Fellowship, Ashton Fellowship
 1st place, PhD Podium, Student Paper Competition, ASME Bioengineering Conf, 2006
 Solomon R. Pollack Award for Excellence in Bioengineering, 2008
 1st place, Stapp Association Student Paper Competition, 2008
- Kathryn Lee (Consultant, Frankel Group) Defended 11/08
 National Science Foundation Fellowship
 1st place, Stapp Association Student Paper Competition, 2004
- Sarah Rothman (Senior Research Biologist, Neurodegeneration; Merck) Defended 4/09
 National Neurotrauma Society Travel Fellowship, 2005
 Recipient, National Research Council Post-Doctoral Fellowship, 2009
- Kyle Quinn (Assistant Professor, University of Arkansas) Defended 7/10

Fellowship, Association for the Advancement of Automotive Medicine, 2008
 3rd place, Stapp Association Student Paper Competition, 2007
 1st place, Stapp Association Student Paper Competition, 2008
 Solomon R. Pollack Award for Excellence in Bioengineering, 2011
 Ling Dong (Associate Manager, Genentech) Defended 10/11
 BE Department GAANN Fellowship, 2006-2007
 Honorable Mention, Student Paper Competition, ASME Bioengineering Conf, 2007
 Kristen Nicholson (Spine Research Medical Writer, Rothman Institute) Defended 7/13
 Ashton Fellowship
 Honorable Mention, National Science Foundation Fellowship, 2009
 Biomedical Engineering Society Student Travel Award, 2009
 2nd place, Stapp Association Student Paper Competition, 2011
 Finalist, Student Paper Competition, ASME Bioengineering Conf, 2013
 1st place, Basic Science Paper, Cervical Spine Research Society, 2013
 Nathan Crosby (Research Project Manager, SPR Therapeutics) Defended 9/14
 Ashton Fellowship
 Honorable Mention, National Science Foundation Fellowship, 2011
 Jeffrey Kras (Scientist, Integra LifeSciences) Defended 3/15
 BE Department GAANN Fellowship, 2008-2009
 Biomedical Engineering Society Student Travel Award, 2009
 3rd place, Basic Science Paper, Cervical Spine Research Society, 2014
 Jenell Smith (Senior Scientist, Longevity Biotech) Defended 11/15
 Ashton Fellowship
 Finalist, Student Paper Competition, ASME Bioengineering Conf, 2011
 Pre-Doctoral Trainee, Orthopaedic Training Grant, 2013-2015
 1st place, Science Talk, Bioengineering Graduate Research Symposium, 2015
 1st place, Student Paper Competition, Summer Biomechanics, Bioengineering &
 Biotransport Conf, 2015
 Recipient, ASEE/NSF Post-Doctoral Fellowship, 2016
 Solomon R. Pollack Award for Excellence in Bioengineering, 2016
 Sijia Zhang (Postdoctoral Fellow, Altschuler Lab, UCSF) Defended 9/17
 2nd place, Stapp Association Student Paper Competition, 2013
 2nd place, Student Paper Competition, Summer Biomechanics, Bioengineering &
 Biotransport Conf, 2015
 Recipient, Force & Motion Scholarship, AMTI MultiAxis, 2016
 Finalist, Student Paper Competition, Summer Biomechanics, Bioengineering &
 Biotransport Conference, 2016
 Pre-Doctoral Trainee, Center for Engineering MechanoBiology, 2016-2017
 Meagan Ita 2014-Present
 Honorable Mention, National Science Foundation Fellowship, 2015
 Finalist, Student Paper Competition, Summer Biomechanics, Bioengineering &
 Biotransport Conference, 2016
 2nd place, Poster Competition, Penn Center for Musculoskeletal Disorders Annual
 Symposium, 2015
 Pre-Doctoral Trainee, Orthopaedic Training Grant, 2017-2018

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| Megan Sperry | 2015-Present |
| Pre-Doctoral Trainee, Orthopaedic Training Grant, 2015-2017 | |
| 2 nd place, Science Talk, Bioengineering Graduate Research Symposium, 2016 | |
| BMES Graduate Design and Research Award, 2017 | |
| Sonia Kartha | 2015-Present |
| 2 nd place, Science Talk, Bioengineering Graduate Research Symposium, 2016 | |
| Honorable Mention, National Science Foundation Fellowship, 2016, 2017 | |
| 1 st place, Student Paper Competition, Summer Biomechanics, Bioengineering & Biotransport Conference, 2016 | |
| 3 rd place, Poster Competition, Center for Targeted Therapeutics & Translational Nanomedicine Symposium, 2016 | |
| Finalist, Student Paper Competition, Summer Biomechanics, Bioengineering & Biotransport Conference, 2017 | |

Research Fellows

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|---|--------------|
| Scott Simon, MD (Neurosurgeon, Hamden, CT) | 2002-2003 |
| Zhong Huang, MD (pursuing PhD in Information Science, Drexel, PA) | 2006-2007 |
| Nadine Dunk, PhD (faculty, Humber College, Toronto, Canada) | 2008-2009 |
| Joel Bauman, MD (spine surgery fellow, New England Baptist Hospital) | 2008-2011 |
| Neurosurgery Research & Education Foundation Research Fellowship, 2009 | |
| Yu-Wen Chang, PhD (visiting scholar, Academia Sinica, Taiwan) | 2009-2010 |
| Nicolas Jaumard, PhD (Senior Development Engineer, Zimmer) | 2009-2015 |
| Trainee, Neurosurgery Training Grant, 2010-2012 | |
| La'Toya Latney, DVM | 2010-2014 |
| Trainee, Comparative Medical and Molecular Genetics Training Grant | |
| Eric Granquist, DMD, MD | 2011-2013 |
| Peter Syré, MD | 2011-2013 |
| Trainee, Neurosurgery Training Grant, 2012-present | |
| Resident Research Award, 24 th Annual Pan Philadelphia Neurosurgery Conference, 2012 | |
| Kosuke Tanaka, DMD | 2011-2014 |
| Nadia Gharbi, DMD | 2012-2013 |
| Parul Sikand Pall, PhD | 2013-2014 |
| Blythe Philips, VMD | 2014-2015 |
| Kevin Seto, DMD | 2014-2015 |
| Timothy Holsgrove, PhD | 2014-2016 |
| Ya-Hsin Yu, DMD | 2015-2017 |
| Sagar Singh, PhD | 2016-present |
| Julia Quindlen, PhD | 2017-present |

Masters Students

| | |
|--|-----------|
| Boyang Tang | 2008 |
| Kiersten Craig (BE) (Analyst, Systems Integration Platform, Accenture) | 2008-2009 |
| 3 rd place, Student Paper Competition, ASME Bioengineering Conf, 2009 | |
| Derek Lee (BE) (Drexel Medical School) | 2010-2012 |
| Akhilesh Gokhale (MEAM) | 2010-2012 |
| Morgan Fox (BE) | 2011-2013 |
| Nadia Gharbi (Masters of Science in Oral Biology, Penn Dental) | 2012-2013 |

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| Hassam Baig (BE) | 2012-2013 |
| 3 rd place, Student Paper Competition, ASME Bioengineering Conf, 2013 | |
| Kosuke Tanaka (Masters of Science in Oral Biology, Penn Dental) | 2011-2014 |
| Ben Bulka (BE) | 2013-2015 |
| Kevin Seto (Masters of Science in Oral Biology, Penn Dental) | 2014-2015 |
| Ya-Hsin Yu (Masters of Science in Oral Biology, Penn Dental) | 2015-2017 |
| <i>Graduate Rotation Students</i> | |
| John Thinnies, "Design of a rodent spine loading device." | 2002-2003 |
| Cathryn Peltz, "Protocols for quantifying ligament fiber undulation." | Fall 2004 |
| Chris Dubois, "Detection of spinal neuropeptides in radicular pain." (recipient, Fontaine Fellowship) | 2004-2005 |
| Diana Santos, "Characterization of combined loading in facet distraction." (recipient, Fontaine Fellowship) | 2004-2005 |
| Amy Orlansky, "Defining spinal glial activation in a TMJ pain model." | Fall 2006 |
| Elena Tous, "Astrocyte transfection for detection of inducible cytokines." | Fall 2007 |
| Katherine Reuther, "Widespread spinal astrocytic responses in pain." | Fall 2009 |
| Dianne Weeks, "Brain activation in chronic pain." | Fall 2009 |
| Tristan Driscoll, "BKCa channels in pain." | Spring 2010 |
| Kalonda Johnson (recipient, Fontaine Fellowship, National Science Foundation Fellowship) | 2009-2010 |
| Lorre Atlan (recipient, Fontaine Fellowship) | Fall 2011 |
| Benjamin Freedman (recipient, National Science Foundation Fellowship) | Fall 2011 |
| Christine Yoon | Fall 2012 |
| Kevin Bui | Fall 2015 |
| Samantha Schumm | Fall 2015 |
| Joseph Newton | Fall 2016 |
| <i>Senior Design/Thesis</i> | |
| Chris Paryse, "Pressure characterization of microvascular clips." | Spring 2003 |
| Roanne Mejilla, "Device design for facet contour measurement." | 2003-2004 |
| Kathryn Keenan, Justin Mills, Liz Robinson "Design of multi-axis spine loading device." | 2004-2005 |
| David Gokhin, "Design of isolated rat ligament loading device." | 2004-2005 |
| Elizabeth Kim, "Lidocaine treatments for neck pain relief." | Spring 2005 |
| Pooja Sethi, "Quantification of disc pathology following applied spine flexion." | Fall 2005 |
| Ross Leimberg, "Species scaling for biomechanics: Of mice and men." | Fall 2005 |
| Andrew Franklin, Michelle Gupta, Will Marsh, "Design of dynamic facet loading device." | 2005-2006 |
| Vincent Cina, Kiersten Craig, Elizabeth Hines, Tefesehet Mesfin, "Design of system to provide delivery of sustained mouth-opening in multiple rats simultaneously." | 2007-2008 |
| Osama Ahmed, Mohammed Khan, Joan Jose Martinez, Robert Mozia, "Design of model system for optimal treatment of neuropathology from painful injury." | 2008-2009 |
| Chidi Ahaghotu, "Spinal glial activation in response to cytokine treatments." | 2009-2010 |
| Andrea Barberio, Elizabeth Green, Michael Czubakowski "Design of an MR compatible head positioning device." (winners, BE Senior Design Competition) | 2010-2011 |
| Jasmine Lee (Honors Senior Thesis in Biophysics) | 2015-2016 |
| Jessie Frank (Senior Thesis in Biological Basis of Behavior) | Fall 2016-2017 |

Independent Study

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|--|-------------|
| Andrea Tan, "NK-1 responses in facet-mediated pain." | 2004-2005 |
| Sahana Mysore, "Brain responses in persistent pain." | Spring 2005 |
| Gary Evans-Gaspar, "Tooth strength of AmelX null mice" | 2006-2007 |
| Vandana Sood, "Spinal serotonin in facet-mediated pain" (Blair Fellow) | 2008-2009 |
| Elizabeth Robinson, "Spinal regulation of CGRP mRNA in painful facet injury" | 2008-2009 |
| Chukwunyere Ahaghotu, "Temporal astrocyte morphology related to activation" | Spring 2009 |
| Melissa Cedarholm, "Computational biomechanics of a prosthetic interface" | Spring 2012 |

