

PERSONAL

Name

Ellen M. Arruda

Degrees

Ph.D. in Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA, 1992.

M.S. in Engineering Mechanics, Pennsylvania State University, State College, PA, 1988.

B.S. with Honors in Engineering Science, Pennsylvania State University, State College, PA, 1985.

Positions at U of M

Visiting Assistant Professor, Department of Mechanical Engineering and Applied Mechanics, August, 1992 to September, 1992.

Assistant Professor, Department of Mechanical Engineering and Applied Mechanics, September, 1992 to August, 1999.

Assistant Professor, Macromolecular Science and Engineering, September, 1992 to August, 1999.

Associate Professor, Department of Mechanical Engineering, September, 1999 to August, 2005.

Associate Professor, Macromolecular Science and Engineering, September, 1999 to August, 2005.

Professor, Department of Mechanical Engineering, September, 2005 to present.

Professor, Macromolecular Science and Engineering, September, 2005 to present.

Faculty Member, University of Michigan Bone & Joint Injury Prevention & Rehabilitation Center, April, 2009 to April, 2010.

Professor, Department of Biomedical Engineering, September, 2009 to present.

Professor, Center for Organogenesis, September, 2010 to present.

Brief Biography

Professor Ellen M Arruda is a Professor of Mechanical Engineering at the University of Michigan. She also holds appointments in Biomedical Engineering and in Macromolecular Science and Engineering. Professor Arruda earned her B.S. degree in Engineering Science and her M.S. degree in Engineering Mechanics from The Pennsylvania State University, and her Ph.D. degree in Mechanical Engineering from the Massachusetts Institute of Technology. She joined the UM faculty in 1992.

Professor Arruda teaches and conducts research in the areas of theoretical and experimental mechanics of macromolecular materials, including polymers, elastomers, composites, soft tissues and proteins, and in tissue engineering of soft tissues and tissue interfaces. Her research programs include experimental characterization and analytical and computational modeling of

soft materials, including native and engineered tissues. Her interests in tissue engineering include scaffoldless methods using primary and mesenchymal cell sources, tissue engineering of tissue interfaces such as the myotendinous junction, and enthesis and multi-phasic tissue engineering. Her polymer mechanics work has focused on the mechanics of these highly strain rate and temperature dependent materials with emphasis on the relationships among the structure at various length scales to the deformation mechanisms of those structures to predict the mechanical responses. Professor Arruda's current research objectives in tissue engineering and tissue mechanics are the design and development of scaffold-free multi-component tissue structures with functional interfaces for use as grafts in soft tissue tears such as the anterior cruciate ligament (ACL) and the supraspinatus (rotator cuff) tendon. This research necessitates an extensive experimental program to characterize the non-linear, anisotropic, viscoelastic response of native and engineered soft tissues. Professor Arruda has developed a highly successful model for ACL repair that restores native anatomy and function within 6-9 months of implantation and has formed a start-up company to market this technology. Her work has recently earned several honors and awards including the Ann Arbor Spark Best of Boot Camp award 2012, the 2012 Excellence in Research Award by the American Orthopaedic Society for Sports Medicine, and the cover article in *Tissue Engineering*, January, 2012. She currently holds three patents for this work.

Professor Arruda's goals in her current polymer mechanics research are the design and development of high-performance polymer nanocomposites with exceptional properties under very high strain rates of loading. Her work involves the design of nanoscale building blocks and molecular network nanostructures for high toughness materials and the use of these well-characterized nanostructural components to inform physically-based analytical and computational models. Professor Arruda has led a team of investigators in this work for the past seven years and recently the team earned the 2012 Ted Kennedy Family Team Excellence Award from the UM College of Engineering. Additional recent recognition for her teaching, research, and service contributions to the engineering enterprise include the 2015 Outstanding Engineering Alumnus Award from the Pennsylvania State University, the 2014 Distinguished Faculty Achievement Award, from the University of Michigan, and the 2014 Trudy Huebner Service Excellence Award from the College of Engineering, University of Michigan.

Professor Arruda has ~100 papers in scientific journals. Her H-index is 26 (ISI). Professor Arruda is a Fellow of the American Society of Mechanical Engineers, the American Academy of Mechanics, and the Society of Engineering Science.

TEACHING

New Courses Introduced at U of M

ME 396 Mechanical Sciences Laboratory: Introduced Fall, 1994, taught Winter, 1995, enrollment of 60; Fall, 1996, enrollment of 67.

ME 599 Special Topics in the Constitutive Modelling of Polymers: Introduced Fall, 1995, taught Fall, 1995, enrollment of 11.

Ph. D. Committees Chaired

1. Phillip A. Przybylo, Ph D, Thesis, "Experimental Investigation and Constitutive Modeling of Rubbery Polymers," December 1, 1998.
2. Xiaoyong Lu, Ph D, Thesis, "Nonisothermal Experimental and Analytical Study of Viscoelastic Fiber Drawing," December 17, 1998.
3. Paris R. von Lockette, Ph D Thesis, Thesis topic, "Experimental, Analytical and Computational Investigation of Bimodal Elastomer Networks," May 21, 1999.
4. Jeffrey E. Bischoff, Ph D Thesis topic, "Constitutive Modeling and Testing of Biological Soft Tissue," August, 2001, [Karl Grosh, co-chair]
5. Yan Wang, Ph D Thesis topic, "Characterization, Testing and Constitutive Modelling of an Impact Modified Polypropylene," December, 2001.
6. Wei Xu, Ph D Thesis topic, "Mechanical Behavior, Texture Evolution and Constitutive Modeling of α and β Crystalline Isotactic Polypropylene," December, 2002.
7. Sarah Calve, Ph D Thesis topic, "Morphological and Mechanical Characterization of Self-Assembling Tendons and Myotendinous Junctions", July, 2006.
8. Amit Kaushik, PhD Thesis topic, "Deformation Mechanisms in Polymer-Clay Nanocomposites," April 2010.
9. Beth Wichterman, anticipated graduation, May, 2012
10. Jinjin Ma, PhD Thesis topic, "Experimental and Computational Characterizations of Native and Engineered Ligaments and Tendons in the Knee," April, 2012 Winner of the 2012 ProQuest Distinguished Dissertation Award given to the outstanding PhD dissertations at UM (one of 10 given in 2012).
11. Keqin Cao, PhD Thesis topic, "The Design and Synthesis of Reactive Aramid Nanostructures for Advanced Nanocomposites with Tailored Morphology and Properties," May, 2013
12. Jessica Deneweth, (co-chair with Scott McLean) PhD Thesis topic, "Mapping the Biomechanical Properties of Human Knee Cartilage," April, 2013
13. Michael Smietana, (co-chair with Lisa Larkin) PhD Thesis topic, "Development and Manufacturing of Scaffold-less Constructs for Tendon/Ligament Repair," July, 2014
14. Tanaz Rahimzadeh, (co-chair with Michael Thouless) PhD Thesis topic, "Design of Protective Structures for Optimal Blast and Impact Mitigation," January, 2016
15. Kaitlyn Mallett, anticipated graduation, 2016
16. Benjamin Marchi, anticipated graduation, 2017
17. Callan Luetkemeyer, anticipated graduation, 2018.
18. Marie Rice, anticipated graduation, 2018.

M. S. Committees Chaired

- Deanna G. Venske, graduated, December, 1993
- Phillip A. Przybylo, graduated, December, 1993
- Sharon L. Smolinski, graduated, May, 1995
- Paris R. von Lockette, graduated, December, 1995
- Ying Li, graduated, December, 1997
- Fatima Syed-Picard, graduated, August, 2006
- Harish Iyer, graduated, May, 2011

- Bo-Ram Oh, August, 2011

Graduate Special Projects Directed

Phillip A. Przybylo, ME 590, Winter, 1993. Design and development of an experimental apparatus for the in situ measurement of birefringence of model elastomers during large stretch deformations.

Deanna G. Venske, ME 590, Winter, 1993. Deformation studies of fiber reinforced thermoset matrix composites.

Byron L. Newberry, ME 590, Summer, 1993. Design and development of pre- and post- processing routines to provide an interface between undergraduate computer assignments and a commercial finite element package.

Deanna G. Venske, ME 590, Fall, 1993. Deformation response of thermosets and thermoset matrix composites in tension, compression and fatigue. Effects of fiber type, orientation and volume fraction.

Thornton C. Hughes, ME 590, Winter, 1994. Characterization of strain-induced crystallization during deformation processing of syndiotactic polystyrene using measurements of the evolution of material state.

Sharon L. Smolinski, ME 590, Fall, 1994. Design of apparatus for testing of compressible elastomers in uniaxial compression followed by simple shear with simultaneous optical measurement of the lateral expansion of the specimen.

Paris R. von Lockette, ME 590, Fall, 1994. Finite element modelling of the large deformation response of bimodal elastomeric networks.

Thomas Bress, Winter, 1995. Experiments and computations of fiber-reinforced thermoplastic injection molding (with David Dowling).

Stephen Schaller, Fall, 1994, Winter, 1995. Experimental investigation of the electro-rheological effect in polymer composite molding (with Steve Ceccio).

Xiaoyong Lu, Winter, 1995, Design and development of simulations of the viscoelastic and elastic-viscoplastic behavior of polymers for graduate classroom instruction.

Ying Li, ME 590, Fall, 1996, Experimental characterization of the rate dependent, large deformation behavior of filled and unfilled polypropylene.

Ying Li, ME 590, Winter, 1997, Effect of morphology on the mechanical response of polypropylene: quenched versus annealed microstructures.

Jeffrey E. Bischoff, ME590, Winter, 1997, Numerical investigation of normal skin and hypertrophic scar constitutive response.

Felix E. Hildebrand, ME590, Winter, 2004, Constitutive modeling and finite element implementation of semi-solid processing.

Rohit Khattar, ME590, Winter, 2006, Experimental Analysis of Polymeric Materials and Non-Composites using MTS and ASHPB.

Jessica Deneweth, ME 590, Winter, 2010, Finite Element Modeling of Knee Menisci.

Bo-Ram Oh, ME 590, Winter, 2010, Constitutive Modeling of Network Remodeling in Cytoskeleton

Jacob P. Mertens, ME 590, Winter, 2011, Finite Element Analysis of Knee Ligaments

Levon K. Cimonian, ME 590, Winter, 2015, Tensile Split Hopkinson Bar design for Thin Films

Undergraduate Special Projects Directed

- Sharon L. Smolinski, Winter, 1993. Design and implementation of the data acquisition and control software and hardware for the simultaneous, real time monitoring of stress, strain and birefringence during deformation testing. Ms. Smolinski worked under the guidance of myself and one RA but was largely self-directed in her efforts to add functionality to my existing laboratory equipment. Much of the equipment she purchased and configured is used regularly in my laboratory.
- David B. Miller, Winter, 1995. Design of specialized polymer testing apparatus. Mr. Miller worked under the guidance of myself and one RA to design testing equipment for special purpose polymer deformation tests. The equipment he has designed are still used in my laboratory and have also been borrowed by other UM investigators.
- Swapneel Ekbote, Winter, 1995. Design of a preform fiber drawing apparatus with variable feed rate, variable draw rate, and temperature control capabilities. Mr. Ekbote designed and manufactured this apparatus which has become a standard piece of equipment in our laboratory and is currently in use for a student's PhD project. Mr. Ekbote worked under the guidance of one RA.
- Beth R. Frayne, Summer and Fall, 1996. Compression testing of annealed and quenched polypropylene. Ms. Frayne designed and machined molds and fixturing for heat treating polypropylene specimens. She manufactured specimens with her apparatus and conducted compression tests. She worked under the guidance of myself and one RA.
- Adam J. Muller, Summer and Fall, 1997. Design and manufacture of a retrofitting hot plate for a tension/compression testing machine. Mr. Muller worked under the guidance of one RA to add hot press functionality to an existing testing apparatus in my laboratory.
- David M. Vincent, Winter, 1999. Split Hopkinson pressure bar design and testing. Mr. Vincent conducted high strain rate experiments on ionomers using the SHPB apparatus and has also done some design work on the apparatus to increase its range. He has worked largely independently and will return to my group in the fall of 1999.
- Debra M. McCartney, Summer, 1999. Development of teaching modules for outreach to middle school students including discovery and hands-on team based learning strategies for simple machines, bottle rockets and fiber optic communication.