Undergraduate Researchers

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| Grant Arnold, "Design & development of an in vivo compression device." | Summer 2003 |
| David Gokhin, "Strain analysis techniques of the cervical facet capsule." (recipient, Spring 2004, Research Opportunities in Penn Engineering Award) | 2003-2004 |
| Andrew Franklin, "Design & use of rodent test-frames." | 2003-2005 |
| Robert Kreider, "Quantification of spinal neuropeptides in pain." | Summer 2004 |
| Andrea Tan, "NK-1 responses in facet-mediated pain." | Summer 2004 |
| Sarah Ghafurian, "Quantification of immunohistochemistry." | Summer 2005 |
| Cheryl Yang, "Geometric measurements of rodent ligaments." | Fall 2005 |
| Michelle Gupta, "Strain analysis of facet mechanics." | 2005-2006 |
| Liz Hines, "Kinematic measurements for spine motion segments." participant, NSF/AMP Program; 2 nd place oral presentation contest 2005, 1 st place 2006; 2 nd place poster contest 2007 | Summer 2005-2008 |
| Gary Evans-Gaspar, "Design of fixture & protocol for testing mice teeth" | Summer 2006 |
| Akriti Saxena, "Multiplex assays of spinal cytokines in pain" participant, University Scholars Program | Summer 2006 |
| Moses Tam, "Facet capsule strain & neurite outgrowth analysis." | Spring 2006-2008 |
| Chukwunyere Ahaghotu | Spring 2007-2008 |
| Joan Jose Martinez participant, NSF/AMP Program; 2 nd -place poster contest 2008 | Summer 2007-2008 |
| Vandana Sood recipient, Blair Fellowship, Fall 2008 | Summer 2007-2008 |
| Ben Guarino | Summer 2008-2010 |
| Sarah Hanna | Summer 2009 |
| Marc van de Rijn, "Astrocytic responses to fibrin gels." participant, Nano-Bio Interface Summer Program | Summer 2009 |
| Julia Quindlen | Spring 2010-2012 |
| Daniel Lipschutz | Spring 2010-2012 |
| Joshua Black awardee, Penn Undergraduate Research Mentorship Program, Summer 2010 | Summer 2010-2011 |
| Luis Medina participant, Nano-Bio Interface Summer Program | Summer 2011 |
| Taylor Gilliland awardee, Littlejohn Undergraduate Research Program, Summer 2013 | Fall 2011-2014 |
| Jasmine Lee | Fall 2012-present |
| Timothy Zhou, Rachleff Scholar | Fall 2012-2015 |
| Nina Zhu, Rachleff Scholar | Spring 2013-2015 |

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| Alec Stablow | Summer 2014-2016 |
| awardee, Penn Undergraduate Research Mentorship Program, Summer 2014 | |
| Angel Xiao | Summer 2014-2015 |
| awardee, Penn Undergraduate Research Mentorship Program, Summer 2014 | |
| Nicholas Stiansen | Summer 2015-present |
| awardee, Penn Undergraduate Research Mentorship Program, Summer 2015 | |
| Xavier Islam, Rachleff Scholar | Summer 2015 |
| awardee, Penn Undergraduate Research Mentorship Program, Summer 2015 | |
| Preston Eni, NSF/AMP Program | Summer 2016-2017 |
| Ethan Zhao, Rachleff Scholar | Summer 2016-2017 |
| awardee, Penn Undergraduate Research Mentorship Program, Summer 2016 | |
| Harrison Troché | Summer 2016-present |
| awardee, Penn Undergraduate Research Mentorship Program, Summer 2016 | |
| Vanessa Moody | January 2017-present |
| Alejandro Villasmil | Summer 2017-present |
| awardee, Abraham Noordegraaf Undergraduate Research Fellow Award, | Summer 2017 |
| Olivia Leavitt, REU student | Summer 2017 |

DOCTORAL THESIS COMMITTEES (not primary advisor):

Mari Allison (Arbogast), Bioengineering, defended 2015.
 Nelly Andarawis (Soslowky), Bioengineering (Committee Chair), defended 2008.
 Heather Ansoerge (Soslowky), Bioengineering (Committee Chair), defended 2010.
 Lorre Atlan (Margulies), Bioengineering (Committee Chair), defended 2017.
 Tim Bhatnagar (T. Oxland), Mechanical Engineering, University of British Columbia, 2015.
 Hallie Brink (Nicoll), Bioengineering (Committee Chair), defended 2008.
 John Boxberger (Elliott), Bioengineering (Committee Chair), defended 2009.
 Yung Chia Chen (Meaney), Bioengineering (Committee Chair), defended 2013.
 Brittany Coats (Margulies), Bioengineering, defended 2007.
 Michael DeRidder (Meaney), Bioengineering (Committee Chair), defended 2005.
 David Gabrieli (Meaney), Bioengineering
 Laurel Hind (Hammer), Bioengineering, defended 2015.
 Nicole Ibrahim (Margulies), Bioengineering (Committee Chair), defended 2009.
 Veronika Khariv (S. Elkabes & R.F.Heary), Biomedical Sciences, Rutgers (Outside Reader)
 Sarah Rooney (Soslowky), Bioengineering (Committee Chair), defended 2015.
 Varsha Jain (Wehrli), Bioengineering (Committee Chair), defended 2012.
 Wade Johannessen (Elliott), Bioengineering (Committee Chair), defended 2006.
 Kevah Laksari (Darvish), Mechanical Engineering, Temple University, defended 2009.
 Jiamin Liu (Udupa), Bioengineering (Committee Chair), defended 2006.
 John Martin (Mauck), Mechanical Engineering & Applied Mechanics (Committee Chair),
 defended 2015.
 Kris Miller (Soslowky), Bioengineering, defended 2012.
 William Miller (Meaney), Bioengineering (Committee Chair), defended 2007.
 William Olsen (Luo), Neuroscience
 Tapan Patel (Meaney), Bioengineering (Committee Chair), defended 2013.
 John Peloquin (Elliott), Bioengineering, defended 2016.
 Stephanie Perry (Soslowky), Bioengineering (Committee Chair), defended 2008.

Amber Price (Diamond), Bioengineering (Committee Chair), defended 2006.
 Brent Showalter (Elliott), Bioengineering (Committee Chair), defended 2015.
 Pallab Singh (Meaney), Bioengineering, defended 2011.
 Daniel Thorek (Tsourkas), Bioengineering (Committee Chair), defended 2009.
 Katie von Reyn (Meaney), Bioengineering (Committee Chair), defended 2010.
 Michael Wang (Reddy), Bioengineering, defended 2010.
 Jessamine Winer (Janmey), Bioengineering (Committee Chair), defended 2009.
 Jonathon Yoder (Elliott), Mechanical Engineering & Applied Mechanics, defended 2014.

INVITED PLENARY TALKS:

1. "Mechanisms of Central Sensitization, Neuroimmunology & Injury Biomechanics in Persistent Pain." *State-of-the-Art Research Symposium: Perspectives on Musculoskeletal Disorder Causation and Control*, National Institute for Occupational Safety & Health, Columbus, OH, May, 2003.
2. "Subfailure Injuries of the Neck: Implications for Whiplash and Pain." *International Whiplash Trauma Congress*, Breckenridge, CO, February, 2005.
3. "Mechanisms of Painful Injuries in the Neck: Defining Spinal Responses to Mechanical Injuries for Future Treatment Strategies." *Keynote: Molecular Bioscience Symposium of Petersheim Academic Exposition*, Seton Hall University, NJ, April, 2005.
4. "Painful Spinal Injuries: Biomechanics, CNS Neuroimmune Responses & Their Implications for Persistent Pain." *Human Factors & Ergonomics Society*, Delaware Valley Chapter, Philadelphia, PA, November, 2005.
5. "Mechanical & Physiological Pathologic Mechanisms of Painful Cervical Facet Capsule Injury." *International Whiplash Trauma Congress*, Portland, OR, June, 2006.
6. "Spine Pain Mechanisms – Where Does Back Pain Come From?" *Philadelphia Spine Research Society Annual Spring Meeting*, Philadelphia, PA, June, 2006.
7. "Biomechanics of Pain in Whiplash." *International Whiplash Trauma Congress*, Miami, FL, October, 2007.
8. "Theories of Neck Injury Mechanisms in Motor Vehicle Crashes." *World Congress on Neck Pain*, Los Angeles, CA, January, 2008.
9. "Biomechanics of Spine Trauma." *Annual Symposium of the American Society of Spine Radiology*, Indian Wells, CA, February, 2008.
10. "Nerve Root Compression in Acute & Chronic Radicular Pain: Mechanical Contributions to Local & Spinal Responses." *27th Annual Scientific Meeting of the American Pain Society*, Tampa, FL, May, 2008.
11. "Hints from Seasoned Study Section Members." *NIH – NCCAM Grantsmanship Workshop*, Bethesda, MD, June, 2008.
12. "Mechanisms of Traumatic Neck Pain." *Pain: Molecular to Community (M2C) Conference – Canada Training in Pain*, Quebec, Canada, June, 2009.
13. "Persistent Pain from Mechanical Joint Injury: Mechanistic Insights from Models of Whiplash & TMJ." *TMJ Bioengineering Conference*, Denver, CO, November, 2009.
14. "What is Spinal Injury? Considerations for Injury and Pain." *5th Annual Philadelphia Spine Research Symposium*, Philadelphia, PA, December, 2009.
15. "Neck Injury – What is it? How is it Diagnosed and Treated?" *18th Annual Meeting of the Rachidian Society*, Kona, HI, January, 2010.

16. "Biomechanics of Painful Injuries." *Injury Science Day*, University of Pennsylvania, Philadelphia, PA, March, 2010.
17. "Strategies For Developing Effective (& Relevant) Pre-Clinical Models of Pain: Relating Symptoms to Syndromes." *New York Academy of Sciences Symposium on Unmet Needs in Pain Therapeutics*, New York, NY, April, 2010.
18. "Spinal Facet Joint Anatomy & Biomechanics." *Facet Mechanics Symposium, 6th World Congress of Biomechanics*, Singapore, August, 2010.
19. "The Future of Neural Engineering." *40th Anniversary of the Department of Biomedical Engineering at Duke University*, Durham, NC, September, 2010.
20. "Glia, Inflammation & Pain." *Lyme & Other Tick-Borne Diseases Conference: The Science & Clinical Implications*, Philadelphia, PA, October, 2010.
21. "Animal Models in the Transition to Chronic Pain." *International Forum on Whiplash*, Queensland, Australia, February, 2011.
22. "How Can Animal Models Inform on Transition to Chronicity?" *International Whiplash Symposium 2011: How to Lessen the Transition to Chronicity*, Centre of Clinical Research Excellence, University of Queensland, Australia, February, 2011.
23. "Pre-Clinical Models of Back Pain" *4th Annual Targeting Pain with Novel Therapeutics Conference*, Philadelphia, PA, June, 2011.
24. "The Facet Joint as a Pain Generator in Neck Trauma." *5th International Whiplash Trauma Congress*, Lund, Sweden, August, 2011.
25. "Using Biomechanics to Define Physiologic Dysfunction – Revising Our Definition of Injury Tolerance." *Northeast Bioengineering Conference*, Philadelphia, PA, March, 2012.
26. "Acute to Chronic: What "Drives" Pain?" *International Whiplash Conference: 15 Year on: The Problem That has not Gone Away*, Bristol, UK, April, 2012.
27. "The Spinal Facet Joint and Musculoskeletal Pain." *2nd International Symposium on Musculoskeletal System & Pain*, Sapporo, Japan, July, 2012.
28. "Evidence of Pain from Cervical Spine Tissues & Associated Neuroplastic & Immune Changes in Physiological Model." *14th World Congress on Pain*, Milan, Italy, August, 2012.
29. "Underlying Factors of Musculoskeletal Disorders: What Are We Missing?" *Human Factors and Ergonomics Society 56th Annual Meeting*, Boston, MA, October, 2012.
30. "Neck Pain Mechanisms: Insights for Prevention & Treatment." *Evidence-Based Solutions for Improving Cervical Spine Health and Function*, Chicago, IL, March, 2013.
31. "Cervical Facet Joint Injury: Review of Animal Studies." *Canadian Pain Society Annual Conference*, Winnipeg, MB, Canada, May, 2013.
32. "Animal Models of Pain - "Back Translation" for Neck and Back Pain" *12th Annual World Pharma Congress*, Philadelphia, PA, June, 2013.
33. "Evidence of Pain from Cervical Spine Tissues: Associated Neuroplastic & Immune Changes in Physiological Models" *8th Congress of the European Federation of the IASP Chapters*, Florence, Italy, October, 2013.
34. "Mechanisms of Trauma-Induced Joint Pain and Insights for Diagnosis and Treatment." *Symposium on Challenges & Opportunities in Pain*, Philadelphia, PA, December, 2013.
35. "Biomechanics of Neurologic Injury" *Research Spotlight - Orthopaedic Research Society Annual Meeting*, New Orleans, LA, March, 2014.
36. "Pain Signaling from Injured Cervical Facet Joints" *Whiplash Injury: A Model for Development of Chronic Pain – IASP Research Symposium*, Aarhus, Denmark, March, 2014.

37. "Cervical Facet Joint Biomechanics in Normal & Injury Conditions." *7th World Congress of Biomechanics*, Boston, MA, July, 2014.
38. "Painful Tissue Loading can Induce Widespread Inflammation via Integrated Mechanotransduction Cascades." *7th World Congress of Biomechanics*, Boston, MA, July, 2014.
39. "Neuronal Activity in the CNS Modulates Persistent Pain: Mechanisms & Therapeutic Potential." *BMES Annual Meeting*, San Antonio, TX, October, 2014.
40. "Pain Biomechanics." *Stapp Car Crash Conference Annual Meeting*, San Diego, CA, November, 2014.
41. "Mechanisms by which Spinal Neuronal Activity Modulates Persistent Pain & Manipulating them for Therapeutic Potential." *3rd Annual Minnesota Neuromodulation Symposium*, Minneapolis, MN, April, 2015.
42. "Mechanisms of Persistent Neck Pain." *Faculty of Pain Medicine Spring Meeting*, Queenstown, New Zealand, October 2015.
43. "Biomechanics of Neck Injury in Whiplash." *Faculty of Pain Medicine Spring Meeting*, Queenstown, New Zealand, October 2015.
44. "Pain: Insights from the Disc & Other Spinal Tissues." *World Forum for Spine Research*, Dubai, April 2016.
45. "What a Pain in the Neck! Understanding Biomechanics of Injury & Mechanotransduction of Pain to Bioengineer Treatments & Diagnostics." *Summer Biomechanics, Bioengineering and Biotransport Conference*, National Harbor, MD, July 2016.
46. "Moving (or Removing) the Needle for Improved Pain Treatments." *Gordon Research Conference on Musculoskeletal Biology and Bioengineering*, Andover, NH, August 2016.
47. "Spine Biomechanics: Experimental Approaches Can Provide a "Backbone" for Clinical Insight." *Spinal Research Framework Workshop*, Bath, England, January 2017.
48. "What a Pain in the Neck Whiplash is! Integrating Biomechanics of Injury & Mechanotransduction of Pain to Understand Mechanisms." *22nd Annual Scientific Conference of the Spine Research Institute of San Diego*, San Diego, CA, November 2018.

INVITED EXTERNAL DEPARTMENTAL SEMINARS & SYMPOSIA:

1. "Subcatastrophic Spinal Injuries: Biomechanics, Pain and Injury Mechanisms." *Bioengineering Seminar Series*, University of Pennsylvania, Philadelphia, PA, April, 2001.
2. "Biomechanics and Physiology of Radiculopathy and Other Painful Spinal Injuries." *Neurology Grand Rounds*, Dartmouth-Hitchcock Medical Center, Lebanon, NH, July, 2001.
3. "Painful Spinal Injuries: Biomechanics, Pain and Injury Mechanisms." *Department of Orthopaedics Research Seminar Series*, Brown University, Providence, RI, August, 2001.
4. "The Role of Neuroimmunity in Persistent Pain: CNS Responses and Biomechanical Implications." *CNS Injury Seminar*, University of Pennsylvania, Philadelphia, PA, September, 2001.
5. "CNS Neuroimmune Responses and Biomechanical Implications in Persistent Pain." *Annual Orthopaedics/Spine Center Visiting Professor Lectureship Symposium*, Dartmouth-Hitchcock Medical Center, Lebanon, NH, October, 2001.
6. "Whiplash-Related Neck Pain: What Role Does the Cervical Facet Play?" *Neurosurgery Grand Rounds*, University of Pennsylvania, Philadelphia, PA, September, 2002.

7. "Lumbar Nerve Root Mechanics in Compression: Implications for Persistent Low Back Pain." *Mechanical Engineering Departmental Seminar Series*, University of Vermont, Burlington, VT, October, 2002.
8. "The Role of Local Biomechanics in Persistent Pain." *Institute for Medicine and Engineering Interdisciplinary Seminar Series*, University of Pennsylvania, Philadelphia, PA, February, 2003.
9. "Spinal Injury & Pain: Biomechanics, Neuroimmunity and Injury Mechanisms." *TraumaLink Seminar*, University of Pennsylvania, Philadelphia, PA, April, 2003.
10. "Spinal Pain Mechanisms: Understanding the Relationship Between Injury Mechanics & Immunology." *Neuroscience Program Seminar*, Temple University, Philadelphia, PA, October, 2003.
11. "Cervical Facet-Mediated Injury: Lessons from an In Vivo Model Integrating Biomechanics, Behavior & Nociception." *Department of Bioengineering*, Wayne State University, Detroit, MI, October, 2005.
12. "Mechanisms of Painful Nerve Root Injury: Integrating Tissue Mechanics with Cellular Reactivity to Understand Pain Symptoms." *Orthopaedic Surgery Grand Rounds*, Duke University Medical Center, Durham, NC, December, 2005.
13. "Defining Tolerances for Neck Pain: Mechanical & Physiological Considerations." *Department of Bioengineering*, Columbia University, New York, NY, January, 2006.
14. "Does Nerve Root Compression "Sting"? Understanding Neck Pain in the Context of Biomechanics and Nociceptive Cascades." *Center for Injury Biomechanics*, Virginia Tech/Wake Forest, Blacksburg, VA, April, 2006.
15. "Neck Pain: Biomechanics & Cellular Responses for Injury in the Cervical Spine." *Orthopaedics Department Grand Rounds*, Dartmouth-Hitchcock Medical Center, Lebanon, NH, May, 2006.
16. "Nerve Root Compression & Pain: Does Tissue Biomechanics Influence Injury Responses?" *Applied Biomechanics Laboratory*, University of Washington, Seattle, WA, May, 2006.
17. "Biomechanics of Subfailure Tissue Loading: Engineering Approaches to Understand & Treat Painful Injuries" *Center for Biomolecular & Tissue Engineering*, Duke University, Durham, NC, September, 2006.
18. "Biomechanics of Subfailure Tissue Loading: Considerations for Design & Retrofit." *Ergonomics Program Seminar Series in Biomedical & Mechanical Engineering & Kinesiology*, University of Michigan, Ann Arbor, MI, October, 2006.
19. "Novel In Vivo Models to Understand Mechanisms & Identify Treatments for Neck Pain." *Neuroscience Discovery Research Department*, Wyeth Pharmaceuticals, Princeton, NJ, November, 2006.
20. "Injury Mechanisms of Facet-Mediated Whiplash Neck Pain." *Southern Consortium for Injury Biomechanics Scientific Symposium*, Homewood, AL, December, 2006.
21. "An Integrated Approach to Understand Facet Pain: Biomechanics, Behavior & Nociception." *Department of Neurobiology & Anatomy*, Drexel University College of Medicine, Philadelphia, PA, February, 2007.
22. "Tissue Responses for Mechanical Neck Injury: Considerations for Pharmacological Treatments of Pain." *Department of Pharmacology*, Boston University School of Medicine, Boston, MA, April, 2007.

23. "Understanding Pain Responses in Neck Injuries to Develop Targeted Therapeutics." *Department of Chemical Engineering*, University of Louisville, Louisville, KY, November, 2007.
24. "Facet-Mediated Whiplash Neck Pain." *Southern Consortium for Injury Biomechanics Scientific Symposium*, Birmingham, AL, December, 2007.
25. "Neck Pain: Using Preclinical In Vivo Models to Define Mechanistic Cascades & Help Identify Effective Interventions." *Pain Research Department*, Abbott Pain Care, Chicago, IL, September, 2008.
26. "Re-Defining Mechanical Failure for Painful Neck Injury." *Department of Mechanical & Aerospace Engineering*, University of Virginia, Charlottesville, VA, February, 2009.
27. "An Engineering Approach to Diagnose & Treat Neck Pain." *Biomedical Engineering & Biomedical Sciences Program Joint Seminar*, University of South Carolina, Columbia, SC, March, 2009.
28. "An Integrated Approach to Define Biomechanical Tolerances for Injury, Pain & Cellular Dysfunction." *Department of Biomedical Engineering*, University of Minnesota, Minneapolis, MN, March, 2010.
29. *Department of Mechanical & Aerospace Engineering*, University of Virginia, Charlottesville, VA, May, 2010.
30. *ULAR Veterinary Series on Animal Models*, University of Pennsylvania, Philadelphia, PA, August, 2010.
31. "A Bioengineering Approach to Define Biomechanical Tolerances for Painful Injury & Cellular Dysfunction." *Department of Bioengineering*, The Pennsylvania State University, University Park, PA, October, 2010.
32. "Integration of Biomechanical Tissue Tolerances with Physiologic Responses for Facet-Mediated Pain." *Department of Orthopaedic Surgery*, Rush University, Chicago, IL, November, 2010.
33. "Mechanisms of Facet-Mediated Neck Pain: A Bioengineering Approach to Inform Clinical Management." *Department of Physical Therapy & Human Movement Sciences*, Northwestern University, Chicago, IL, November, 2011.
34. "Biomechanics, Injury & Tolerance." *Department of Computer Engineering*, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, May, 2012.
35. "Neck Pain Mechanisms: Insights for Prevention & Treatment." *Rehabilitation Institute of Chicago*, Chicago, IL, March, 2013.
36. "Bioengineering Approaches to Understand, Prevent and Treat Facet Joint Pain." *Center for Excellence in the Neurosciences*, University of New England, Biddeford, ME, July, 2013.
37. "Bioengineering Approaches to Define Biomechanical Tolerances for Tissue Injury, Pain & Neuronal Dysfunction." *Department of Mechanical Engineering & Materials Science*, Washington University, St. Louis, MO, September, 2013.
38. "An Engineering Approach to Understand & Treat Radicular Pain." *Department of Biomedical Engineering*, University of Florida, Gainesville, FL, January, 2014.
39. "Bioengineering Approaches to Understand Spine Injury & Pain: "Back" to the Basics & Integrating for the Future." *Department of Biomedical Engineering*, The Ohio State University, Columbus, OH, February, 2014.
40. "Biomechanics of Spinal Joint Injury: Considering All "Facets" Ranging from Tissue Tolerance to Pain & Dysfunction." *The School of Biomedical Engineering*, Colorado State University, Ft. Collins, CO, March, 2014.

41. “Bioengineering & Engineering Futures: Academics & Opportunities.” *Gashora Girls Academy*, Gashora, Rwanda, June, 2014.
42. “Facet Joint Pain: Multiscale Biomechanical Contributions to Tissue Injury & Neuronal Dysfunction.” *University of British Columbia*, Vancouver, Canada, January, 2015.
43. “An Engineering Approach to Radicular Pain: Understanding Mechanisms for Treatment & Diagnosis.” *JFK Neuroscience Institute*, Edison, NJ, February, 2015.
44. “Women in Biomedical Engineering.” *University of Minnesota*, Minneapolis, MN, April, 2015.
45. University of Iowa, rescheduling from April 2017.
46. University of Akron, Spring 2018.
47. Mt. Sinai, Spring 2018.