- Sara J. Johnson, Summer, 2003. Engineering of self-organized tendon constructs from tenocytes of old rats. Ms. Johnson conducted a study of cell functional viability with age by culturing cells from rats of various ages and developing tendon constructs from them.
- Fatima N. Syed, Winter, 2004. Effects of internal pressure on construct growth and remodeling. Tissue engineering of ligaments and ligament/bone interfaces. Ms. Syed will be continuing this project at Tissue Genesis, Inc. this summer and will return to my laboratory in the fall. She will also work on modifying a perfusion system for tissue culture while at TGI.
- Theodorus Hendarto, Spring 2004. Finite element modeling of neoprene latex fibers reinforced polyethylene terephthalate (PET) fabrics. This work is being conducted in conjunction with Prof. Julie Chen's group at U Mass Lowell. Mr. Hendarto will use an existing constitutive model of anisotropic hyperelasticity to build finite element models of the fabrics. He will examine the ability of the model to predict the experimental results of Chen's group.
- Kristen Goble, Winter 2006. Experimental investigation of the viscoelastic response of the Anterior Cruciate Ligament (ACL) in situ. Kristen is using a rat model to examine the tensile properties of the ACL during loading/unloading cycles. She will characterize the hysteresis, strain softening and recovery properties.
- Jinjin Ma, Winter 2006. Effect of Basic Fibroblast Growth Factor (BFGF) on fibroblast differentiation in culture. Jinjin is examining the effects of the amount of BFGF given to cells in culture and also the timing of the intervention.
- Alla Epshteyn, Summer, 2007. (Tufts University) Synthesis, Characterization and Testing of Polyurethane Nanocomposites. Ella was sponsored by the National Science Foundation's National Nanotechnology Infrastructure Network Research Experience for Undergraduates Program and was selected from an NNIN pool of applicants to work on our polymer nanocomposites project.
- Denise Marie Koueiter, Winter 2009. Tissue Engineered Bone Construction and Mechanical Testing on Native Rat Tail tendon. Denise mechanically tested the rat tail tendon and found the young's modulus of the tail tendon.
- Ben Pumplin, Fall, 2009. Design of compliant load cells for nanocomposite film testing.
- Jason Liu, Fall 2009 and Winter 2010. Mechanical Properties of Kevlar-based Nanocomposites. Jason focused on the fabrication of Kevlar-based nanocomposites by using Layer-by-layer assembly method and prepared Kevlar-based samples with different types of polymer and inorganic nanofillers.
- Ryan Anderson, Fall 2009, Winter and Summer 2010. Automation of Kevlar-based Nanocomposites Fabrication Process. Ryan worked on the design and manufacturing of lid-opening robots which automate the fabrication process of Kevlar-based nanocomposites.
- Carlos Alberto Pons Siepermann, Fall 2010 and Winter 2011. Identification of the Microstructures of Kevlar-based networks via FTIR (Fourier transform infrared spectroscopy). Carlos is working on using FTIR to characterize the microstructures of different Kevlar-based networks to study the effect of functionalization and crosslinking via different methods.
- Kevin Lapprich, Summer, 2010. Design of a high-speed actuator test system for nanocomposite film testing.
- Yeon Soo Chung, ME490, Winter 2010. Viscoelastic characterization of hydrogels. Yeon-Soo analyzed the mechanical properties of polyacrylamide gels made from different initial ratio of constituents.

- Chengyun Hua, Summer and Fall 2010. Design of Mechanical Testing Programs for Soft Tissue using Labview Software. Chengyun has designed and coded uniaxial tension, stress relaxation and creep programs in LABVIEW to test the mechanical properties of soft tissue.
- Hiroko Nakahama, Summer and Fall 2010. Tissue Engineering Bone-Ligament-Bone (BLB) utilizing Green Fluorescence Protein (GFP) Rat Bone Marrow Stromal Cells (BMSCs) . Hiroko has fabricated BLBs from GFP BMSCs and implanted them in GFP negative rats to study the cell migration process between the implanted graft and the host body.
- Steve Hwang, Fall 2011. Biomechanical characterization of healthy and BPI prostate tissue.
- Carlos Alberto Pons Siepermann, Fall 2011 – Winter 2013. Synthesis and characterization of advanced Kevlar based nanocomposites.
- Andrew Kuo, Winter 2012. Design of a drill guide for companion animal ACL replacement surgery.
- Chris Gannon, Winter 2012. Design of a tensile split Hopkinson pressure bar apparatus.
- Gregory Cass, Winter 2012. Characterization of the high strain rate response of PU foams.
- Bret Kirchner, Summer 2012. Characterization of PU/PAA nanocomposites.
- John Lavoie-Mayer, Summer 2012. Design of a tensile split Hopkinson pressure bar apparatus.
- Tyler Olsen, Winter 2012 – Winter 2013. Characterization, constitutive modeling and numerical implementation of the biomechanics of viscoelastic ligament.
- Cameron McBride, Winter 2013 - present. Synthesis and high frequency testing of polymer nanocomposites
- Beverly Chou, Summer 2013. Marion Sarah Parker Scholar. Thermomechanical characterization and split Hopkinson pressure bar testing of nanocomposites.
- Jason Francolini, Fall 2013. High strain rate testing of Kevlar nanocomposites by tensile SHPB testing.
- Casey Aman, Fall 2013 – present. Design and implementation of an upgrade to a soft tissue tensiometer device.
- Cameron McBride, Fall 2013 – Summer, 2015. High frequency characterization of polyurethanes
- Haolu Zhang, Winter 2014 – present. Synthesis and characterization of Kevlar / Cu nanocomposites.
- Keith Brodek, Fall 2014 – Winter 2015. Anterior cruciate ligament biomechanics (Kaitlyn Mallett supervisor).
- Fabian Venegas, Summer 2015. Soft tissue biomechanics (Kaitlyn Mallett supervisor).
- Kip Schimmoeller, Summer 2015. ACL biomechanics (Kaitlyn Mallett supervisor).
- Antonia Crews, Fall 2015 – Winter 2016. Shock tube loading device for ACL mechanics study (Kaitlyn Mallett supervisor).
- Jack Weeks, Fall 2015 – Winter 2016. Measuring fracture properties of the ACL (Callan Luetkemeyer supervisor).
- Patrick Walker, Fall 2015 – Winter 2016. Full-volume displacement mapping with nano-CT images and DVC (Callan Luetkemeyer supervisor).
- Federico Kulyckyj, Fall 2015 – Winter 2016. The effect of fatigue on ACL strain fields (Callan Luetkemeyer supervisor).

Short Courses and Workshops

Designing Rubber Products: Modeling Rubber Elastic Materials, Products and Processes, MIT Summer Session, M. C. Boyce and E. M. Arruda, June 15-16, 1995.

RESEARCH

Current Grants and Contracts

Title: Process-Resilient Non-Woven Fibrous Networks

Sponsor: Procter & Gamble

Purpose: To characterize the resilience of non-wovens to deformation magnitude, state and rate as well as pressure and temperature, to determine the mechanism(s) of deformation resilience and the reasons for the loss of resilience, and to define fiber and network metrics that may be used in the design of both the materials and the process parameters to optimize structural, functional and tactile properties.

July 01, 2013 to June 30, 2016

Ellen Arruda, PI

Title: Utilization of Engineered Skeletal Muscle Units to Repair Volumetric Muscle Loss

Sponsor: NIH/NIAMS

Purpose: To assess the efficacy of a tissue-engineered skeletal muscle unit as replacement tissue after volumetric muscle loss

April 01, 2015 to March 31, 2020

Lisa M Larkin, PI (This scored in the 9th percentile!)

Title: Validation and Cryopreservation of Ligament Engineered from Human Bone Marrow

Sponsor: NIH

Purpose: To develop robust methods to cryopreserve tissue engineered ligaments

April 01, 2015 to March 31, 2016

Lisa M. Larkin, PI (This received an impact score of 10 – the best possible score!)

Title: Virtual Fields Methods for Soft Musculoskeletal Tissue Characterization and Model Validation

Sponsor: NSF

Purpose: To determine anterior cruciate ligament (ACL) strain patterns to develop patient-specific approaches to preventing ACL failures

August 01, 2015 to July 31, 2018

Ellen M. Arruda, PI

Title: A Model Framework for Shock Wave Propagation in Layered Material Systems

Sponsor: DoD – Army

Purpose: To develop a computational tool for shock wave propagation in isotropic and anisotropic elastic and viscoelastic layers

September 08, 2015 to September 07, 2016

Ellen M Arruda, PI

Title: MITIGATIUM

Sponsor: NFL/GE/Under Armour Head Health Challenge III

Purpose: To design an optimally dissipative material system for impact mitigation.

January 01, 2016 to December 31, 2016

Ellen M. Arruda, PI

Publications

Articles in Refereed Journals, Transactions or Archives (H=26 ISI)

1. Marchi BC and Arruda EM, "An Error Minimizing Approach to Inverse Langevin Approximations," *Rheologica Acta*, 54(11-12): 887-902, 2015.
2. Mahalingham V, VanDusen KW, Myers AM, Larkin LM, Kuzon WM and Arruda EM, "Burst Inflation Test for Measuring Biomechanical Properties of Rat Abdominal Walls," under review, 2016.
3. Sain T, Meaud J, Yeom B, Waas AM and Arruda EM. "Rate Dependent Finite Strain Constitutive Modeling of Polyurethane and Polyurethane-Clay Nanocomposites," *International Journal of Solids and Structures*, 54: 147-155, 2015.
4. Mahalingham V, Behbahani-Nejah N, Ronan EA, Olsen TJ, Smietana MJ, Wojtys EM, Wellik DM, Arruda EM, Larkin LM, "Fresh vs. Frozen Engineered Bone-Ligament-Bone Grafts for Sheep ACL Repair," *Tissue Engineering C_Methods*, 21(6): 548-556, 2015.
5. Mahalingam V, Behbahani-Nejad N, Horine SV, Olsen TJ, Smietana MJ, Wojtys EM, Wellik DM, Arruda EM, and Larkin LM, "Allogeneic vs. Autologous Derived Cell Sources for Use in Engineered Bone-Ligament-Bone Grafts in Sheep ACL Repair," *Tissue Engineering A*, 21(5-6): 1047-1054, 2015.
6. Smietana MJ, Moncada-Larrowitz P, Arruda EM, Bedi A and Larkin LM, "Utilization of Scaffold-Less Constructs for Tendon-Bone Interface Regeneration," in review, 2015.
7. Rahimzadeh T, Waas AM, Arruda EM and Thouless MD, "Design of Armor for Protection Against Blast and Impact," *Journal of the Mechanics and Physics of Solids*, 85: 98-111, 2015.
8. Yang M, Cao K, Yeom B, Thouless MD, Waas AM, Arruda EM and Kotov NA, "Aramid Nanofiber-Reinforced Transparent Nanocomposites," *Journal of Composite Materials*, 2015 (DOI: 10.1177/0021998315579230).
9. Cao K, Pons Siepermann C, Yeom B, Yang M, Waas AM, Kotov NA, Thouless MD and Arruda EM, "Aramid Nanofiber and Gold Nanoparticle Composite: Systematic Strategies to Optimize Polymeric Fibers vs. Metallic Particle Networks for Advanced Materials Properties," in preparation.
10. McLean SG, Mallett KF and Arruda EM, "Deconstructing the Anterior Cruciate Ligament: What We Know and Don't Know About Function, Material Properties, and Injury Mechanics," *ASME J Biomechanical Engineering*, 137(2): 020906-1 – 020906-19, 2015.
11. Deneweth JM, Arruda EM and McLean SG, "Hyperelastic Modeling of Location-Dependent Human Distal Femoral Cartilage Mechanics," *International Journal of Non-Linear Mechanics*, 68: 146-156, 2015.
12. Sain T, Yeom B, Waas, AM and Arruda EM, "Effect of Soft Segment and Clay Volume Fraction on Rate Dependent Damping of Polyurethane and Polyurethane-Clay Nanocomposites," *Journal of Reinforced Plastics and Composites*, 33(23): 2129-2135, 2014.
13. Zhao Z and Arruda EM, "An Internal Cure for Damaged Polymers," *Science*, 344(6148): 591-

592, 2014.