CONFERENCE PRESENTATIONS:

1. **Winkelstein BA**, Nightingale RW, Myers BS, “Impact Neck Injury Dynamics: Relationships Between Impact Surface, Cervical Spine Kinetics, and Injury Risk.” *6th Injury Prevention Through Biomechanics Symposium*, Detroit, MI, May, 1996.
2. **Winkelstein BA**, Myers BS, “Preliminary Results of a Mechanical Investigation of the Role of the Cervical Facet Capsule in Whiplash Injury.” *8th Injury Prevention Through Biomechanics Symposium*, Detroit, MI, May, 1998.
3. **Winkelstein BA**, Nightingale RW, Myers BS, “A Preliminary Study of the Biomechanics of the Cervical Facet Capsule.” *Whiplash '98 Symposium*, Tempe, AZ, November, 1998.
4. **Winkelstein BA**, Richardson WJ, Myers BS, “A Mechanical Investigation of the Role of the Cervical Facet Capsule in Whiplash Injury.” *ASME Summer Bioengineering Conference*, Big Sky, MT, June, 1999.
5. **Winkelstein BA**, Nightingale RW, Richardson WJ, Myers BS, “Cervical Facet Joint Mechanics: Its Application to Whiplash Injury.” *43rd Stapp Car Crash Conference*, San Diego, CA, October, 1999.
6. **Winkelstein BA**, Myers BS, “Experimental and Computational Characterization of Three-Dimensional Cervical Spine Flexibility.” *44th Stapp Car Crash Conference*, Atlanta, GA, November, 2000.
7. **Winkelstein BA**, Weinstein JN, Pahl JL, DeLeo JA, “Local Tissue Biomechanics in Lumbar Radiculopathy: A New Model Approach.” *Orthopaedic Research Society 47th Annual Meeting*, San Francisco, CA, February, 2001.
8. **Winkelstein BA**, Rutkowski MD, Weinstein JN, DeLeo JA, “An *In Vivo* Approach to Characterizing Local Biomechanics in a Radiculopathy Model.” *Annual Meeting of the International Society for the Study of the Lumbar Spine*, Edinburgh, Scotland, June, 2001.
9. **Winkelstein BA**, Rutkowski MD, DeLeo JA, “Chemokines in Neuropathic Pain: Potential Benefits for Modulating Pain by Targeting Their Actions.” *31st Annual New England Pharmacologists Meeting*, Hanover, NH, January, 2002.
10. **Winkelstein BA**, Rutkowski MD, Weinstein JN, DeLeo JA, “Temporal Responses in a Lumbar Radiculopathy Model: Tissue Biomechanics, Allodynia & Central Neuroimmune Changes.” *International Society for the Study of the Lumbar Spine Annual Meeting*, Cleveland, OH, May, 2002.
11. **Winkelstein BA**, Weinstein JN, DeLeo JA, “Role of Local Biomechanics in Temporal Behavioral Responses of Painful Radiculopathy.” *4th World Congress of Biomechanics*, #5057, Calgary, Canada, August, 2002.

12. **Winkelstein BA**, DeLeo JA, “The Role of Tissue Biomechanics in Painful Injuries: Mechanics, Cellular Responses and Pain Behaviors.” *ASME Summer Bioengineering Conference*, Key Biscayne, FL, June, 2003.
13. Lee KE, Thinnes JH, Gokhin D, **Winkelstein BA**, “In Vivo Biomechanics in a Facet-Mediated Neck Pain Model: Biomechanical Implications for Painful Whiplash Injuries.” *International Whiplash Trauma Conference*, Denver, CO, October, 2003.
14. **Winkelstein BA**, Hubbard RD, DeLeo JA, “Biomechanics and Painful Injuries: Tissue & CNS Responses for Nerve Root Mechanical Injuries.” *ASME International Mechanical Engineering Conference*, Washington DC, November, 2003.
15. Lee KE, Davis MB, Mejilla RM, **Winkelstein BA**, “In Vivo Cervical Facet Capsule Distraction: Mechanical Implications for Whiplash and Neck Pain.” *48th Stapp Car Crash Conference*, Nashville, TN, November, 2004.
16. Rothman SM, Kreider RA, **Winkelstein BA**, “Understanding Mechanisms of Painful Cervical Nerve Root Injury: Defining a Relationship between Persistent and Resolving Neck Pain Symptoms and Spinal Neuropeptide Responses.” *Cervical Spine Research Society 32nd Annual Meeting*, Paper #38, Boston, MA, December, 2004.
17. Lee KE, Gupta M, **Winkelstein BA**, “In Vivo Facet Capsule Failure in a Rat Model: Implications for Whiplash & Facet-Mediated Neck Pain.” *5th World Congress of Biomechanics*, #4489, Munich, Germany, July, 2006.
18. **Winkelstein BA**, Udupa JK, Hilibrand AS, Schuster JM, Siegler S, Hirsch BE, Borthakur A, Melhem ER, “Novel Imaging Approach Using 3D Stress MRI to Detect Altered Biomechanics in Patients with Evoked Neck Pain.” *Cervical Spine Research Society 36th Annual Meeting*, Austin, TX, December, 2008.
19. **Winkelstein BA**, Udupa JK, Hilibrand AS, Schuster JM, Siegler S, Hirsch BE, Borthakur A, Melhem ER. “Novel Imaging Approach Using 3D Stress MRI to Detect Altered Biomechanics in Neck Pain Patients.” *BMES Annual Fall Meeting*, #OP10-3-8D, Pittsburgh, PA, October 2009.
20. **Winkelstein BA**, Udupa JK, Hilibrand AS, Schuster JM, Siegler S, Hirsch BE, Borthakur A, Melhem ER. “A Novel 3D Stress MR Imaging Approach to Detect Altered Biomechanics in Neck Pain Patients.” *Cervical Spine Research Society Annual Meeting*, #17, Salt Lake City, UT, December 2009.
21. **Winkelstein BA**. Inflammatory Mechanisms Contributing to Cervical Radiculopathy. *18th Annual Meeting of the Rachidian Society*, Kona, HI, February, 2010.
- *22. **Winkelstein BA**, Weisshaar CL, Thorek DL, Hubbard RD, Tsourkas A. Macrophage as a Potential Biomarker for Imaging Radicular Pain. *Cervical Spine Research Society Annual Meeting*, Paper #15, Charlotte, NC, December 2010.
23. Smith JR, Weisshaar CL, Janmey PJ, **Winkelstein BA**. Salmon Thrombin Treatment Reduces Protease Activated Receptor 1 Expression Following Painful Nerve Root Injury. *Military Health System Research Symposium*, #12-141, Ft. Lauderdale, FL, August 2012.
24. Guarino BB, Baig HA, Jaumard NV, Branconi JL, Dorman DB, Shivers BL, **Winkelstein BA**. A New Model of Repeated Whole Body Vibration Exposure in the Rat: Biomechanical & Pain Responses. *Military Health System Research Symposium*, #12-023, Ft. Lauderdale, FL, August 2012.

* Paper received 1st Place, Best Basic Science Research Award at CSRS Meeting, 2010.

- ♦25. Nicholson KJ, Zhang S, **Winkelstein BA**. Riluzole Provides Neuroprotection against the Development of Axonal Damage and Spinal Hypersensitivity, While Abolishing Radicular Pain. *Cervical Spine Research Society Annual Meeting*, Paper #16, Los Angeles, CA, December 2013.
26. Crosby N, **Winkelstein BA**. Astrocyte Thrombospondin-4 May Mediate Painful Facet Capsule Injury: Insights from In Vivo and In Vitro Studies. *BMES Annual Meeting*, #OP-Fri-2-14, San Antonio, TX, October 2014.
- ♦27. **Winkelstein BA**, Kras JV. Intra-articular Nerve Growth Factor Initiates Pain and Associated Spinal Neuronal Hyperexcitability from Cervical Joint Pain. *Cervical Spine Research Society Annual Meeting*, Paper #17, Orlando, FL, December 2014.
28. Bulka BA, **Winkelstein BA**. Repeated Nonpainful Joint Loading Can Induce Behavioral Sensitivity: A Potential Mechanism of Joint-Mediated Pain. *Orthopaedic Research Society Annual Meeting*, Paper No. 0207, Las Vegas, NV, March 2015.
29. Crosby ND, Weisshaar CL, Smith JR, Zeeman ME, Goodman Keiser M, **Winkelstein BA**. GABAergic Mechanisms are Differentially Activated by Burst and Tonic Spinal Cord Stimulation to Attenuate Pain in a Rat Model of Cervical Radiculopathy. *International Neuromodulation Society World Congress*, #2182435, Montreal, Canada, June 2015.
30. Kartha S, Weisshaar CL, Tsourkas A, **Winkelstein BA**, Cheng Z. Antioxidant porous polymersomes to treat neuropathic pain. *BMES Annual Meeting*, Minneapolis, MN, October 2016.
31. Kartha S, Cheng Z, Tsourkas A, **Winkelstein BA**. PLA2-Responsive Multifunctional Micelles for the Targeted Treatment of Painful Radiculopathy. *Cervical Spine Research Society Annual Meeting*, Toronto, Canada, December 2016.
32. Weisshaar CL, Christofidou-Solomidou M, **Winkelstein BA**. Secoisolariciresinol diglucoside (SDG) attenuates mechanical hyperalgesia & spinal inflammation in a dose-dependent fashion in a rat model of painful radiculopathy. *Summer Biomechanics, Bioengineering & Biotransport Conference*, Tuscon, AZ, June 2017.

PUBLICATIONS IN REFEREED JOURNALS:

1. Meaney DF, Ross DT, **Winkelstein BA**, Brasko J, Goldstein D, Bilston LB, Thibault LE, Gennarelli TA. Modification of the cortical impact model to produce axonal injury in the rat cerebral cortex. *Journal of Neurotrauma*, 11(5):599-612, 1994.
- *2. Myers BS, **Winkelstein BA**. Epidemiology, classification, mechanism, and tolerance of human cervical spine injuries. *Critical Reviews in Biomedical Engineering*, 23(5&6):307-409, 1995.
3. **Winkelstein BA**, Myers BS. The biomechanics of cervical spine injury and implications for injury prevention. *Medicine & Science in Sports & Exercise*, 29(7):S246-55, 1997.
4. **Winkelstein BA**, Nightingale RW, Richardson WJ, Myers BS. The cervical facet capsule and its role in whiplash injury: A biomechanical investigation. *Spine*, 25(10):1238-1246, 2000.
5. **Winkelstein BA**, Myers BS. Experimental and computational characterization of three-dimensional cervical spine flexibility. *Stapp Car Crash Journal*, 44:139-158, 2000.

♦ Paper received 1st Place, Best Basic Science Research Award at CSRS Meeting, 2013.

♦ Paper received 3rd Place, Best Basic Science Research Award at CSRS Meeting, 2014.

* Invited paper.