14. Meaud J, Sain T, Yeom B, Park SJ, Shoultz AB, Hulbert G, Ma ZD, Kotov N, Hart AJ, Arruda EM and Waas AM, "Simultaneously High Stiffness and Damping in Carbon Nanotube Engineered Truss Composites," *ACS Nano*, 8(4): 3468-3475, 2014.
15. Weist MR, Wellington MS, Bermudez JE, Kostrominova TY, Mendias CL, Arruda EM and Larkin LM, "TGF- β 1 Enhances Contractility in Engineered Skeletal Muscle," *Tissue Engineering and Regenerative Medicine*, 7(7): 562-571, 2013.
16. Williams ML, Kostrominova TY, Arruda EM and Larkin LM, "Effect of Implantation on Engineered Skeletal Muscle-Tendon Constructs," *Tissue Engineering and Regenerative Medicine*, 7(6): 434-442, 2013.
17. Deneweth JM, McLean SG and Arruda EM, "Evaluation of Hyperelastic Models for the Non-Linear and Non-Uniform High Strain-Rate Mechanics of Tibial Cartilage," *Journal of Biomechanics*, 46(10): 1604-1610, 2013.
18. Cao K, Pons Siepermann C, Yang M, Waas AM, Kotov NA, Thouless MD and Arruda EM, "Reactive Aramid Nanostructures as High-Performance Polymeric Building Blocks for Advanced Composites" *Advanced Functional Materials*, 23(16): 2072-2080, 2013. DOI: 10.1002.
19. Sain T, Meaud J, Hulbert G, Arruda EM and Waas AM, "Simultaneously High Stiffness and Damping in a Class of Wavy Layered Composites" *Composite Structures*, 101: 104-110, 2013.
20. Deneweth JM, Newman KE, Sylvia SM, McLean SG and Arruda EM, "Heterogeneity of Tibial Plateau Cartilage in Response to a Physiological Compressive Strain Rate," *Journal of Orthopaedic Research*, 31(3): 370-375, 2013. doi: 10.1002/jor.22226. Epub 2012 Sep 5.
21. Ma J and Arruda EM, "A Micromechanical Viscoelastic Constitutive Model for Native and Engineered Anterior Cruciate Ligaments," *Computer Models in Biomechanics from Nano to Macro*, G. Holzapfel and E. Kuhl Eds, Springer IUTAM Bookseries, Springer, New York: 351-363, 2012.
22. Ma J, Smietana MS, Swinehart IT, Kostrominova TY, Wellik DM, Wojtys EM, Larkin LM, and Arruda EM, "A Comparison of Tissue Engineered Scaffold-less Bone-Ligament-Bone Constructs and Patellar Tendon Autografts Used for Anterior Cruciate Ligament Replacement in Sheep," *American Journal of Sports Medicine*, under review, 2012. Winner: **2012 Excellence in Research Award** from the American Orthopaedic Society for Sports Medicine.
23. Ma J, Gharaee-Kermani M, Kunju L, Hollingsworth J, Adler J, Arruda EM, and Macoska JA, "Prostatic Fibrosis is Associated with Lower Urinary Tract Dysfunction," *Journal of Urology*, **188**(4): 1375-1381, 2012.
24. Adams AM, Kostrominova TY, Mertens JP, Arruda EM and Larkin LM, "Engineered Scaffold-Less Neural Conduit Promotes Regeneration and Functional Recovery after Peripheral Nerve Injury in Rats," in review, 2011.
25. Adams AM, Ross A, Arruda EM, and Larkin LM, "Scaffold-Less Tissue Engineered Conduits Promote DRG Nerve Growth In Vitro Compared to Biological and Synthetic Scaffold-Based Conduits," in review, 2011.
26. Adams AM, Arruda EM and Larkin LM, "Utilization of Adipose-Derived Stem Cells to Fabricate Scaffold-Less Tissue Engineered Neural Conduits in Vitro," *Neuroscience*, **201**(10): 349-356, 2012.
27. Olberding JE, Garikipati K, Grosh K, Larkin LM and Arruda EM, "Effect of oxygen level on the fibrogenesis of bone marrow stromal cells and fibroblasts for scaffold-less engineered tendon and ligament targets," in review, 2011.

28. Yang M, Cao K, Sui L, Qi Y, Zhu J, Waas AM, Arruda EM, Keiffer J, Thouless MD and Kotov NA, "Dispersions of Aramid Nanofibers: a New Piece of Nanoscale Toolset," *ACS Nano*, 5(9): 6945-6954, 2011. DOI: 10.1021/nn2014003
29. (Cover Article) Ma J, Smietana MJ, Kostrominova TY, Wojtys EM, Larkin LM and Arruda EM, "Three-Dimensional Engineered Bone-Ligament-Bone Constructs for Anterior Cruciate Ligament Replacement," *Tissue Engineering Part A*, 18(1-2): 103-116, 2012.
30. Rosenthal DT, Iyer H, Escudero S, Wu Z, Bao L, Garcia H, Ventura AC, Arruda EM, Garikipati K and Merajver SD, "Computational Mechanical Modeling Reveals the Role of p38 γ in Shaping the Cytoskeleton and Controlling Locomotion of Aggressive Breast Cancer Cells," *Cancer Research*, 71(20): 6338-6349, 2011. DOI: 10.1158/0008-5472.CAN-11-1291
31. Wood L, Arruda EM and Brooks SV, "Regional stiffening with aging in tibialis anterior tendons of mice occurs independent of changes in collagen fibril morphology," *Journal of Applied Physiology*, 111(4): 999-1006, 2011. DOI: 10.1152/jappphysiol.00460.2011
32. Ambrosi D, Ateshian GA, Arruda EM, Cowin SC, Dumais J, Goriely A, Holzapfel GA, Humphrey JD, Kemkemer R, Kuhl E, Olberding JE, Taber LA and Garikipati K, "Perspectives on Biological Growth and Remodeling" *Journal of the Mechanics and Physics of Solids*, Vol 59, pp 863-883, 2011.
33. Li, Y, Waas, AM, and Arruda, EM, "The Effects of the Interphase and Strain Gradients on the Elasticity of LBL Polymer/Clay Nanocomposites," *International J Solids Structures*, 6: 1044-1053, 2011.
34. Li, Y, Waas, AM, and Arruda, EM, "A Closed-Form, Hierarchical, Multi-Interphase Model for Composites ---Derivation, Verification and Application to Nanocomposites," *Journal of the Mechanics and Physics of Solids*, Vol 59, No 1, pp 43-63, 2011.
35. Kaushik, AK, Waas, AM and Arruda, EM, "Constitutive Model for Finite Deformation Response of Layered Polyurethane-Montmorillonite Nanocomposites," *Mechanics of Materials*, Vol 43, pp 186-193, 2011.
36. Olberding JE, Thouless MD, Arruda EM, Garikipati K (2010) The Non-Equilibrium Thermodynamics and Kinetics of Focal Adhesion Dynamics. PLoSONE 5(8): e12043. doi:10.1371/journal.pone.0012043
37. Smietana, MJ, Arruda, EM, Falkner, JA, Brooks, SV and Larkin, LM, "The Effect of Reactive Oxygen Species on Bone Mineral Density in Superoxide Dismutase (SOD) Knockout Mice," *Biochemical and Biophysical Research Communications*, Vol 401, pp 149-153, 2010.
38. Kheng E, Iyer HR, Podsiadlo P, Kaushik AK, Kotov NA, Arruda EM and Waas AM, "Fracture Toughness of Exponential Layer-by-Layer Polyurethane/Poly(Acrylic Acid) Films," *Engineering Fracture Mechanics*, Vol 77, pp 3227-3245, 2010.
39. Baltich, J., Hatch-Vallier, L., Adams, A.M., Arruda, E.M., and Larkin, L.M., "Development of a Scaffoldless Three-Dimensional Engineered Nerve using a Nerve-Fibroblast Co-Culture," *In Vitro Cell Dev. Biol. - Animal*, Vol. 46, pp 438-444, 2010.
40. Calve, S., Lytle, I.F., Grosh, K., Brown, D.L., and Arruda, E.M., "Implantation Increases Tensile Strength and Collagen Content of Self-Assembled Tendon Constructs," *Journal of Applied Physiology*, Vol. 108, No 4, pp 875-881, 2010.
41. Olberding, J.E., Thouless, M.D., Arruda, E.M., and Garikipati, K., "A Theoretical Study of the Thermodynamics and Kinetics of Focal Adhesion Dynamics," Proceedings of the IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, K. Garikipati and E. M. Arruda Eds, Springer IUTAM Bookseries, Springer, New York, pp 81-192, 2010.

42. Ma, J., Narayanan, H., Garikipati, K., Grosh, K., and Arruda, E.M., "Experimental and Computational Investigation of Viscoelasticity of Native and Engineered Ligament and Tendon," Proceedings of the IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, K. Garikipati and E. M. Arruda Eds, Springer IUTAM Bookseries, Springer, New York, pp 3-18, 2010.
43. Podsiadlo, P., Qin, M., Cuddihy, M., Zhu, J., Critchley, K., Kheng, E., Qi, Y., Kim, H.-S., Noh, S.-T., Arruda, E.M., Waas, A.M., and Kotov, N.A., "Highly Ductile Films by LBL Assembly of Oppositely Charged Polyurethanes for Biomedical Applications," *Langmuir*, Vol. 25, No 24, pp 14093-14099, 2009.
44. Li, Y., Waas, A.M., and Arruda, E.M., "A Particle Size-Shape-Dependent Three-Phase Two-Step Mori-Tanaka Method for Studying the Interphase of Polymer/Clay Nanocomposites," *Proceedings of the ASME International Mechanical Engineering Congress and Exposition*, Vol. 13, Pts A and B, pp 225-232, 2009.
45. Li, Y., Waas, A.M., and Arruda, E.M., "A Non-Local Visco-Plastic Model with Strain Laplacian Effects and Interphase Effects for Simulating the Stiffness and Yield Strength of a Class of Polymer Nanocomposites," *Proceedings of the ASME International Mechanical Engineering Congress and Exposition*, Vol. 13, Pts A and B, pp 1119-1126, 2009.
46. Smietana, M.J., Syed-Picard, F.N., Ma, J., Kostrominova, T.Y., Arruda, E.M., and Larkin, L.M., "The Effect of Implantation on Scaffoldless Three-Dimensional Engineered Bone Constructs," *In Vitro Cellular and Developmental Biology – Animal*, Vol. 45, No. 9, pp 512-522, 2009.
47. Kaushik, A.K., Podsiadlo, P., Qin, M., Shaw, C.M., Waas, A.M., Kotov, N.A., and Arruda, E.M., "The Role of Nanoparticle Layer Separation in the Finite Deformation Response of Layered Polyurethane-Clay Nanocomposites," *Macromolecules*, Vol. 42, pp 6588-6595, 2009.
48. Ma, J., Goble, K., Smietana, M., Kostrominova, T.Y., Larkin, L.M., and Arruda, E.M., "Morphological and Functional Characteristics of Three-Dimensional Engineered Bone-Ligament-Bone Constructs Following Implantation," *Journal of Biomechanical Engineering*, Vol. 131, Issue 10, pp 101017-1 to 101017-9, 2009. [DOI: 10.1115/1.4000151]
49. Podsiadlo, P., Arruda, E.M., Kheng, E., Waas, A.M., Lee, J., Critchley, K., Qin, M., Kaushik, A.K., Kim, H-S., Qi, Y., Noh, S-T., and Kotov, N.A., "LBL Assembled Laminates With Hierarchical Organization from Nano- to Microscale: High-Toughness Nanomaterials and Deformation Imaging," *ACS Nano*, Vol. 3, No. 6, pp 1564-1572, 2009.
50. Syed-Picard, F.N., Larkin, L.M., Shaw, C.M., and Arruda, E.M., "Engineered Functional Bone from Bone Marrow Stromal Cells and Their Autogenous Extra-Cellular Matrix," *Tissue Engineering*, Vol. 15, No. 1, pp 187-195, 2009.
51. Kostrominova, T.Y., Calve, S.C., Arruda, E.M., and Larkin, L.M., "Ultrastructure of Myotendinous Junctions in Tendon-Skeletal Muscle Constructs Engineered *in vitro*," *Histology and Histopathology*, Vol. 24, pp 541-550, 2009.
52. Narayanan, H., Arruda, E.M., Grosh, K., and Garikipati, K., "The Micromechanics of Fluid-Solid Interactions During Growth in Porous Soft Biological Tissue," *Biomechanics and Modeling in Mechanobiology*, Vol. 112, No. 3, pp 167-181, 2009.
53. Podsiadlo, P., Kaushik, A.K., Shim, B.B., Agarwal, A., Tang, Z., Waas, A.M., Arruda, E.M., and Kotov, N.A., "Can Nature's Design be Improved Upon? High Strength Nacre-Like Nanocomposites," *Journal of Physical Chemistry B*, Vol. 112, N:46, pp 14359-14363, 2008.
54. Podsiadlo, P., Kaushik, A.K., Arruda, E.M., Waas, A.M., Shim, B.S., Xu, J., Nandivada, H., Pumphlin, B.G., Lahann, J. Ramammoorthy, A., and Kotov, N.A., "Ultrastrong and Stiff Layered Polymer Nanocomposites," *Science*, Vol. 318, pp 80-83, 2007.

55. Arruda, E.M., Mundy, K., Calve, S.C. and Baar, K., "Denervation Does Not Change the Ratio of Collagen I and Collagen III mRNA in the Extracellular Matrix of Muscle," *AJP: Regulatory, Integrative and Comparative Physiology*, Vol. 292, pp R983-R987, 2007.
56. Wang, Y. and Arruda, E.M., "Constitutive Modelling of a Thermoplastic Olefin (TPO) over a Broad Range of Strain Rates," *Journal of Engineering Materials Technology*, Vol. 128, No. 4, pp 551-558, 2006.
57. Larkin, L., Calve, S.C., Kostrominova, T.Y., and Arruda, E.M., "Structure and Functional Evaluation of Tendon-Skeletal Muscle Constructs Engineered in Vitro," *Tissue Engineering*, Vol. 12, No. 11, pp 3149-3158, 2006.
58. Arruda, E.M., Mundy, K., Calve, S.C., and Baar, K., "Regional Variation of Tibialis Anterior Tendon Mechanics is Lost Following Denervation," *Journal of Applied Physiology*, Vol. 53, No. 4, pp 1113-1117, 2006.
59. Garikipati, K., Olberding, J.E., Narayanan, H., Arruda, E.M., Grosh, K. and Calve, S., "Biological Remodelling: Stationary Energy, Configurational Change, Internal Variables and Dissipation," *Journal of the Mechanics and Physics of Solids*, Vol. 54, No. 7, pp 1493-1515, 2006.
60. Kuhl, E., Garikipati, K., Arruda, E.M. and Grosh, K., "Remodeling of Biological Tissue: Mechanically Induced Reorientation of a Transversely Isotropic Chain Network," *Journal of the Mechanics and Physics of Solids*, Vol. 53, No. 7, pp 1552-1573, 2005.
61. Wu, Z., Ahzi, S., Arruda, E.M., and Makrady, A., "Modeling the Large Inelastic Deformation Response of Non-Filled and Silica Filled SL5170 Cured Resin," *Journal of Materials Science*, Vol. 40, No. 17, pp 4605-4612, 2005.
62. Borschel, G.H., Huang, Y.C., Calve, S.C., Arruda, E.M., Lynch, J.B., Dow, D.E., Kuzon, W.M., Dennis, R.G., and Brown, D.L., "Tissue Engineering of Recellularized Microvascular Grafts," *Tissue Engineering*, Vol. 11, No. 5-6, pp 778-786, 2005.
63. Baar, K., Birla, R., Boluyt, M. O., Borschel, G. H., Arruda, E. M., and Dennis, R. G., "Heart Muscle by Design: Self-Organization of Rat Cardiac Cells into Contractile 3D Cardiac Tissue," *Federation of American Societies for Experimental Biology Journal*, Feb. 19(2): 275-277, 2005.
64. Xu, W., Martin, D.C., and Arruda, E.M., "Finite Strain Response, Microstructural Evolution and β to α Phase Transformation of Crystalline Isotactic Polypropylene," *Polymer*, Vol. 46, pp 455-470, 2005.
65. Bischoff, J.E., E.M. Arruda and K. Grosh, "A Rheological Network Formulation for Orthotropic Viscoelasticity in Soft Tissue," *Biomechanics and Modeling in Mechanobiology*, Vol. 3, No. 1, pp 56-67, 2004.
66. Garikipati, K., Narayanan, H., Arruda, E.M., Grosh, K., and Calve, S.C., "Material Forces in the Context of Biotissue Remodelling," Available at arxiv.org/PS_cache/q-bio/pdf/0312/0312002.pdf
67. Garikipati, K., Arruda, E.M., Grosh, K., Narayanan, H., and Calve, S.C., "A Continuum Treatment of Growth in Biological Tissue: Mass Transport Coupled with Mechanics," *Journal of the Mechanics and Physics of Solids*, Vol. 52, No. 7, pp 1595-1625, 2004.
68. Calve, S.C., Dennis, R. G., Kosnik, P., Baar, K., Grosh, K., and Arruda, E.M., "Engineering of Functional Tendon," *Tissue Engineering*, Vol. 10, No. 5/6, pp 755-761, 2004.
69. Ahzi, S., Ganesan, A., and Arruda, E. M., "Modeling Simulation of Deformation Texture in Semi-Crystalline Polymers: Application to Polypropylene and Nylon-6," *Materials Science Forum*, Vols. 408-412, pp 1723-1728, 2002.

70. Bischoff, J. E., Arruda, E. M. and Grosh, K., "Finite Element Simulations of Nonlinear Orthotropic Hyperelasticity," *Finite Elements in Analysis and Design*, Vol. 38, pp 983-998, 2002.
71. Bischoff, J. E., Arruda, E. M., and Grosh, K., "Orthotropic Hyperelasticity in Terms of an Arbitrary Molecular Chain Model," *Journal of Applied Mechanics*, Vol. 69, pp 199-201, March 2002.
72. Bischoff, J. E., Arruda, E. M., and Grosh, K., "A Microstructurally Based Orthotropic Hyperelastic Constitutive Law," *Journal of Applied Mechanics*, Vol. 69, pp. 570-579, September 2002.
73. P. R. von Lockette and E. M. Arruda, "Mesoscale Modeling of Bimodal Elastomer Networks: Constitutive and Optical Theories and Results," *Macromolecules*, Vol. 35, No. 18, pp. 7100-7109, 2002.
74. M. C. Boyce and E. M. Arruda, "Swelling and Mechanical Stretching of Elastomeric Materials," *Mathematics and Mechanics of Solids*, Vol. 6, pp 641-659, 2001.
75. Bischoff, J. E., Arruda, E. M., and Grosh, K., "A New Constitutive Model for the Compressibility of Elastomers at Finite Deformations," *Rubber Chemistry and Technology*, Vol. 74, No. 4, pp 541-559, September-October, 2001.
76. P. R. von Lockette and E. M. Arruda, "Computational Annealing of Simulated Unimodal and Bimodal Networks," *Computational and Theoretical Polymer Science*, Vol. 11, No. 6, pp. 415-428, 2001.
77. Y. Wang, E. M. Arruda, and P. A. Przybylo "Characterization and Constitutive Modeling of a Plasticized Polyvinylchloride for a Broad Range of Strain Rates," *Rubber Chemistry and Technology*, Vol. 74, No. 4, pp 560-573, September-October, 2001.
78. M. C. Boyce and E. M. Arruda, "Constitutive Models of Rubber Elasticity: A Review," *Rubber Chemistry and Technology*, Vol. 73, pp 504-523, 2000.
79. P.A. Przybylo, E.M. Arruda, and C.C. Chou, "Experimental Investigation of Plasticized Polyvinylchloride Using the Split Hopkinson Bar Technique," selected for SAE 2000 Transactions: Journal of Passenger Car - Mechanical Systems, v. 109, 2000. (Presented as SAE Paper 2000-01-0610, SAE International Congress and Exposition, Detroit, MI, March 6-9, 2000; and included in Safety Test Methodologies, SAE Special Publication 1516, 2000.)
80. Bischoff, J.E., E. M. Arruda and K. Grosh, "Finite Element Modelling of Human Skin using a Non-Linear Elastic Constitutive Model," *Journal of Biomechanics*, Vol. 33 pp 645-652, 2000.
81. X. Lu, E. M. Arruda and W. W. Schultz, "The Effect of Process Parameters on Glass Fiber Birefringence Development and Relaxation," *Journal of Non-Newtonian Fluid Mechanics*, Vol. 86, pp 89-104, 1999.
82. P. R. von Lockette and E. M. Arruda, "Topological Studies of Bimodal Networks," *Macromolecules*, Vol. 32, No. 6, pp 1990-1999, 1999.
83. P. R. von Lockette and E. M. Arruda, "A Network Description of the Non-Gaussian Stress-Optic and Raman Scattering Responses of PDMS Networks," *Acta Mechanica*, Vol. 134, pp 81-107, 1999.
84. P. A. Przybylo and E. M. Arruda, "Experimental Investigations and Numerical Modelling of Incompressible Elastomers during Non-Homogeneous Deformations," *Rubber Chemistry and Technology*, Vol. 71, No. 4, pp 730-749, 1998.
85. E. M. Arruda, S. Ahzi, Y. Li, and A. Ganesan, "Rate Dependent Deformation of Semi-Crystalline Polypropylene Near Room Temperature," *ASME Journal of Engineering Materials and Technology*, Vol. 119, No. 3, pp 216-222, 1997.

86. G. K. Gupta, W. W. Schultz, E. M. Arruda, and X. Lu, "Nonisothermal Model of Glass Fiber Drawing Stability," *Rheologica Acta*, Vol. 35, pp 584-596, 1996.
87. E. M. Arruda and P. A. Przybylo, "An Investigation into the Three Dimensional Stress-Birefringence-Strain Relationship in Elastomers," *Polymer Engineering and Science*, Vol. 35, No. 5, pp 1-8, 1995.
88. E. M. Arruda, M. C. Boyce, and R. Jayachandran, "Effects of Strain Rate, Temperature and Thermomechanical Coupling on the Finite Strain Deformation Response of Glassy Polymers," *Mechanics of Materials*, Vol. 19, pp 193-212, 1995.
89. M. C. Boyce, E. M. Arruda and R. Jayachandran, "The Large Strain Compression, Tension and Simple Shear of Polycarbonate," *Polymer Engineering and Science*, Vol. 34, No. 9, pp 716-725, 1994.
90. E. M. Arruda, H. Quintus-Bosz and M. C. Boyce, "Effects of Initial Anisotropy on the Finite Strain Deformation Behavior of Glassy Polymers," *International Journal of Plasticity*, Vol. 9, No. 7, pp 783-811, 1993.
91. E. M. Arruda and M. C. Boyce, "Evolution of Plastic Anisotropy in Amorphous Polymers During Finite Straining," *International Journal of Plasticity*, Vol. 9, No. 6, pp. 697-720, 1993.
92. E. M. Arruda and M. C. Boyce, "A Three-Dimensional Constitutive Model for the Large Stretch Behavior of Rubber Elastic Materials," *Journal of the Mechanics and Physics of Solids*, Vol. 41, No. 2, pp. 389-412, 1993.
93. M. C. Boyce and E. M. Arruda, "An Experimental and Analytical Investigation of the Large Strain Compressive and Tensile Response of Glassy Polymers," *Polymer Engineering and Science*, Vol. 30, No. 20, pp. 1288-1298, 1990.