- **6. Siegmund GP, Myers BS, Davis MB, Bohnet HF, **Winkelstein BA**. Human cervical motion segment flexibility and facet capsular ligament strain under combined posterior shear, extension & axial compression. *Stapp Car Crash Journal*, 44:159-170, 2000.
7. **Winkelstein BA**, McLendon RE, Barbir A, Myers BS. An anatomical investigation of the cervical facet capsule, quantifying muscle insertion area. *Journal of Anatomy*, 198:455-461, 2001.
8. **Winkelstein BA**, Rutkowski MD, Weinstein JN, DeLeo JA. Quantification of neural tissue injury in a rat radiculopathy model: Comparison of local deformation, behavioral outcomes, and spinal cytokine mRNA for two surgeons. *Journal of Neuroscience Methods*, 111(1):49-57, 2001.
9. Hunt JL, **Winkelstein BA**, Rutkowski MD, Weinstein JN, DeLeo JA. Repeated injury to the lumbar nerve roots produces enhanced mechanical allodynia and persistent spinal neuroinflammation. *Spine*, 26(19):2073-2079, 2001.
10. Siegmund GP, Myers BS, Davis MB, Bohnet HF, **Winkelstein BA**. Mechanical evidence of cervical facet capsule injury during whiplash: A cadaveric study using combined shear, compression and extension loading. *Spine*, 26(10):2095-2101, 2001.
11. **Winkelstein BA**, Rutkowski MD, Sweitzer SM, Pahl JL, DeLeo JA. Nerve injury proximal or distal to the DRG induces similar spinal glial activation and selective cytokine expression but differential behavioral responses to pharmacological treatment. *Journal of Comparative Neurology*, 439(2):127-139, 2001.
12. **Winkelstein BA**, Point-of-View Commentary on “Effect of Nucleus Pulposus on the Neural Activity of Dorsal Root Ganglion.” *Spine*, 26(8):944-945, 2001.
- ‡13. **Winkelstein BA**, Weinstein JN, DeLeo JA. The role of mechanical deformation in lumbar radiculopathy: An *in vivo* model. *Spine*, 27(1):27-33, 2002.
14. Nightingale RW, **Winkelstein BA**, Knaub KE, Richardson WJ, Luck JF, Myers BS. Comparative strengths and structural properties of the upper and lower cervical spine in flexion and extension. *Journal of Biomechanics*, 35(6):725-732, 2002.
15. Rutkowski MD, **Winkelstein BA**, Hickey WF, Pahl JL, DeLeo JA. Lumbar nerve root injury induces central nervous system neuroimmune activation and neuroinflammation in the rat: Relationship to painful radiculopathy. *Spine*, 27(15):1604-1613, 2002.
16. **Winkelstein BA**, Myers BS. Importance of nonlinear and multivariable flexibility coefficients in the prediction of human cervical spine motion. *Journal of Biomechanical Engineering*, 124(5):504-511, 2002.
- *17. DeLeo JA, **Winkelstein BA**. Physiology of chronic spinal pain syndromes: From animal models to biomechanics.” *Spine*, 27(22):2526-2537, 2002.
18. **Winkelstein BA**, DeLeo JA. Nerve root injury severity differentially modulates spinal glial activation in a rat lumbar radiculopathy model: Considerations for persistent pain. *Brain Research*, 956(2):294-301, 2002.
19. **Winkelstein BA**, Point-of-View Commentary on “Changes in spontaneous behavior in rats exposed to experimental disc herniation are blocked by selective TNF- α inhibition.” *Spine*, 28(15):1642, 2003.

** Paper received Stapp Association Award for Best Student Paper, 2000.

‡ Paper selected by Dannemiller Memorial Educational Foundation for Publication in *AnalgesiaFile*.

* Invited paper.

20. **Winkelstein BA**, DeLeo JA. Mechanical thresholds for initiation and persistence of pain following nerve root injury: Mechanical and chemical contributions at injury. *Journal of Biomechanical Engineering*, 126(2):258-263, 2004.
- *21. **Winkelstein BA**. Mechanisms of central sensitization, neuroimmunology & injury biomechanics in persistent pain: Implications for musculoskeletal disorders. *Journal of Electromyography & Kinesiology*, 14(1):87-93, 2004.
22. Lee KE, Thinnis JH, Gokhin DS, **Winkelstein BA**. A novel rodent neck pain model of facet-mediated behavioral hypersensitivity: Implications for persistent pain and whiplash injury. *Journal of Neuroscience Methods*, 137(2):151-159, 2004.
- §&23. Lee KE, Davis MB, Mejilla RM, **Winkelstein BA**. *In vivo* cervical facet capsule distraction: Mechanical implications for whiplash and neck pain. *Stapp Car Crash Journal*, 48:373-393, 2004.
24. Hubbard RD, **Winkelstein BA**. Transient cervical nerve root compression in the rat induces bilateral forepaw allodynia and spinal glial activation: Mechanical factors in painful neck injuries. *Spine*, 30(17):1924-1932, 2005.
- *25. Rothman SM, Kreider RA, **Winkelstein BA**. Spinal neuropeptide responses in persistent and transient pain following cervical nerve root injury. *Spine*, 30(22):2491-2496, 2005.
26. Simon S, Davis, M, Odner D, Udupa J, **Winkelstein B**. CT imaging techniques for describing motions of the cervicothoracic junction and cervical spine during flexion, extension and cervical traction. *Spine*, 31(1):44-50, 2006.
27. Lee KE, Franklin AN, Davis MB, **Winkelstein BA**. Tensile cervical facet capsule ligament mechanics: Failure and subfailure responses in the rat. *Journal of Biomechanics*, 39(7):1256-1264, 2006.
28. Quinn KP, **Winkelstein BA**. Cervical facet capsular ligament yield defines the threshold for injury and persistent joint-mediated neck pain. *Journal of Biomechanics*, 40(10):2299-2306, 2007.
- ‡29. Quinn KP, Lee KE, Ahaghotu CC, **Winkelstein BA**. Structural changes in the cervical facet capsular ligament: Potential contributions to pain following subfailure loading. *Stapp Car Crash Journal*, 51:169-187, 2007.
30. Rothman SM, **Winkelstein BA**. Chemical and mechanical nerve root insults induce differential behavioral sensitivity and glial activation that are enhanced in combination. *Brain Research*, 1181:30-43, 2007.
31. Hubbard RD, Chen Z, **Winkelstein BA**. Transient cervical nerve root compression load modulates pain: Load thresholds for allodynia and sustained changes in spinal neuropeptide expression. *Journal of Biomechanics*, 41(3):677-685, 2008.
32. **Winkelstein BA**, Santos DG. An intact facet capsular ligament modulates behavioral sensitivity and spinal glial activation produced by cervical facet joint tension. *Spine*, 33(8):856-862, 2008.
33. Siegmund GP, Davis MB, Quinn KP, Hines E, Myers BS, Ejima S, Ono K, Kamiji J, Yasuki T, **Winkelstein BA**. Head-turned postures increase the risk of cervical facet capsule injury during whiplash. *Spine*, 33(15):1643-1649, 2008.

* Invited paper.

§ Paper received Stapp Association Award for Best Student Paper, 2004.

& Paper received John Paul Stapp Award for Best Paper at 2004 Stapp Conference, 2005.

* Invited paper.

‡ Paper received 3rd place in Stapp Association Student Paper Competition, 2007.

34. Hubbard RD, **Winkelstein BA**. Dorsal root compression produces myelinated axonal degeneration near the biomechanical thresholds for mechanical behavioral sensitivity. *Experimental Neurology*, 212(2):482-489, 2008.
35. Liu J, Udupa JK, Saha PK, Odhner D, Hirsch BE, Siegler S, Simon S, **Winkelstein BA**. Rigid model-based 3D segmentation of the bones of joints in MR and CT images for motion analysis. *Medical Physics*, 35(8):3637-3649, 2008.
36. Dong L, Odeleye AO, Jordan-Sciutto KL, **Winkelstein BA**. Painful facet joint injury induces neuronal stress activation in the DRG: Implications for cellular mechanisms of pain. *Neuroscience Letters*, 443(2):90-94, 2008.
- ‡37. Hubbard RD, Quinn KP, Martinez JJ, **Winkelstein BA**. The role of graded nerve root compression on axonal damage, neuropeptide changes, and pain-related behaviors. *Stapp Car Crash Journal*, 52:33-58, 2008.
38. Quinn KP, **Winkelstein BA**. Altered collagen fiber kinematics define the onset of localized ligament damage during loading. *Journal of Applied Physiology*, 105(6):1881-1888, 2008.
39. Lee KE, Davis MB, **Winkelstein BA**. Capsular ligament involvement in the development of mechanical hyperalgesia after facet joint loading: behavioral and inflammatory outcomes in a rodent model of pain. *Journal of Neurotrauma*, 25(11):1383-1393, 2008.
40. Rothman SM, Huang Z, Lee KE, Weisshaar CL, **Winkelstein BA**. Cytokine mRNA expression in painful radiculopathy. *Journal of Pain*, 10(1):90-99, 2009.
41. Hubbard RD, Martinez JJ, Burdick JA, **Winkelstein BA**. Controlled release of GDNF reduces nerve root-mediated behavioral hypersensitivity. *Journal of Orthopaedic Research*, 27(1):120-127, 2009.
42. Lee KE, **Winkelstein BA**. Joint distraction magnitude is associated with different behavioral outcomes and substance P levels for cervical facet joint loading in the rat. *Journal of Pain*, 10(4):446-455, 2009.
43. Siegmund GP, **Winkelstein BA**, Ivancic PC, Svensson MY, Vasavada A. The anatomy and biomechanics of acute and chronic whiplash injury. *Traffic Injury Prevention*, 10:101-112, 2009.
44. Rothman SM, Guarino BB, **Winkelstein BA**. Spinal microglial proliferation is evident in a rat model of painful disc herniation both in the presence of behavioral hypersensitivity and following minocycline treatment sufficient to attenuate allodynia. *Journal of Neuroscience Research*, 87(12):2709-2717, 2009.
- *45. Quinn KP, **Winkelstein BA**. Vector correlation technique for pixel-wise detection of collagen fiber realignment during injurious tensile loading. *Journal of Biomedical Optics*, 14(5), 054010, 2009.
46. Dong L, **Winkelstein BA**. Simulated whiplash modulates expression of the glutamatergic system in the spinal cord suggesting spinal plasticity is associated with painful dynamic cervical facet loading. *Journal of Neurotrauma*, 27(1):163-174, 2010.
47. Rothman SM, Nicholson KJ, **Winkelstein BA**. Time-dependent mechanics and measures of glial activation and behavioral sensitivity in a rodent model of radiculopathy. *Journal of Neurotrauma*, 27(5):1-12, 2010.

‡ Paper received 1st place in Stapp Association Student Paper Competition, 2008.

* Paper selected for *Virtual Journal of Biological Physics Research*, published by the American Physical Society & the American Institute of Physics, compiling articles covering a focused area of frontier research.