Refereed Conference or Symposium Presentations

1. Zhou Z and Arruda EM, "Characterization and Modeling of Nanoparticle Reinforced Polymeric Nanofiber Composites," 52nd Annual Meeting of the Society of Engineering Science, TAMU, College Station, TX, October 26-28, 2015.
2. Mallett K and Arruda EM, "Experimental Characterization of Anterior Cruciate Ligament Biomechanics," 52nd Annual Meeting of the Society of Engineering Science, TAMU, College Station, TX, October 26-28, 2015.
3. Marchi BC and Arruda EM, "On accurate anatomical, physiological, and constitutive models of whole knee biomechanics," 52nd Annual Meeting of the Society of Engineering Science, TAMU, College Station, TX, October 26-28, 2015.
4. Luetkemeyer C and Arruda EM, "Use of full-field methods for the characterization of the anterior cruciate ligament mechanical response," 52nd Annual Meeting of the Society of Engineering Science, TAMU, College Station, TX, October 26-28, 2015.
5. Mahalingham V, VanDusen KW, Arruda EM, Larkin LM, Kuzon WM, "Mechanical Optimization of Tissue-Engineered Cellular Neotendinous Constructs for Hernia Repair," TERMIS, Boston, MA, September 8-11, 2015.
6. Novakova SS, Smietana MJ, Mahalingham V, Arruda EM, Larkin LM, "The Age of hMSC Donor Affects Biomechanical Properties of Tissue Engineered Ligament Constructs," TERMIS, Boston, MA, September 8-11, 2015.
7. Marchi BC and Arruda EM, "Biomechanics and Computational Modeling of the Impact Response of the Knee, COMPLAS XIII, Barcelona, Spain, September 1-3, 2015.

8. Luetkemeyer CM, Ashton-Miller JA and Arruda EM, "The Effects of Enteseal Shape on Strain Fields in the Anterior Cruciate Ligament," ASB, Columbus, OH, August 5-8, 2015.
9. Zhou Z and Arruda EM, "Characterization and Modeling of Nanoparticle / Nanofiber Composites," ESMC 2015, Madrid, SP, July 6-10, 2015.
10. Novakova S, Moncada-Larrotiz P, Smietana MS, Mahalingam V, Arruda EM, and Larkin LM, "Characterization of a Human MSC Population Required for Scaffold-less Construct Fabrication," ORS, Las Vegas, NV, March 28-31, 2015.
11. Arruda EM, "Full-Field Methods for Anterior Cruciate (and Other) Ligament Biomechanical Characterization," ISLT, Las Vegas, NV, March 27, 2015.
12. Arruda EM, "Material Property Identification of Anterior Cruciate Ligament Biomechanics: Challenges and Progress," AmeriMech, 2014, Austin, TX, December 10-12, 2014.
13. Marchi B and Arruda EM, "Physiologically Motivated Spatial and Depth Dependent Viscoelastic Behavior of Articular Cartilage," SES, West Lafayette, IN, October 1-3, 2014.
14. Mallett K and Arruda EM, "Characterization and Computational Modeling of Anterior Cruciate Ligament Biomechanics," SES, West Lafayette, IN, October 1-3, 2014.
15. Arruda EM, "Experimental Characterization and Computational Modeling of High Strain Rate Tissue Deformation in the Knee," WCCM, Barcelona, Spain, July 21-25, 2014.
16. Mallett, K and Arruda, EM, "Characterization and Computational Modeling of Anterior Cruciate Ligament Biomechanics," WCCM, Barcelona, Spain, July 21-25, 2014.
17. Rahimzadeh T, Waas AM, Arruda EM and Thouless MD, "A Football Helmet Design Strategy for Concussion Prevention," USNCTAM, East Lansing, MI, USA (June 2014).
18. Marchi B and Arruda EM, "Effects of Cartilage Mechanical Heterogeneity on Computational Models of Knee, USNCTAM, East Lansing, MI, USA (June, 2014).
19. Mallett K and Arruda EM, "Experimental Characterization and Computational Modeling of Anterior Cruciate Ligament Biomechanics," USNCTAM, East Lansing, MI, USA (June, 2014).
20. Zhou ZZ and Arruda EM, "Characterization and Modeling of Gold Nanoparticle Reinforced Kevlar Nanofiber Composites," USNCTAM, East Lansing, MI, USA (June 2014).
21. Arruda EM, "Experimental Characterization and Computational Modeling of High Strain Rate Deformation and Failure of Ligament Tissue in the Knee," USNCTAM, East Lansing, MI, USA (June 2014).
22. Rahimzadeh T, Waas AM, Arruda EM, ThoulessMD, "Design of Materials for Blast-Resistant Armor," 9th International Conference on the Mechanics of Time-Dependent Materials, Montreal, Canada (June 2014).
23. Mahalingam V, Behbahani-Nejad N, Smietana MJ, Olsen TJ, Wallik DM, Wojtys EM, Arruda EM and Larkin LM, "Fresh vs. Frozen Tissue Engineered 3D Bone-Ligament_Bone Grafts for Sheep ACL Repair," 2014 ORS Annual Meeting, New Orleans, LA, March 15-18, 2014.
24. Sain T, Arruda EM, Yeom B and Waas AM, "Effect of Soft Segment Fraction on Rate Dependent Damping of Polyurethane and Polyurethane-Clay Nanocomposites," AIAA Science and Technology Forum, National Harbor, MD, January 13-17, 2014.
25. Smietana MJ, Arruda EM and Larkin LM, "Process Development Strategies to Enable Large Scale Fabrication of Scaffold-Less 3D Ligament Constructs and ACL Reconstruction," Scale-Up and Manufacturing of Cell-Based Therapies III, San Diego, CA, January 5-9, 2014.
26. Mahalingam V, Smietana MJ, Lee JD, VanDusen KW, Olsen TJ, Wojtys EM, Wellik DM, Arruda EM and Larkin LM, "Allogenic vs Autologous Derived Cell Sources for Use in Engineered Bone-Ligament-Bone (BLB) for Sheep ACL Repair," TERMIS, Atlanta, GA, November 10-13, 2013.

27. Smietana MJ, Arruda EM, Bedi A and Larkin LM, "Utilization of 3D Tissue Engineered Constructs to Improve Tendon-Bone Healing Following Rotator Cuff Repair," TERMIS, Atlanta, GA, November 10-13, 2013.
28. Cao K, Pons Siepermann C, Yeom B, Kotov NA, Thouless MD, Arruda EM, "Advanced Aramid Nanofiber/Gold Nanoparticle Composites," ASME IMECE, San Diego, CA, November 15-21, 2013.
29. Arruda EM, Ma J, and Olsen TJ, "Experimental Characterization and Computational Modeling of High Strain Rate Deformation and Failure of Ligament Tissue in the Knee," ASME IMECE, San Diego, CA, November 15-21, 2013.
30. Deneweth JM, Pomeroy SM, Arruda EM, McLean SG. "Evaluation of Hyperelastic Models for Tibial Articular Cartilage Under High Strain Rate Loading." Congress of the International Society of Biomechanics, Natal, Brazil, August 4-9, 2013. Poster presentation.
31. Deneweth JM, Newman KE, Pomeroy SM, Sylvia SM, Arruda EM, McLean SG. "Physiological Mechanical Properties of Healthy Cartilage Across the Distal Femur." Congress of the International Society of Biomechanics, Natal, Brazil, August 4-9, 2013. Oral presentation.
32. Deneweth JM, Olsen TJ, McLean SG and Arruda EM, "Effects of Non-linearity and Mechanical and Thickness Heterogeneities on *in Silico* Models of Knee Biomechanics," USNCCM12, Raleigh, NC, July 22-25, 2013.
33. **(Keynote)** Ma J and Arruda EM, "Biomechanics of Native and Tissue Engineered Anterior Cruciate Ligament," USNCCM12, Raleigh, NC, July 22-25, 2013.
34. Deneweth JM, Pomeroy SE, Arruda EM And McLean SC, "Topographical Mapping Of the Elastic Moduli of Femoral Cartilage Under Physiological Loading," Orthopaedic Research Society, San Antonio, TX, January 27 – 29, 2013.
35. (Best Poster Award) Deneweth JM, Sylvia SM, Newman KE, McLean SG and Arruda EM, "Mapping the Mechanical Topography of Healthy Tibial Cartilage," American Society of Biomechanics, Gainesville, FL, August 15-18, 2012.
36. Williams ML, Arruda EM and Larkin LM, "Utilization of satellite cells for engineering scaffold-less skeletal muscle tissue for repair of volumetric muscle loss," Skeletal Muscle Satellite and Stem Cells, FASEB SRC, Lucca, IT, August 12-17, 2012.
37. Smietana MJ, Arruda EM, Bedi A, Larkin LM. "Utilization of 3-D Tissue Engineered Constructs to Improve Tendon-Bone Healing following Rotator Cuff Repair." Gordon Research Conference Musculoskeletal Biology & Bioengineering, Proctor Academy - Andover, NH, August 5-10, 2012.
38. **(2012 Research Excellence Award)** Ma J, Smietana MS, Swinehart IT, Kostrominova TY, Wellik DM, Wojtys EM, Larkin LM, and Arruda EM, "A Comparison of Tissue Engineered Scaffold-less Bone-Ligament-Bone Constructs and Patellar Tendon Autografts Used for Anterior Cruciate Ligament Replacement in Sheep," American Orthopaedic Society for Sports Medicine, Baltimore, MD, July 9-14, 2012.
39. Deneweth JM, Newman KE, Sylvia SM, McLean SG and Arruda EM, "Human Tibial Cartilage Reveals Non-Linear and Non-Uniform Regional Topography under Physiological Loading Rates," ASME-SBC, Fajardo, Puerto Rico, June 20-23, 2012.
40. Ma J, Smietana MJ, Wojtys EM, Larkin LM and Arruda EM, "Tissue Engineered Bone-Ligament-Bone Constructs Following 9-Month Sheep ACL Reconstruction," Spotlight Presentation, ORS Annual Meeting, February 4-7, 2012, San Francisco, CA.
41. Smietana MJ, Ma J, Kostrominova TY, Arruda EM and Larkin LM, "Bone Tunnel Healing of Tissue Engineered Scaffold-less Bone Ligament Bone Constructs and Patellar Tendon

- Autografts used for Anterior Cruciate Ligament Replacement in Sheep,” ORS Annual Meeting, February 4-7, 2012, San Francisco, CA.
42. (Invited) Arruda EM and Ma J, “Mechanics Of Native Anterior Cruciate Ligament (ACL)” 48th Annual Technical Conference of the Society of Engineering Science, October 12-14, 2011, Evanston, IL.
 43. Rudraraju S, Mills KL, Kemkemer R, Arruda EM and Garikipati K, “Multiphysics Modeling of in vitro Tumor Spheroid Growth,” 48th Annual Technical Conference of the Society of Engineering Science, October 12-14, 2011, Evanston, IL.
 44. Arruda EM, “Native and Tissue-Engineered Anterior Cruciate Ligaments,” IUTAM Symposium on Computer Models in Biomechanics: from Nano to Macro, Stanford University, California, USA, August 29 – September 02, 2011.
 45. Ma J, Smietana M, Hua C, Wojtys EM, Larkin LM and Arruda EM, “Challenges in Characterizing Viscoelastic Behaviors of Ligament and Tendon” Society of Experimental Methods, June 13-16, 2011, Uncasville, CT.
 46. (Keynote) Arruda EM and Ma J, “Non-linear Viscoelastic Response of Knee Ligaments and Tendons” ASME McMat May 30-June 2, 2011, Chicago, IL.
 47. Arruda EM and Ma J, “Design and Characterization of a Tissue Engineered Ligament after Implantation as an ACL Replacement” ASME McMat May 30-June 2, 2011, Chicago, IL.
 48. Deneweth J, Arruda EM and McLean SC, “Characterization of Regional Variations in Cartilage Stiffness Across the Human Tibia,” ISB 2011, July 3-7, 2011, Brussels, Belgium.
 49. Deneweth J, McLean SC and Arruda EM, “Homogeneous Finite Element Formulations of Articular Cartilage Do Not Reflect Natural Indentation Mechanics,” Orthopaedic Research Society, January 13-16, 2011, Long Beach, CA.
 50. Ma J, Smietana MJ, Wojtys EM, Kostrominova TY, Larkin LM and Arruda EM, “3-D Engineered Bone-Ligament-Bone Constructs in Sheep ACL Reconstruction,” Orthopaedic Research Society, January 13-16, 2011, Long Beach, CA.
 51. Ma J, Smietana MJ, Wojtys EM, Larkin LM and Arruda EM, “Non-Linear Mechanics of Tissue Engineered Ligament, Anterior Cruciate Ligament and Patellar Tendon,” International Symposium on Ligament and Tendon, January 12, 2011, Irvine, CA.
 52. Ma J, Smietana M, Wojtys EM, Kostrominova TY, Larkin LM and Arruda EM, “Non-linear Viscoelasticity Characterization of Knee Ligament and Tissue Engineered Ligaments,” ASME IMECE, November 12-18, 2010, Vancouver, BC, Canada.
 53. Adams A, Kostrominova TY, Arruda EM and Larkin LM, “Scaffold-less Engineered Neural Conduit Promotes Regeneration and Functional Recovery after Peripheral Nerve Injury in Adult Rats,” TERMIS-NA 2010, December 5-8, 2010, Orlando, FL.
 54. Williams ML, Adams A, Kostrominova TY, Arruda EM and Larkin LM, “Effect of Implantation on the Structure and Function of Scaffoldless Three-Dimensional Engineered Muscle-Tendon Constructs,” TERMIS-NA 2010, December 5-8, 2010, Orlando, FL.
 55. Smietana M, Ma J, Wojtys EM, Kostrominova TY, Arruda EM and Larkin LM, “Reconstruction of the Bone Tunnel and Enthesis Utilizing 3D Bone-Ligament Bone Constructs in Sheep ACL Replacement,” TERMIS-NA 2010, December 5-8, 2010, Orlando, FL.
 56. Rosenthal, D, Iyer, H, Escudero, S, Ventura, A, Arruda, EM, Garikipati, K and Merajver, S, “From in vitro to in silico and back again: using biological and mathematical synergy to decipher breast cancer cell motility,” 32nd Annual International IEEE EMBS Conference, September 1-4, 2010, Buenos Aires, Argentina.

57. Wood, L, Arruda, EM and Brooks, SV, "Regional Stiffening of Mouse Tibialis Anterior Tendons with Age," 34th Annual Meeting of the American Society of Biomechanics, August 18-21, 2010, Providence, RI.
58. Ma J, Smietana M, Wojtys EM, Kostrominova TY, Larkin LM and Arruda EM, "Morphological and Mechanical Characterization of 3D Engineered Bone-Ligament-Bone Constructs after 6-Month ACL Reconstruction in Sheep," (talk) Gordon Research Conference on Musculoskeletal Biology & Bioengineering, August 1-5, 2010, Andover, NH.
59. Ma J, Smietana M, Wojtys EM, Kostrominova TY, Larkin LM and Arruda EM, "Morphological Characterization of a 3D Engineered Bone-Ligament-Bone after 6-Month ACL Reconstruction in Sheep," (poster) Gordon Research Conference on Musculoskeletal Biology & Bioengineering, August 1-5, 2010, Andover, NH.
60. Ma J, Smietana M, Wojtys EM, Kostrominova TY, Larkin LM and Arruda EM, "Mechanical Characterization of 3D Engineered Bone-Ligament-Bone Constructs after 6-Month ACL Reconstruction in Sheep," (poster) Gordon Research Conference on Musculoskeletal Biology & Bioengineering, August 1-5, 2010, Andover, NH.
61. Arruda, EM and Ma, J, "Non-Linear, Inhomogeneous Viscoelasticity of Knee Ligaments and Tissue Engineered Ligaments," 16th US National Congress on Theoretical and Applied Mechanics (USNCTAM), June 27 - July 2, 2010, University Park, PA.
62. Ma, J and Arruda, EM, "Nonlinear Viscoelasticity of Native and Engineered Ligament and Tendon," SEM Annual Conference & Exposition on Experimental and Applied Mechanics, June 7-10, 2010, Indianapolis, IN.
63. Kaushik, AK, Yang, M, Podsiadlo, P, Waas, AM, Kotov, NA and Arruda, EM, "The Role of Interface and Reinforcement in the Finite Deformation Response of Polyurethane-Montmorillonite Nanocomposites," SEM Annual Conference & Exposition on Experimental and Applied Mechanics, June 7-10, 2010, Indianapolis, IN.
64. Olberding, JE, Garikipati, K, Grosh, K, Larkin, LM, and Arruda, EM, "Role of Oxygen Content on the Fibrogenesis of Bone Marrow Stromal Cells," Biomedical Engineering Society 2009 Annual Fall Scientific Meeting, October 7-10, Pittsburgh, Pennsylvania, USA
65. Ma, J, Kostrominova, T, Larkin, LM, and Arruda, EM, "Morphological and Functional Characteristics of Three-Dimensional Engineered Bone-Ligament-Bone Constructs Following Implantation," Biomedical Engineering Society 2009 Annual Fall Scientific Meeting, October 7-10, Pittsburgh, Pennsylvania, USA
66. Ma, J, and Arruda, EM, "The Advantage of Tissue Engineered Ligament Applied in Ligament Reconstructions due to Different Viscoelastic Responses of Native Ligament and Tendon," Biomedical Engineering Society 2009 Annual Fall Scientific Meeting, October 7-10, Pittsburgh, Pennsylvania, USA.
67. Mendias, C.L., Bakhurin, K.I., Arruda, E.M., Brooks, S.V., Faulkner, J.A., Larkin, L.M., "Scleraxis is Expressed in Adult Tendons and is Upregulated in Response to Mechanical Loading," Experimental Biology, New Orleans, LA, April 18-22, 2009.
68. Smietana, M., Kaushik, A., Arruda, E.M., Faulkner, J.A., Larkin, L.M., "The Effect of Reactive Oxygen Species on Bone Mineral Density in Superoxide Dismutase (SOD) Knockout Mice," Experimental Biology, New Orleans, LA, April 18-22, 2009.
69. Li, Y., Waas, A.M., and Arruda, E.M., "A Non-Local Visco-Plastic Model with Strain Laplacian Effects and Interphase Effects for Simulating the Stiffness and Yield Strength of a Class of Polymer Nanocomposites," ASME International Mechanical Engineering Congress and Exposition, October 31-November 6, Boston, MA, 2008.

70. Li, Y., Waas, A.M., and Arruda, E.M., "A Particle Size-Shape_Dependent Three-Phase Two-Step Mori-Tanaka Method for Studying the Interphase of Polymer/Clay Nanocomposites," ASME International Mechanical Engineering Congress and Exposition, October 31-November 6, Boston, MA, 2008.
71. Garikipati, K., Olberding, J.E., Thouless, M.D., and Arruda, E.M., "The Thermodynamics and Kinetics of Focal Adhesion Dynamics," 45TH Annual Technical Meeting of the Society of Engineering Science, October 12-15, Urbana-Champaign, IL, 2008.
72. Arruda, E.M., Ma, J., "Native and Engineered Knee Ligament Mechanics," 45TH Annual Technical Meeting of the Society of Engineering Science, October 12-15, Urbana-Champaign, IL, 2008.
73. Kaushik, A.K., Podsiadlo, P., Arruda, E.M., Qin, M., Waas, A.M., Kotov, N.A., Iyer, H., Kheng, E., "Toughening of Polymeric Materials by Dispersion of Nanoparticles," 45TH Annual Technical Meeting of the Society of Engineering Science, October 12-15, Urbana-Champaign, IL, 2008.
74. Iyer, H., Kheng, E., Arruda, E.M., Waas, A.M., "Computing Fracture Toughness of Thin Films Made up of Single/Multi-Layered Nanocomposites," 45TH Annual Technical Meeting of the Society of Engineering Science, October 12-15, Urbana-Champaign, IL, 2008.
75. Ma, J., Larkin, L., Narayanan, H., Garikipati, K., Kostrominova, T.Y., O'Connor, D.T., Syed-Picard, F.N., Calve, S., Grosh, K., and Arruda, E.M., "Experimental and Computational Investigation of Poroviscoelasticity in Native and Engineered Connective Tissue," IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, June 18-21, Woods Hole, MA, 2008.
76. Olberding, J.E., Thouless, M.D., Arruda, E.M., and Garikipati, K., "A Theoretical Study of the Thermodynamics and Kinetics of Focal Adhesion Dynamics," IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, June 18-21, Woods Hole, MA, 2008.
77. Li, Y., Kaushik, A.K., Waas, A.M., Podsiadlo, P., Kotov, N.A., Arruda, E.M., "Study of Enhancement Mechanism and Synergistic Effects of Polymer/Clay Nanocomposite," Mechanics of Time Dependent Materials Conference, March 30 – April 4, Monterrey, CA, 2008.
78. Balhurin, K.I., Mendias, C.L., Arruda, E.M., Brooks, S. V., Faulkner, J.A., Larkin, L.M., "Scleraxis is expressed in adult tendons and is upregulated in response to mechanical loading," Experimental Biology, April 5-9, San Diego, CA, 2008.
79. Syed-Picard, F.N., Larkin, L.M., Shaw, C.M., and Arruda, E.M., "Engineered Functional Bone from Bone Marrow Stromal Cells and their Autogenous Extra-Cellular Matrix," Midwestern Tissue Engineering Consortium, April 20-21, Ann Arbor, MI, 2007.
80. Olberding, J.E., Thouless, M., Arruda, E.M., and Garikipati, K., "Focal Adhesion Dynamics,: Reaction Domination," 2007 BMES Annual Fall Meeting, Los Angeles, CA, September 26-29, 2007.
81. Kaushik, A., Podsiadlo, P., Waas, A.M., Kotov, N.A., and Arruda, E.M., "Ductile Polymer/Clay Nanocomposites," Materials Science and Technology, Detroit, MI, September 16-20, 2007.
82. Smietana, M.J., Wellington, M., Arruda, E.M., and Larkin, L.M., "Bone Mineral Density of Engineered Bone Constructs Before and After Implantation," Experimental Biology, Washington, DC, April 28 – May 2, 2007.
83. Syed-Picard, F.N., Larkin, L.M., and Arruda, E.M., "Development of Scaffold-Less 3D Bone Tissue Engineered from Rat Bone Marrow Stromal Cells," Experimental Biology, Washington, DC, April 28 – May 2, 2007.
84. (**Keynote**) Narayanan, H., Calve, S.C., Garikipati, K., Grosh, K., and Arruda, E.M., "Modelling the Viscoelastic Nature of Growing Tendon" 2nd Symposium on Mechanics of Soft Materials

and Soft Tissues at the 43rd Annual Technical Meeting of the Society of Engineering Science, University Park, PA, August 13-16, 2006.