48. Quinn KP, Bauman JA, Crosby ND, **Winkelstein BA**. Anomalous fiber realignment during tensile loading of the rat facet capsular ligament identifies mechanically induced damage and physiological dysfunction. *Journal of Biomechanics*, 43(10):1870-1875, 2010.
49. Rothman SM, **Winkelstein BA**. Cytokine antagonism reduces pain and modulates spinal astrocytic reactivity after cervical nerve root compression. *Annals of Biomedical Engineering*, 38(8):2563-2576, 2010.
- *50. **Winkelstein BA**, Kras JV. Is there an antinociceptive role for peripheral brain-derived neurotrophic factor? *The Spine Journal*, 10(8):733-735, 2010.
51. Quinn KP, **Winkelstein BA**. Full field strain measurements of collagenous tissue by tracking fiber alignment through vector correlation. *Journal of Biomechanics*, 43(13): 2637-2640, 2010.
52. Nicoll SB, Hee CK, Davis MB, **Winkelstein BA**. A rat model of TMJ pain with histopathologic modifications. *Journal of Orofacial Pain*, 24(3):298-304, 2010.
53. Quinn KP, Dong L, Golder FJ, **Winkelstein BA**. Neuronal hyperexcitability in the dorsal horn after painful facet joint injury. *Pain*, 151(2):414-421, 2010.
54. Weisshaar CL, Dong L, Bowman AS, Perez FM, Guarino BB, Sweitzer SM, **Winkelstein BA**. Metabotropic glutamate receptor-5 and protein kinase C-epsilon increase in dorsal root ganglion neurons and spinal glial activation in an adolescent rat model of painful neck injury. *Journal of Neurotrauma*, 27(12):2261-2271, 2010.
55. Rothman SM, Ma LH, Whiteside GT, **Winkelstein BA**. Inflammatory cytokine and chemokine expression is differentially modulated acutely in the dorsal root ganglion in response to different nerve root compressions. *Spine*, 36(3):197-202, 2011.
56. Dunk NM, Nicholson KJ, **Winkelstein BA**. Impaired performance on the angle board test is induced in a model of painful whiplash injury but is only transient in a model of cervical radiculopathy. *Journal of Orthopaedic Research*, 29(4):562-566, 2011.
57. Thorek DLJ, Weisshaar CL, Czupryna JC, **Winkelstein BA**, Tsourkas A. Superparamagnetic iron oxide-enhanced magnetic resonance imaging of neuroinflammation in a rat model of radicular pain. *Molecular Imaging*, 10(3):206-214, 2011.
58. Jaumard NV, Bauman JA, Welch WC, **Winkelstein BA**. Pressure measurement in the cervical spinal facet joint: considerations for maintaining joint anatomy and an intact capsule. *Spine*, 36(15):1197-1203, 2011.
59. Quinn KP, **Winkelstein BA**. Detection of altered collagen fiber alignment in the cervical facet capsule after whiplash-like joint retraction. *Annals of Biomedical Engineering*, 39(8):2163-2173, 2011.
60. Quinn KP, **Winkelstein BA**. Preconditioning is correlated with altered collagen fiber alignment in ligament. *Journal of Biomechanical Engineering*, 133(6):064506, 2011.
61. Jaumard NV, Bauman JA, Weisshaar CL, Guarino BB, Welch WC, **Winkelstein BA**. Contact pressure in the facet joint during sagittal bending of the cadaveric cervical spine. *Journal of Biomechanical Engineering*, 133(7):071004, 2011.
- *62. Jaumard NV, Welch WC, **Winkelstein BA**. Spinal facet joint biomechanics and mechanotransduction in normal, injury and degenerative conditions. *Journal of Biomechanical Engineering*, 133(7):074501, 2011.
63. Dong L, Guarino BB, Jordan-Sciutto KL, **Winkelstein BA**. Activating transcription factor 4, a mediator of the integrated stress response, is increased in the dorsal root ganglia following painful facet joint distraction. *Neuroscience*, 193:377-386, 2011.

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16. **Winkelstein BA**, Finsness ED, Ridgway AB, DeLeo JA. Anatomic and Biomechanical Considerations for Painful Lumbar Radiculopathy Models. *Society for Neuroscience 32nd Annual Meeting*, #758.7, Orlando, FL, November, 2002.
17. **Winkelstein BA**, DeLeo JA. The Role of Tissue Biomechanics in Painful Injuries: Mechanics, Cellular Responses and Pain Behaviors. *ASME Summer Bioengineering Conference*, pg. 151-152, Key Biscayne, FL, June, 2003.
18. Lee KE, Thinnis JH, Gokhin D, **Winkelstein BA**. Preliminary Findings in a Novel Facet-Mediated Neck Pain Model: Biomechanical Implications for Whiplash Injuries. *International Whiplash Trauma Congress*, Abstract #2, Denver, CO, October, 2003.
19. Hubbard RD, Lee KE, **Winkelstein BA**. Effects of Nerve Root Compression Magnitude on Behavioral Outcomes: Preliminary Findings in a Neck Pain Model. *National Neurotrauma Society Meeting*, #340. Biloxi, MS, November, 2003.
- *20. **Winkelstein BA**, Hubbard RD, DeLeo JA. Biomechanics and Painful Injuries: Tissue & CNS Responses for Nerve Root Mechanical Injuries. *ASME International Mechanical Engineering Conference*, #IMECE2003-43117, Washington DC, November, 2003.
21. Davis M, Simon S, Odner D, Iwanaga T, Udupa JK, **Winkelstein BA**. Biomechanical Characterization of Cervicothoracic Junction Biomechanics Using CT Imaging. *BMES 2004 Annual Fall Meeting*, #1138, Philadelphia, PA, October, 2004.
22. Franklin AN, Lee KE, **Winkelstein BA**. Tensile Mechanical Characterization of the Rat Facet Capsule. *BMES 2004 Annual Fall Meeting*, Philadelphia, PA, October, 2004.

* Invited.

* Invited.

23. Hubbard R, Rothman S, **Winkelstein B**. Mechanisms of Persistent Neck Pain Following Nerve Root Compression Injury: Understanding Behavioral Hypersensitivity in the Context of Spinal Cytokine Responses and Tissue Biomechanics. *North American Spine Society 19th Annual Meeting*, #P49, Chicago, IL, October, 2004.
24. Rothman SM, Kreider RA, **Winkelstein BA**. Understanding Mechanisms of Painful Cervical Nerve Root Injury: Defining a Relationship Between Persistent and Resolving Neck Pain Symptoms and Spinal Neuropeptide Responses. *Cervical Spine Research Society 32nd Annual Meeting*, Paper #38, Boston, MA, December, 2004.
25. Rothman SM, Kreider RA, **Winkelstein BA**. Cervical Nerve Root Axotomy & Radiculopathy Produce Different Pain Symptoms & Spinal Neuropeptide Patterns Suggesting Separate Mechanisms of Acute & Chronic Pain. *Orthopaedic Research Society 51st Annual Meeting*, Poster/Short Talk #371, Washington DC, February, 2005.
- *26. Lee KE, Franklin AN, **Winkelstein BA**. Subfailure Injuries of the Neck: Implications for Whiplash and Pain. *International Whiplash Trauma Congress*, Breckenridge, CO, February, 2005.
27. Quinn KP, **Winkelstein BA**. Defining Quasilinear Viscoelastic Parameters for the Rat Cervical Facet Capsular Ligament in Tension. *BMES 2005 Annual Fall Meeting*, #142032, Baltimore, MD, September, 2005.
28. Campbell AG, Slipman C, Mencken S, **Winkelstein B**, Fras C, Chin K. Tumor Necrosis Factor-Alpha Levels in Herniated Intervertebral Discs. *Annual Assembly of American Academy of Physical Medicine & Rehabilitation*, #84, Philadelphia, PA, September, 2005.
29. Hubbard R, **Winkelstein B**. Timing of Rhizotomy After Painful Dorsal Root Compression Affects Behavioral Hypersensitivity and Spinal Responses. *National Neurotrauma Society 23rd Annual Meeting*, #P203, Washington, DC, November, 2005.
30. Lee K, Tan A, Quinn K, Commons K, **Winkelstein B**. Spinal Expression of Substance P and its Receptor in Cervical Facet Joint-Mediated Injury: Preliminary Findings in a Model of Persistent Neck Pain. *National Neurotrauma Society 23rd Annual Meeting*, #P23, Washington, DC, November, 2005.
- §31. Rothman S, **Winkelstein B**. Cervical Nerve Root Injury Differentially Upregulates Spinal TNF at Early Time Points for Persistent and Resolving Pain in a Rat Model. *National Neurotrauma Society 23rd Annual Meeting*, #P292, Washington, DC, November, 2005.
32. Santos DG, **Winkelstein BA**. Persistent Pain from Facet Joint Tension Requires Mechanical Loading of the Facet Capsule. *Orthopaedic Research Society 52nd Annual Meeting*, #1294, Chicago, IL, March 2006.
- *33. **Winkelstein B**, Quinn K, Lee K. Mechanical & Physiological Pathologic Mechanisms of Painful Cervical Facet Capsule Injury. *International Whiplash Trauma Congress*, Portland, OR, June, 2006.
34. **Winkelstein B**, Rothman S, Hubbard R. Cervical Nerve Root Compression Produces Persistent Allodynia That May be Mediated by Both Afferent Communication with the CNS & Spinal TNF. *Keystone Symposium: Pain Mechanisms & the Development of Analgesics*, #219, Keystone, CO, June, 2006.

* Invited.

§ Graduate student received Student Travel Grant award from National Neurotrauma Society to present paper, 2005.

* Invited.

- #35. Hubbard RD, **Winkelstein BA**. Cervical Nerve Root Compression Elicits Behavioral Hypersensitivity Dependent on the Magnitude of Applied Load. *ASME Summer Bioengineering Conference*, #152557, Amelia Island, FL, June 2006.
- *36. Lee KE, Gupta M, **Winkelstein BA**. In Vivo Facet Capsule Failure in a Rat Model: Implications for Whiplash & Facet-Mediated Neck Pain. *5th World Congress of Biomechanics*, #4489, Munich, Germany, July, 2006.
- *37. Maltese MR, Arbogast KB, Nadkarni V, **Winkelstein BA**, Micklebust H, Nysaether J. Novel Methods to Determine Pediatric Anterior-Posterior Thoracic Force-Deflection Characteristics. *5th World Congress of Biomechanics*, #6984, Munich, Germany, July, 2006.
- ¥38. Lee KE, **Winkelstein BA**. Collagen Fiber Organization in the Cervical Facet Capsular Ligament Following Painful Facet Joint Distraction in the Rat. *ASME Summer Bioengineering Conference*, #176125, Keystone, CO, June 2007.
39. Nicoll SB, Hee CK, Davis MB, **Winkelstein BA**. A Rat Model of Osteoarthritic Temporomandibular Joint Pain: Mechanically-Induced Behavioral Hypersensitivity and Histologic Modifications. *ASME Summer Bioengineering Conference*, #76, Keystone, CO, June 2007.
- §40. Dong L, Lee KE, **Winkelstein BA**. Dynamic Distraction of the Facet Joint Produces Higher Mechanical Allodynia than Quasistatic Distraction: Implications of Displacement Thresholds for Pain in Whiplash Loading. *ASME Summer Bioengineering Conference*, #176587, Keystone, CO, June 2007.
41. Hubbard RD, Burdick, JA, **Winkelstein BA**. Hydrogel Delivery of GDNF Reduces Behavioral Hypersensitivity Following Painful Nerve Root Compression. *BMES Annual Fall Meeting*, #181688, Los Angeles, CA, September 2007.
42. Lee KE, Quinn KP, **Winkelstein BA**. Biomechanical Outcomes of the Cervical Facet Joint for Painful Subfailure Loading. *Philadelphia Spine Research Symposium*, Philadelphia, PA, October 2007.
43. Hubbard RD, Burdick JA, **Winkelstein BA**. Biomechanics of Dorsal Root Injury Drives Pain Symptoms & Neuronal Pathology Which Can be Rescued by Hydrogel Delivery of GDNF: A Potential Therapeutic for Chronic Radicular Pain. *Philadelphia Spine Research Symposium*, Philadelphia, PA, October 2007.
44. Radin S, Huang Z, Garino J, **Winkelstein BA**, Ducheyne P. Controlled Release of Analgesics for Post-Operative Pain Management Using Sol Gel Delivery Formulations. *8th World Biomaterials Congress*, #1297, Amsterdam, The Netherlands, May 2008.
- ‡45. Dong L, Odeleye A, Akay C, Jordan-Sciutto K, **Winkelstein BA**. The Stress Response in Injured Afferents of the Capsular Ligament Depends on Tensile Loading Applied to the Facet Joint. *ASME Summer Bioengineering Conference*, #192666, Marco Island, FL, June 2008.
- ‡46. Quinn KP, Lee KE, **Winkelstein BA**. Joint Distractions Sufficient to Produce Pain Increase Collagen Fiber Undulation in the Cervical Facet Capsular Ligament in the Rat. *ASME Summer Bioengineering Conference*, #192644, Marco Island, FL, June 2008.

Graduate student received 1st place in PhD Student Paper Competition at ASME-BED Summer Meeting, 2006.

* Invited.

* Invited.

¥ Graduate student received Student Travel Grant award from GSAC (Penn) to present paper, 2007.

§ Graduate student received Honorable Mention in PhD Student Paper Competition at ASME-BED Meeting, 2007.

‡ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2008.

‡ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2008.