85. Olberding, J.E., Garikipati, K., Arruda, E.M. and Grosh, K., "Thermodynamic Dissipation During Reorientation and Fusion of Collagen Fibrils in Biological Soft Tissue," 7TH World Congress on Computational Mechanics, Los Angeles, CA, July 17-20, 2006.
86. Olberding, J.E., Garikipati, K., Arruda, E.M. and Grosh, K., "Fibroblast-Mediated Evolution of Collagen Fibril Orientations in Three Dimensions using Confocal Reflection Microscopy," 2006 USNCTAM, University of Colorado at Boulder, June 25-30, 2006.
87. Narayanan, H., Arruda, E.M., Garikipati, K., and Grosh, K., "Tendon Growth and Healing: The Roles of Reaction, Transport and Mechanics," symposium on Damage and Healing Mechanisms in Synthetic and Biological Materials Systems, 15TH USNCTAM, University of Colorado at Boulder, June 25-30, 2006.
88. Calve, S.C., Narayanan, H., Garikipati, K., Grosh, K., and Arruda, E.M., "Viscoelastic and Growth Mechanics in Engineered and Native Soft Tissue" symposium on the Mechanics of Materials from Nature, 15TH USNCTAM, University of Colorado at Boulder, June 25-30, 2006.
89. Kaushik, A., Khattar, R., Waas, A., Kotov, N., and Arruda, E.M., "The Response of Filled and Unfilled Polyamide at Low and High Strain" "Symposium on the Mechanics of Macromolecular Solids at High Strain Rates, 15TH USNCTAM, University of Colorado at Boulder, June 25-30, 2006.
90. Calve, S.C., Kostrominova, T., Arruda, E.M., and Larkin, L., "Functional Evaluation of Engineered 3D Muscle-Tendon Constructs," Experimental Biology, San Francisco, CA, April 1-5, 2006.
91. Kostrominova, T., Calve, S.C., Arruda, E.M., and Larkin, L., "Myotendinous Junction Protein Expression in Engineered Muscle-Tendon Constructs," Experimental Biology, San Francisco, CA, April 1-5, 2006.
92. Wictherman, B. and E. M. Arruda, "Characterization and Constitutive Modeling of the Large Deformation Response of Polypropylene Blends in Uniaxial Compression at High Strain Rates" Symposium on Time Dependent Behavior of Polymers and PMC at the 2005 ASME IMECE, Orlando, FL, November 7-10, 2005.
93. Calve, S., Arruda, E.M., Mundy, K., Dennis, R. and Baar, K., "The Effect of Denervation and Aging on the Heterogeneous Material Properties of the Tibialis Anterior Tendon," XXth Congress of the International Society of Biomechanics, July 31 - August 5, 2005, Cleveland, OH.
94. Kuhl, E., Garikipati, K., Arruda, E.M. and Grosh, K., "Remodeling in Biological Tissues Based on a Micromechanically Motivated Chain Network Model," 8TH US National Congress of the USNCCM, July 24-28, 2005, Austin, TX.
95. Calve, S.C., Syed, F.N., Dennis, R.G., Grosh, K., Garikipati, K., and Arruda, E.M., "Mechanical Characterization of Growth in Fibrin-Based Tendon Constructs," 2005 Summer Bioengineering Conference, June 22-26, 2005, Vail, CO.
96. Calve, S.C., Baar, K., Mundy, K., and Arruda, E.M., "The Effect of Denervation on the Heterogeneous Material Properties of the Tibialis Anterior Tendon," 2005 Summer Bioengineering Conference, June 22-26, 2005, Vail, CO.
97. Calve, S., Baar, K., Narayanan, H., Garikipati, K., Grosh, K., Dennis, R.G. and Arruda, E.M., "Development of Constitutive Models to Describe Growth in Soft Tissues: Experimental Basis," McMat 2005, June 1-3, 2005, Baton Rouge, LA.

98. Arruda, E.M., Calve, S.C., Baar, K., Grosh, K., Garikipati, K., Narayanan, H., and Andrick, J.J., "Constitutive Modeling of the Non-Linear Mechanics of Soft Tissue," 41ST Annual Technical Meeting of the Society of Engineering Science, Special Symposium in Honor of Alan Wineman, October 11-13, 2004, Lincoln, NE.
99. Narayanan, H., Garikipati, K., Arruda, E.M., Grosh, K., and Calve, S.C., "Multi-Scale Simulations of the Mechanics of Transport and Growth in Soft Tissue," 41ST Annual Technical Meeting of the Society of Engineering Science, Special Symposium in Honor of Nialls Horgan, October 11-13, 2004, Lincoln, NE.
100. Kuhl, E., Menzel, A., Garikipati, K., Arruda, E.M., and Grosh, K., "Modeling and Simulation of Remodeling in Soft Biological Tissues," to appear in *Proceedings of 2004 IUTAM on Mechanics of Biological Tissue*, June 27 – July 2, 2004, Graz, Austria.
101. Arruda, E.M., Calve, S.C., Garikipati, K., Grosh, K., and Narayanan, H., "Characterization and Modeling of Growth and Remodeling in Tendon and Soft Tissue Constructs," to appear in *Proceedings of 2004 IUTAM on Mechanics of Biological Tissue*, June 27 – July 2, 2004, Graz, Austria.
102. J. Andrick, S. Calve, E. M. Arruda, and K. Baar, "Uniaxial Stretch Increases ERK Phosphorylation and Collagen Synthesis in Engineered Tendons," Experimental Biology 2004, April, 2004, Washington, DC.
103. S. Calve, K. Baar, R. G. Dennis, E. M. Arruda, "Morphological and Mechanical Characterization of Self-Assembling Tendon Constructs," Experimental Biology 2004, April, 2004, Washington, DC.
104. S. Calve, R.G. Dennis, K. Grosh and E. M. Arruda, "Mechanics of Self-Assembling Tendon Constructs," 40TH Annual Technical Meeting of the Society of Engineering Science, Ann Arbor, MI, October, 2003.
105. K. Garikipati, E.M. Arruda, K. Grosh, H. Narayanan and S. Calve, "A Continuum Framework for Growth in Soft Biological Tissue: Mass Transport Coupled with Mechanics," 40TH Annual Technical Meeting of the Society of Engineering Science, Ann Arbor, MI, October, 2003.
106. H. Narayanan, K. Garikipati, E.M. Arruda and K. Grosh, "Material Forces in Mass Transport," 7TH US National Congress on Computational Mechanics, Albuquerque, NM, July 2003.
107. (**Keynote**) E. M. Arruda, K. Grosh, K. Garikipati, H. Narayanan, and S.C. Calve, "A Continuum treatment of Growth in Soft Biological Tissue: Coupling of Mass Transport and Mechanics," 7TH US National Congress on Computational Mechanics, Albuquerque, NM, July 2003.
108. S. Calve, E. M. Arruda, R. G. Dennis, K. Baar, K. Grosh and K. Garikipati. "Mechanical And Biochemical Characterization Of Self-Assembling Tendon Constructs," 7TH US National Congress on Computational Mechanics, Albuquerque, NM, July 2003.
109. H. Narayanan, K. Garikipati, E. M. Arruda, K. Grosh, and S.C. Calve, "A Continuum Framework for Growth in Biological Tissue: The Roles of Mass Transport and Mechanics," ASME 2003 Summer Bioengineering Conference, Key Biscayne, FL, June, 2003.
110. S.C. Calve, R. G. Dennis, P. E. Kosnik II, K. Grosh and E. M. Arruda "Engineering Of Functional Tendon.," ASME 2003 Summer Bioengineering Conference, Key Biscayne, FL, June, 2003.
111. LY Eun , EM Arruda , GJ Ensing , CA Gomez and A Ludomirsky, "Does Cardiac Muscle Restoration of the Left Ventricle Differ From the Right Ventricle in the Normal Canine Heart?"

- A Passive Stress-Strain Relationship In-Vitro Study,” Pediatric Academic Societies’ Annual Meeting, Seattle, WA, May, 2003
112. S.C. Calve, E.M. Arruda, R.G. Dennis, K. Baar and K. Grosh, “Mechanical Characterization of Self-Assembling Tendon Constructs,” Engineering Tissue Growth, Pittsburgh, PA, March, 2003.
 113. E.M. Arruda and R.G. Dennis, “Characterization of Cardiac Muscle Tissue and Self-Organized Cardiac Muscle Constructs,” 39th Annual Technical Meeting of the Society of Engineering Science, University Park, PA, October, 2002.
 114. W. Xu and E.M. Arruda, “Finite Strain Response and Texture Evolution of α and β Crystalline Polypropylene,” 39th Annual Technical Meeting of the Society of Engineering Science, University Park, PA, October, 2002.
 115. S.C. Calve, R.G. Dnnis, K. Grosh and E.M. Arruda, “Tissue Engineering and Characterization of Self-Organized Tendon Constructs,” 39th Annual Technical Meeting of the Society of Engineering Science, University Park, PA, October, 2002.
 116. K. Garikipati, E.M. Arruda, K. Grosh and S.C. Calve, “Growth and Morphogenesis: A Continuum Field Theory,” 39th Annual Technical Meeting of the Society of Engineering Science, University Park, PA, October, 2002.
 117. J.E. Bischoff, E.M. Arruda and K. Grosh, “ Application of Orthotropy and Viscoelasticity to Soft Tissue Mechanics,” EUROMECH Colloquium on Constitutive Equations for Polymer Microcomposites on the Border of Mechanics and Chemistry, Vienna Austria, July, 2002.
 118. S.C. Calve, E.M. Arruda, R.G. Dennis and K. Grosh, “Influence of Mechanics on Tendon and Muscle Development,” WCCM V Fifth World Congress on Computational Mechanics, Vienna, Austria, July, 2002.
 119. E. M. Arruda and W. Xu, “Finite Strain Response and Texture Evolution of α and β Crystalline Polypropylene,” Proceedings of *Plasticity '02 The 9th International Symposium On Plasticity and Its Current Application*, Palm Beach, Aruba, 2002.
 120. E. M. Arruda, Y. Wang, P. A. Przybylo and C. C. Chou, “High Strain Rate Characterization and Modeling of Elastomers,” *Proceedings of the 158th Meeting of the American Chemical Society Rubber Division*, Cincinnati, OH, October, 2000.
 121. P. A. Przybylo and E. M. Arruda, “High Strain Rate Testing of Polymers, Elastomers and Foams by the Split Hopkinson Pressure Bar Technique,” *Proceedings of the 11th International Conference on Yield, Deformation and Fracture of Polymers*, The Plastics and Rubber Institute, Cambridge, UK, April, 2000.
 122. W. Xu and E. M. Arruda, “The Mechanics of β and α Crystal Deformation in Annealed Isotactic Polypropylene,” *Proceedings of the 11th International Conference on Yield, Deformation and Fracture of Polymers*, The Plastics and Rubber Institute, Cambridge, UK, April, 2000.
 123. W. Xu and E. M. Arruda, "Structure Change of Quenched Polypropylene during Deformation," *Constitutive and Damage Modeling of Inelastic Deformation and Phase Transformation, Proceedings of Plasticity '99*, Cancun, Mexico, January, 1999.
 124. P. A. Przybylo, E. M. Arruda, Y. Li and C. C. Chou, "The Impact Response of Injection Molded Polypropylene Trim Panel Material: Homogeneity, Isotropy and Constitutive Modelling," *SAE SP-1320, Safety Test Methodologies*, 1998 SAE Congress, Detroit, Feb, 23-26, 1998.
 125. P. R. von Lockette and E. M. Arruda, "Stress-Optical Behavior of Inhomogeneously Deformed Elastomers and Bimodal Elastomer Networks," *Proceedings of the 10th International*

Conference on Yield, Deformation and Fracture of Polymers, p399-402, The Plastics and Rubber Institute, Cambridge, UK, April, 1997.

126. W. W. Schultz, G. K. Gupta, E. M. Arruda and X. Lu, "Nonisothermal Viscoelastic Modeling of Glass Fiber Drawing," *Proceedings of the Symposium on Rheology and Computational Fluid Mechanics*, Nicosia, Cyprus, pp. 13-22, 1996.
127. G. K. Gupta, W. W. Schultz, X. Lu, and E. M. Arruda, "Nonisothermal Modelling of Viscoelastic Fiber Drawing Stability," *Proceedings of the XIIth International Congress on Rheology*, p715-716, Quebec, August 1996.
128. E. M. Arruda and M. C. Boyce, "Strain Rate and Temperature Dependence in Amorphous Polymers at Finite Strain," *Proceedings of the Use of Plastics and Plastic Composites: Materials and Mechanics Issues*, ASME WAM MD-Vol. 46, pp. 23-41, December, 1993.
129. E. M. Arruda and M. C. Boyce, "Strain Rate and Temperature Effects on the Finite Strain Deformation Response of Amorphous Polymers," *Proceedings of the 8th International Conference on Yield, Deformation and Fracture of Polymers*, The Plastics and Rubber Institute, Cambridge, UK, April, 1991.
130. E. M. Arruda and M. C. Boyce, "Evolution of Plastic Anisotropy in Amorphous Polymers During Finite Straining," *Anisotropy and Localization of Plastic Deformation, Proceedings of Plasticity '91*, pp. 483-488, August, 1991.
131. E. M. Arruda, H. Quintus-Bosz and M. C. Boyce, "Effects of Initial Anisotropy on the Finite Strain Deformation Behavior of Glassy Polymers," *Anisotropy and Localization of Plastic Deformation, Proceedings of Plasticity '91*, pp. 489-492, August, 1991.
132. E. M. Arruda and M. C. Boyce, "Anisotropic Effects on the Finite Strain Deformation Behavior of Glassy Polymers," *Proceedings of the Mechanics of Plastics and Plastic Composites Symposium*, ASME WAM MD-Vol. 29, December, 1991.