47. Choo AM, Winer JP, **Winkelstein BA**, Smith DH, Janmey PA, Meaney DF. Salmon-Derived Fibrin for the Acute Treatment of Cortical Ablation Brain Injuries. *National Neurotrauma Society 26th Annual Meeting*, #P63, Orlando, FL, July 2008.
48. Thorek D, Rothman S, **Winkelstein B**, Tsourkas A. Magnetic Resonance Imaging of Small Animal Pain Model Using SPIO. *BMES Annual Fall Meeting*, #P4.110, Saint Louis, MO, October 2008.
49. Dong L, Odeleye A, Akay C, Jordan-Sciutto K, **Winkelstein BA**. Painful Cervical Facet Joint Injury Activates the Neuronal Stress Response in the DRG. *Society for Neuroscience Annual Meeting*, #415.12, Washington DC, November 2008.
- ‡50. Rothman SM, **Winkelstein BA**. Spinal Glial Proliferation in Painful Cervical Nerve Root Compression. *Society for Neuroscience Annual Meeting*, #213.11, Washington DC, November 2008.
51. Choo AM, Winer JP, **Winkelstein BA**, Smith DH, Janmey PJ, Meaney DF. Salmon-Derived Fibrin for the Acute Treatment of Cortical Ablation Brain Injuries. *Society for Neuroscience Annual Meeting*, #753.4, Washington DC, November 2008.
52. Weisshaar C, Winer J, Rothman S, Janmey P, **Winkelstein B**. Salmon-Derived Fibrin Attenuates Allodynia Following Transient Cervical Nerve Root Injury in the Rat. *Keystone Symposium: Neurobiology of Pain and Analgesia*, #219, Santa Fe, NM, February 2009.
53. Quinn KP, Luck JF, Nightingale RW, **Winkelstein BA**. The Onset of Structural Yield During Tensile Loading Increases With Age In The Pediatric PMHS Cervical Spine. *ASME Summer Bioengineering Conference*, #204771, Lake Tahoe, CA, June 2009.
- *54. Craig KM, Quinn KP, **Winkelstein BA**. Force At Damage And Failure Decreases With Age In The Human Cadaveric Facet Capsular Ligament During Tension.” *ASME Summer Bioengineering Conference*, #206135, Lake Tahoe, CA, June 2009.
55. Bauman JA, Weisshaar CL, Davis MB, Craig KM, Schuster JM, **Winkelstein BA**. An Integrated Experimental System to Measure Cervical Facet Joint Pressure in the Cadaver: A Pilot Study. *Global Spine Conference*, #194, San Francisco, CA, June 2009.
56. Bauman, JA, Jaumard NV, Weisshaar CL, Schuster JM, **Winkelstein BA**, Welch WC. An Integrated System to Measure Pressures in the Cervical Facet Joint in Human Cadavers. *Pennsylvania Neuosurgical Society Annual Conference*, Hershey, PA, July 2009.
57. Thorek DLJ, Weisshaar CL, **Winkelstein BA**, Tsourkas A. MR Detection of Macrophage Using SIPO after Transient Cervical Nerve Root Compression in the Rat. *World Molecular Imaging Congress*, #0058, Montreal, Canada, September 2009.
58. Quinn KP, Craig KM, **Winkelstein BA**. Detecting Facet Capsular Ligament Injury During Tension Using Collagen Fiber Realignment. *Annual Meeting of Association for the Advancement of Automotive Medicine*, #P02, Baltimore, MD, October 2009.
59. Thorek DLJ, Weisshaar CL, **Winkelstein BA**, Tsourkas A. SPIO-Enabled Detection of Transient Cervical Nerve Root Compression in a Rat Model. *BMES Annual Fall Meeting*, #OP1-3-12A, Pittsburgh, PA, October 2009.
- ‡*60. Lee KE, Kras JV, Robinson ES, Weisshaar CL, **Winkelstein BA**. Mechanical Facet Joint Injury Alters Early but not Long-Term Neuronal Activity in the Spinal Cord. *BMES Annual Fall Meeting*, #OP8-2-7C, Pittsburgh, PA, October 2009.

‡ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2008.

* Bachelor student received 3rd Place in Poster Competition, Student Paper Competition, ASME-BED Mtg, 2009.

‡ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2009.

* Graduate student received Travel Grant award from Biomedical Engineering Society to present paper, 2009.

61. **Winkelstein BA**, Udupa JK, Hilibrand AS, Schuster JM, Siegler S, Hirsch BE, Borthakur A, Melhem ER. Novel Imaging Approach Using 3D Stress MRI to Detect Altered Biomechanics in Neck Pain Patients. *BMES Annual Fall Meeting*, #OP10-3-8D, Pittsburgh, PA, October 2009.
- ‡62. Dong L, Martinez JJ, **Winkelstein BA**. Spinal DREAM, a Transcriptional Repressor, is Downregulated After Painful Facet Joint Injury. *BMES Annual Fall Meeting*, #PS8B-135, Pittsburgh, PA, October 2009.
- ‡*63. Nicholson KJ, Rothman, SM, **Winkelstein BA**. Mechanical & Physiologic Outcomes After Nerve Root Compression Depend on the Applied Duration. *BMES Annual Fall Meeting*, #OP8-1-11F, Pittsburgh, PA, October 2009.
64. Hirsch BE, Udupa JK, Siegler S, **Winkelstein BA**. The Application of 3D Image Processing to Studies of the Musculoskeletal System. *6th International Symposium on Multispectral Image Processing & Pattern Recognition*, Yichang, China, October 2009.
65. Thorek DLJ, Weisshaar CL, **Winkelstein BA**, Tsourkas A. SPIO-Enhanced Detection of Transient Cervical Nerve Root Compression. *Radiologic Society of North America Annual Meeting*, #SSA12-08, Chicago, IL, November 2009.
66. **Winkelstein BA**, Udupa JK, Hilibrand AS, Schuster JM, Siegler S, Hirsch BE, Borthakur A, Melhem ER. A Novel 3D Stress MR Imaging Approach to Detect Altered Biomechanics in Neck Pain Patients. *Cervical Spine Research Society Annual Meeting*, Paper #17, Salt Lake, UT, December 2009.
67. Bauman, JA, **Winkelstein BA**, Udupa JK, Hilibrand AS, Schuster JM, Siegler S, Hirsch BE, Borthakur A, Melhem ER. Defining Volumetric and Orientation Tropisms in Cervical Facet Joints Using High-Resolution Kinematic MRI. *Cervical Spine Research Society Annual Meeting*, Poster #46, Salt Lake, UT, December 2009.
68. **Winkelstein BA**. Inflammatory Mechanisms Contributing to Cervical Radiculopathy. *18th Annual Meeting of the Rachidian Society*, Kona, HI, February, 2010.
69. Bowman C, Perez F, Dong L, Weisshaar C, **Winkelstein BA**, Sweitzer SM. Facet Joint Injury in the Neck Increases Expression of Metabotropic Glutamate Receptor-5 and Protein Kinase-C Epsilon in Afferent Neurons in a Rat Model of Whiplash Injury. *SYNAPSE Conference*, Winston-Salem, NC, March 2010.
70. **Winkelstein BA**, Rothman SM. Cytokine Antagonism Early After Cervical Nerve Root Compression Reduces Pain and Modulates Spinal Astrocytic Reactivity. *American Pain Society Annual Meeting*, #218, Baltimore, MD, May 2010.
- ‡71. Crosby ND, Quinn KP, **Winkelstein BA**. Microstructural Modeling of Fiber Kinematics and Biomechanics of the Human Facet Capsular Ligament During Subfailure Loading. *ASME Summer Bioengineering Conference*, #SBC2010-19236, Naples, FL, June 2010.
72. Sander EA, Quinn KP, **Winkelstein BA**, Barocas VH. Localizing Damage in the Cervical Facet Capsular Ligament with Image-Based Multiscale Models. *ASME Summer Bioengineering Conference*, #SBC2010-192971, Naples, FL, June 2010.
73. Jaumard NJ, Bauman JA, Welch WC, **Winkelstein BA**. Biomechanical Comparison of Contact Pressure in the Cervical Facet Joint During Bending Using a Probe & Pressure-

‡ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2009.

‡ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2009.

* Graduate student received Travel Grant award from Biomedical Engineering Society to present paper, 2009.

‡ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2010.

- Sensitive Paper. *ASME Summer Bioengineering Conference*, #SBC2010-19498, Naples, FL, June 2010.
74. Quinn KP, Dong L, Kras JV, Golder FJ, **Winkelstein BA**. Painful Cervical Facet Joint Distraction Produces Neuronal Plasticity in the Spinal Dorsal Horn. *6th World Congress of Biomechanics*, #D2-C-S2.3-02, Singapore, August 2010.
 75. Jaumard NJ, Bauman JA, Welch WC, **Winkelstein BA**. Contact Pressure in the Cervical Facet Joint During Sagittal Bending: Quantification of Pressure Magnitudes & Locations. *6th World Congress of Biomechanics*, #D4-C-T2.6-03, Singapore, August 2010.
 76. Golder FJ, Quinn KP, Dong L, Kras JV, **Winkelstein BA**. Hyperexcitability of Dorsal Horn Neurons in a Model of Joint Pain. *Society for Neuroscience Annual Meeting*, #158.1/R2, San Diego, CA, November 2010.
 77. Weisshaar CL, Dong L, Bowman C, Perez FM, Guarino BB, Sweitzer SM, **Winkelstein BA**. Neuronal & Inflammatory Responses in an Adolescent Rat Model of Painful Joint Injury in the Neck. *Society for Neuroscience Annual Meeting*, #176.13/NN11, San Diego, CA, November 2010.
 - †78. Dong L, **Winkelstein BA**. Injection of Ketorolac Attenuates Joint-Mediated Neck Pain Through the EP2 Prostaglandin Receptor. *Society for Neuroscience Annual Meeting*, #78.3/RR17, San Diego, CA, November 2010.
 79. Weisshaar CL, Winer J, Sawyer E, Janmey P, **Winkelstein BA**. Salmon Fibrin as a Novel Biomaterial for Treating Pain. *Cervical Spine Research Society Annual Meeting*, Poster #23, Charlotte, NC, December 2010.
 - *80. **Winkelstein BA**, Weisshaar CL, Thorek DL, Hubbard RD, Tsourkas A. Macrophage as a Potential Biomarker for Imaging Radicular Pain. *Cervical Spine Research Society Annual Meeting*, Paper #15, Charlotte, NC, December 2010.
 - †81. Nicholson KJ, Dunk NM, Guarino BB, Reuther KE, **Winkelstein BA**. Functional Assessment & Widespread Spinal Glial Activation in Two Cervical Injury Models of Persistent Pain. *Orthopaedic Research Society Annual Meeting*, #0638, Long Beach, CA, January 2011.
 82. Bauman JA, Jaumard NV, Weisshaar CL, Guarino BB, Welch WC, **Winkelstein BA**. Contact Pressure in the Cervical Facet Joint During Physiologic Sagittal Bending of the Spine. *American Association of Neurological Surgeons – Congress of Neurological Surgeons Joint Section Meeting on Disorders of the Spine and Peripheral Nerves*, #358, April 2011.
 - †83. Smith JR, Rothman SM, Janmey PA, **Winkelstein BA**. Spinal PAR1 mRNA Levels are Regulated by Mechanical & Chemical Cues in Painful Nerve Root Compression. *ASME Summer Bioengineering Conference*, #SBC2011-53084, Namacolin, PA, June 2011.
 84. Nicholson KJ, **Winkelstein BA**. The Duration of a Nerve Root Compression Modulates Evoked Neuronal Responses in a Rat Model of Radicular Pain. *ASME Summer Bioengineering Conference*, #SBC2011-53082, Namacolin, PA, June 2011.
 - *85. Svensson MY, Siegmund GP, **Winkelstein BA**, Vasavada A, Jakobsson L, Ivancic PC. Reducing the Risk of Neck Injury Sequelae; Injury Mechanisms and Prevention. *5th International Whiplash Symposium*, Lund, Sweden, August 2011.

† Graduate student received Student Travel Grant award from GAPSA (Penn) to present paper, 2010.

* Paper received 1st Place, Best Basic Science Research Award at CSRS Meeting, 2010.

† Graduate student received Student Travel Grant award from GAPSA (Penn) to present paper, 2011.

† Graduate student received Student Travel Grant award from GAPSA (Penn) to present paper, 2011.

* Invited.

86. Quinn KP, **Winkelstein BA**. Whiplash-Like Cervical Facet Joint Retraction Produces Altered Collagen Fiber Alignment in the Capsular Ligament. *Annual Meeting of Association for the Advancement of Automotive Medicine*, #P21, Paris, France, October 2011.
87. Smith J, Rothman S, Black J, **Winkelstein BA**. Spinal PAR1 mRNA Expression Decreases Early After Painful Nerve Root Injury with Inflammation. *BMES Annual Meeting*, #Sat-1-5-A, Hartford, CT, October 2011.
- †88. Crosby N, **Winkelstein BA**. Spinal Neuronal Hyperexcitability is Induced Within 1 Day of a Painful Facet Joint Injury. *BMES Annual Meeting*, #Thurs-1-5-D, Hartford, CT, October 2011.
89. Oake SA, Smith JR, Janmey PA, **Winkelstein BA**. Distinct Effects of Human and Salmon Thrombin on the Inflammatory Response of Mammalian Astrocytes. *BMES Annual Meeting*, #Sat-1-2-C, Hartford, CT, October 2011.
90. Black JB, Weisshaar CL, Elliott JM, **Winkelstein BA**. Spinal Metabotropic Glutamate Receptor-3 Increases Immediately Following Painful Facet Joint Injury. *BMES Annual Meeting*, #Sat-3-10-B, Hartford, CT, October 2011.
91. Weisshaar CL, Black JB, Elliott JM, **Winkelstein BA**. The Spinal Metabotropic Glutamate Receptor-3 is Modified Early Following Painful Facet Joint Injury. *New Horizons in Intervertebral Disc Research Meeting*, #P.11, Philadelphia, PA, November 2011.
92. Bauman JA, Jaumard NV, Guarino BB, Weisshaar CL, Lipschutz DE, Welch WC, **Winkelstein BA**. Facet Contact Pressure in Sagittal Bending is Not Altered by ProDisc-C Disc Arthroplasty: A Single Level Cadaveric Study. *American Association of Neurological Surgeons – Congress of Neurological Surgeons Joint Section Meeting on Disorders of the Spine and Peripheral Nerves*, Poster #308, Miami, FL, April 2012.
93. Branconi JL, Guarino BB, Baig HA, **Winkelstein BA**. Painful Whole Body Vibration Increases NGF & BDNF in Cervical Intervertebral Discs in the Rat. *Northeast Bioengineering Conference*, Philadelphia, PA, March 2012.
94. Freedman BR, Baig HA, Guarino BB, **Winkelstein BA**. Biomechanical Effects of Whole Body Vibration on Spinal Ligaments: A Potential Mechanism of Tissue Damage. *Northeast Bioengineering Conference*, Philadelphia, PA, March 2012.
95. Guarino BB, Baig HA, Branconi JL, **Winkelstein BA**. Repeated Whole Body Vibration Exposure Induces Prolonged Mechanical Hyperalgesia & Increased Spinal COX-2: A Novel Rat Model. *Northeast Bioengineering Conference*, Philadelphia, PA, March 2012.
96. Baig HA, Guarino BB, Jaumard NV, **Winkelstein BA**. The Transmissibility Response of the Rat During Whole Body Vibration Along its Long-Axis. *Northeast Bioengineering Conference*, Philadelphia, PA, March 2012.
97. Gokhale AJ, Guarino BB, **Winkelstein BA**. The Rat as a Viable Model for Human Cervical Biomechanics: A Quantitative Anatomy Study. *Northeast Bioengineering Conference*, Philadelphia, PA, March 2012.
98. Weisshaar CL, Kras JV, Tanaka K, **Winkelstein BA**. Pain Subsequent to Mechanical Loading of the Facet Capsular Ligament Depends on Encoding by Afferents in the Spinal Facet Joint. *ASME Summer Bioengineering Conference*, #SBC2012-80456, Fajardo, Puerto Rico, June 2012.
99. Crosby ND, Dong L, **Winkelstein BA**. Transient Tensile Facet Capsular Ligament Loading Above the Mechanical Threshold to Induce Pain also Regulates Spinal Neuronal

† Graduate student received Student Travel Grant award from GAPSA (Penn) to present paper, 2011.

- Hyperexcitability. *ASME Summer Bioengineering Conference*, #SBC2012-80592, Fajardo, Puerto Rico, June 2012.
100. Claeson AA, Yeh Y-J, Akkin T, **Winkelstein BA**, Nuckley J, Barocas VH. OCT Detects Altered Collagen Fiber Alignment in Human Cadaveric Lumbar Facet Capsular Ligament During Mechanical Loading. *ASME Summer Bioengineering Conference*, #SBC2012-80296, Fajardo, Puerto Rico, June 2012.
101. **Winkelstein BA**, Weisshaar C. Spinal NK1-Receptor Expressing Cells Contribute to the Development of Pain from the Facet Joint. *14th World Congress on Pain*, #PW254, Milan, Italy, August 2012.
102. Smith JR, Weisshaar CL, Janmey PJ, **Winkelstein BA**. Salmon Thrombin Treatment Reduces Protease Activated Receptor 1 Expression Following Painful Nerve Root Injury. *Military Health System Research Symposium*, #12-141, Ft. Lauderdale, FL, August 2012.
103. Guarino BB, Baig HA, Jaumard NV, Branconi JL, Dorman DB, Shivers BL, **Winkelstein BA**. A New Model of Repeated Whole Body Vibration Exposure in the Rat: Biomechanical & Pain Responses. *Military Health System Research Symposium*, #12-023, Ft. Lauderdale, FL, August 2012.
104. Elliott JM, Weisshaar CL, Black JB, **Winkelstein BA**. Neuromuscular Mechanisms Underlying the Transition to Chronic Pain following Traumatic Spinal Injury – From Animal to Human Models. *International Federation of Orthopaedic Manipulative Physical Therapists 2012 Meeting*, Quebec City, Canada, October 2012.
105. Barr GA, **Winkelstein BA**. Maturational Changes in Chronic Pain Following Nerve Injury in the Rat. *Society for Neuroscience*, #376.08/QQ12, New Orleans, LA, October 2012.
- *106. Gilliland T, Nicholson K, Chang Y-W, **Winkelstein BA**. Mechanical Trauma to Neural Tissue Decreases Spinal GLT1 Expression. *BMES Annual Meeting*, #OP-Fri-3-10, Atlanta, GA, October 2012.
107. Gulloti D, Chen Y, Patel T, Merdiushev T, Jaumard N, **Winkelstein B**, Morrison B, Bass D, Panzer M, Meaney D. A Model of Blast Induced Traumatic Brain Injury in Mice. *BMES Annual Meeting*, #P-Fri-B-160, Atlanta, GA, October 2012.
- ‡108. Syré P, Smith JR, Nicholson KJ, Welch WC, Janmey PA, **Winkelstein BA**. Salmon Thrombin Leads to Decreased Spinal Cord Responsiveness in Painful Radiculopathy. *24th Annual Pan Philadelphia Neurosurgery Conference*, Philadelphia, PA, December 2012.
109. Smith JR, Nicholson KJ, Syré P, Janmey PA, **Winkelstein BA**. A Novel Bioengineered Biomaterial to Treat Painful Neural Trauma via Modified Thrombin Activity for Improving Neuronal Function and Treating Pain. *Cervical Spine Research Society Annual Meeting*, Chicago, IL, December 2012.
110. Gilliland T, Nicholson K, Chang Y-W, **Winkelstein BA**. Spinal GLT1 Modulation After Painful Nerve Root Injury Requires a Mechanical Contribution. *Orthopaedic Research Society Annual Meeting*, #0798, San Antonio, TX, January 2013.
111. Tanaka K, Baig HA, Guarino BB, Smith JR, **Winkelstein BA**, Jordan-Scuitto KL. Painful Whole Body Vibration is Associated with Decreased BiP Expression in the Lumbar Spinal Cord. *American Association of Endodontics Annual Session*, #OR12, Honolulu, HI, March 2013.
- ^*112. Baig HA, Dorman DB, Shivers BL, Breaux-Waltz A, Chancey VC, **Winkelstein BA**. Characterization of the Frequency & Muscle Response in the Lumbar & Thoracic Spines

* Graduate student received Student Travel Grant award from GAPSA (Penn) to present paper, 2012.

‡ Resident Awarded Best Resident Paper at Conference, 2012.

- during Sinusoidal Vertical Whole Body Vibration. *ASME Summer Bioengineering Conference*, #SBC2013-14055, Sunriver, OR, June 2013.
- *113. Nicholson KJ, Gilliland TM, **Winkelstein BA**. Duration of Nerve Root Compressive Trauma Modulates the Subsequent Thermal Hyperalgesia & the Spinal Expression of the Glutamate Transporter, GLT1. *ASME Summer Bioengineering Conference*, #SBC2013-14110, Sunriver, OR, June 2013.
114. Jaumard NV, Baig HA, Guarino BB, **Winkelstein BA**. A Three Degree of Freedom Lumped Parameter Model of Whole Body Vibration Along the Spine in the Rat. *ASME Summer Bioengineering Conference*, #SBC2013-14111, Sunriver, OR, June 2013.
115. Kras, JV, **Winkelstein BA**. Intra-Articular Nerve Growth Factor is Both Necessary and Sufficient for the Development of Joint Pain and Contributes to Central Sensitization. *BMES Annual Meeting*, #OP-Thurs-1-12, Seattle, WA, September 2013.
116. Syré PP, Lee JYK, **Winkelstein BA**. Increased Electrophysiological Activity in Neurons in the Thalamus and Spinal Cord is Evident in Persistent Pain States after Cervical Radiculopathy. *Congress of Neurological Surgeons 2013 Annual Meeting*, #374, San Francisco, CA, October 2013.
- ♦117. Kras JV, Weisshaar CL, Quindlen JC, **Winkelstein BA**. A Role for Spinal Brain-Derived Neurotrophic Factor in Persistent Pain in a Rat Model of Mechanical Facet Joint Injury. *Society for Neuroscience*, #267.04/UU19, San Diego, CA, November 2013.
- ♦118. Crosby ND, Dong L, **Winkelstein BA**. Dorsal Horn Synaptogenesis after Painful Joint Injury is Attenuated by Gabapentin. *Society for Neuroscience*, #827.05/UU20, San Diego, CA, November 2013.
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^ Masters student received 3rd Place in Student Paper Competition, ASME-SBC Mtg, 2013.

* Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2013.

^ Graduate student finalist in PhD Student Paper Competition at ASME-BED Meeting, 2013.

♦ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2013.

♦ Graduate student received Student Travel Grant award from GAPSAs (Penn) to present paper, 2013.

^ Paper received 1st Place, Best Basic Science Research Award at CSRS Meeting, 2013.

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* Paper received 2nd Place in BS Student Paper Competition, World Congress of Biomechanics Mtg, 2014.

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♦ Graduate student finalist in PhD Student Paper Competition, 2015.

▲ Paper received 2nd Place in PhD Student Paper Competition, 2015.

* Paper received 1st Place in PhD Student Paper Competition, 2015.

* Graduate student finalist in PhD Student Paper Competition, 2016.

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§ Paper received 1st place in MS Student Paper Competition, 2016.

♦ Graduate student received GAPSAs Research Travel Grant (Penn) to present paper, 2016.

† Graduate student finalist in PhD Student Paper Competition, 2016.

♦ Graduate student received GAPSAs Research Travel Grant (Penn) to present paper, 2016.

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