Other Conference or Symposium Presentations

- (Invited) Ma, J., Narayanan, H., Garikipati, K., Grosh, K., and Arruda, E.M., "Experimental and Computational Investigation of Viscoelasticity of Native and Engineered Ligament and Tendon," German-American Frontiers of Engineering Symposium, Potsdam, Germany, April, 2009.
- (Invited) Arruda, E.M., "Mechanics of MTM-PU Nanocomposites", WIRES Summit, June 2-4, Barcelona, Spain, 2009
- Epshteyn, A., Kaushik, A., Arruda, E.M., "Synthesis, Characterization and Testing of Polyurethane Nanocomposites, NSF NNIN REU Conference, August 8-11, Santa Barbara, CA, 2007.
- H. Narayanan, E.M. Arruda, S.C. Calve, K. Grosh and K. Garikipati, "A Continuum Treatment of Growth in Soft Biological Tissue: Coupling of Mass Transport and Mechanics," Second M.I.T. Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June, 2003.
- S.C. Calve, R. G. Dennis, K. Grosh and E. M. Arruda, "Engineering of Functional Tendon," Society of Women Engineers Graduate Student Poster Competition, University of Michigan, Ann Arbor, MI, March, 2003.
- S.C. Calve, R. G. Dennis, K. Grosh and E. M. Arruda. Self-Assembling Tendon Constructs: Characterization and Applications. Mechanical Engineering Graduate Council Student Symposium, University of Michigan, Ann Arbor, MI, October, 2002.

- S.C. Calve, E. M. Arruda, R. G. Dennis, K. Grosh and K. Pasyk, “Characterization of Self-Assembling Tendon Constructs,” Macromolecular Science and Engineering Symposium, University of Michigan, Ann Arbor, MI, October 2002.
- S.C. Calve, E. M. Arruda, R. G. Dennis, K. Grosh and K. Pasyk, “Tissue Engineering of Fibroblast Constructs and Anisotropic Collagen Gels.” Materials Research Society Spring Meeting, San Francisco, CA, April, 2002.
- W Xu and EM Arruda, “Finite Strain Response and Texture Evolution of Isotactic Crystalline Polypropylene,” ASME 2001 International Mechanical Engineering Congress and Exposition, New York City, NY, November 11-16, 2001.
- S.C. Calve, E. M. Arruda, R. G. Dennis and K, Grosh, “Influence of Mechanics on the Development of Muscle and Tendon” Macromolecular Science and Engineering Symposium, University of Michigan, Ann Arbor, MI, October 2001.
- S.C. Calve, E. M. Arruda, R. G. Dennis and K. Grosh, “Using Mechanics to Aid the Development of Muscle and Tendon,” Mechanical Engineering Graduate Council Student Symposium, University of Michigan, Ann Arbor, MI, October 2001.
- J. E. Bischoff, EM Arruda and K Grosh, “Measurement of Orthotropic Material Properties and Constitutive Modeling of Soft Tissue,” ASME 2001 Summer Bioengineering Conference, Snowbird, UT, June 28-30, 2001.
- (Invited) E. M. Arruda, K. Grosh and J. E. Bischoff, “An Anisotropic Constitutive Law for Human Tissue,” SES Young Investigator Medal Symposium in honor of L. Mahadevan at the 37th Annual Technical Meeting of the Society of Engineering Science, Columbia, SC, October, 2000.
- Y. Wang and E. M. Arruda, “Characterization and Modeling of Quenched Isotactic Polypropylene at Large Deformation,” The 37th Annual Technical Meeting of the Society of Engineering Science, Columbia, SC, October, 2000.
- P. R. von Lockette and E. M. Arruda, “Computational and Analytical Modeling of Bimodal Elastomeric Networks,” The 37th Annual Technical Meeting of the Society of Engineering Science, Columbia, SC, October, 2000.
- (Invited) E. M. Arruda, Y. Wang, P. A. Przybylo and C. C. Chou, “High Strain Rate Characterization and Modeling of Elastomers,” *Proceedings of the 158th Meeting of the American Chemical Society Rubber Division*, Cincinnati, OH, October, 2000.
- (Invited) E. M. Arruda and W. Xu, “The Mechanics of Crystal Deformation in Polypropylene,” The 36th Annual Technical Meeting of the Society of Engineering Science, Austin, TX, October, 1999.
- (Invited) E. M. Arruda and M. C. Boyce, “Micromechanics, Meso-Scale Modeling and Molecular Dynamics Simulations of Polymers,” NSF Workshop on Nano and Micromechanics of Solids for Emerging Science and Technology, Palo Alto, CA, October, 1999.
- **(Keynote)** E. M. Arruda, "Characterizing and Modelling Hyperelastic and Viscoelastic-Viscoplastic Elastomers at Low and High Strain Rates," 3RD International Symposium on Finite Element Analysis of Rubber and Rubber-Like Materials, Akron Rubber Development Laboratory, Akron, OH, May, 1999.
- (Invited) E. M. Arruda, “Characterizing and Modeling Rubbery Polymers,” HKS Michigan Seminar Series on Rubber and Viscoelasticity with Abaqus, Hibbitt, Karlson and Sorenson, Inc., Plymouth, MI, April, 1999.

- (Invited) E. M. Arruda, "Finite Element Analysis of Elastomers at Moderate and High Strain Rates," 2ND International Symposium on Finite Element Analysis of Rubber and Rubber-Like Materials, Akron Rubber Development Laboratory, Akron, OH, March, 1998.
- (Invited) P. A. Przybylo, E. M. Arruda, Y. Li and C. C. Chou, "The Impact Response of Injection Molded Polypropylene Trim Panel Material: Homogeneity, Isotropy and Constitutive Modelling," 1998 SAE International Congress and Exposition, Detroit, MI, February, 1998.
- E. M. Arruda, S. Ahzi, Y. Li, and A. Ganesan, "Rate Dependent Deformation of Semi-Crystalline Polypropylene Near Room Temperature," *The 1997 Joint ASME/ASCE/SES Summer Meeting*, Northwestern University, Evanston, IL, June, 1997.
- S. Ahzi, and E. M. Arruda, "Micromechanics of Semi-Crystalline Polymers," *The 1997 Joint ASME/ASCE/SES Summer Meeting*, Northwestern University, Evanston, IL, June, 1997.
- E. M. Arruda, Y. Li, and P. A. Przybylo, "Characterization of the Large Strain Deformation Response of Polypropylene: Rate Dependence and Microstructural Effects," *The 10th International Conference on Yield, Deformation and Fracture of Polymers*, The Plastics and Rubber Institute, Cambridge, UK, April, 1997.
- G. K. Gupta, W. W. Schultz, X. Lu, and E. M. Arruda, "Nonisothermal Study of Viscoelastic Slender Fiber Drawing," Society of Rheology Annual Meeting, Sacramento, CA, October, 1995.
- (Invited) E. M. Arruda, P. A. Przybylo and Y. Li, "Characterization and Modelling of the Rate Dependent Behavior of Semi-Crystalline and Amorphous Polymers," 1997 SAE International Congress and Exposition, Detroit, MI, February, 1997.
- E. M. Arruda, W. W. Schultz, G. K. Gupta and X. Lu, "Effect of Viscoelasticity on the Stability of Nonisothermal Glass Fiber Drawing," NSF Design & Mfg Grantees Conference, Seattle, Washington, January, 1997.
- (Invited) E. M. Arruda, "Rate Dependent Behavior of Amorphous and Semi-Crystalline Polymers," 1996 ASME International Congress and Exhibition, Atlanta, GA, November, 1996.
- (Invited) P. A. Przybylo and E. M. Arruda, "Non-Homogeneous Deformations of Compressible and Incompressible Elastomers," 1996 ASME Mechanics and Materials Conference, Johns Hopkins University, June, 1996.
- G. K. Gupta, W. W. Schultz, X. Lu, and E. M. Arruda, "Nonisothermal Analytical and Experimental Study of Viscoelastic Fiber Drawing," NSF Design & Mfg Grantees Conference, Albuquerque, New Mexico, January 1996.
- P. A. Przybylo, P. R. vonLockette and E. M. Arruda, "Experimental Characterization, Testing and Modelling of Bimodal Polydimethylsiloxane Networks," ASME IMECE 1995 Symposium on the Mechanics of Plastics and Plastic Composites, San Francisco, CA, November, 1995.
- E. M. Arruda, P. R. Przybylo and P. R. vonLockette, "Towards the Extension of Rubber Elasticity Theory to the Modelling and Design of Specialized Elastomeric Networks," *ASME AMD-MD '95, Joint Applied Mechanics and Materials Summer Conference*, Los Angeles, CA, June, 1995.
- (Invited) E. M. Arruda and P. A. Przybylo, "The Roles of Microstructure and Defect Structure on the Large Deformation Response of Unimodal and Bimodal Elastomers," *Society of Engineering Science 31st Annual Technical Meeting*, College Station, TX, October, 1994.
- E. M. Arruda and M. C. Boyce, "The Roles of Temperature and Strain Rate in the Development of Anisotropy during Large Strain Deformations of Glassy Polymers," *Society of Engineering Science 29th Annual Technical Meeting*, La Jolla, CA, September, 1992.

- E. M. Arruda and M. C. Boyce, "The Anisotropy of Large Deformations in Polycarbonate," *Proceedings of the 13th RISO International Symposium on Metallurgy and Materials Science: Modelling of Plastic Deformation and its Engineering Applications*, September, 1992.

Invited Seminars in other U of M Departments or Other Institutions

- EM Arruda "Anterior Cruciate Ligament and Tibiofemoral Cartilages Characterizations and Modeling, and the Role of Constitutive Model Assumptions on Whole Knee Biomechanics," UT, Austin, TX, Midwest Mechanics Seminar Series, February 16, 2016.
- EM Arruda "Anterior Cruciate Ligament and Tibiofemoral Cartilages Characterizations and Modeling, and the Role of Constitutive Model Assumptions on Whole Knee Biomechanics," TAMU, College Station, TX, Midwest Mechanics Seminar Series, February 17, 2016.
- EM Arruda "Anterior Cruciate Ligament and Tibiofemoral Cartilages Characterizations and Modeling, and the Role of Constitutive Model Assumptions on Whole Knee Biomechanics," University of Houston, Houston, TX, Midwest Mechanics Seminar Series, February 18, 2016.
- EM Arruda "Design of Polymer Composite Structures for Impact Resistance," 3M, St. Paul, MN, December 3, 2015.
- EM Arruda "The Anterior Cruciate Ligament: Mechanical Property Characterization, Constitutive Modeling, and Tissue Engineering Strategies for Repair," Aerospace and Mechanical Engineering Seminar Series, Notre Dame, South Bend, IN, October 6, 2015.
- EM Arruda, "The Anterior Cruciate Ligament: Mechanical Property Characterization, Constitutive Modeling, and Tissue Engineering Strategies for Repair," Materials Department Seminar, UCSB, Santa Barbara, CA, October 2, 2015.
- EM Arruda, "Mechanics of Impact: Application to Helmet Design," UCSB Department of Materials Science Beer Theory Lecture, Santa Barbara, CA, October 2, 2015.
- EM Arruda, "Mechanics of Impact: Application to Helmet Design," UM Exercise and Sport Science Initiative Symposium, University of Michigan, Ann Arbor, MI, September 25, 2015.
- EM Arruda "The Anterior Cruciate Ligament: Mechanical Property Characterization, Constitutive Modeling, and Tissue Engineering Strategies for Repair," The Pennsylvania State University, April 12, 2015.
- EM Arruda, "The Anterior Cruciate Ligament: Mechanical Property Characterization, Constitutive Modeling, and Tissue Engineering Strategies for Repair," MIT, March 31, 2015.
- EM Arruda, "Impact Biomechanics of the Knee: Effects of ACL and Cartilage Material Model Assumptions on Soft Tissue Strains," Purdue University, February 18, 2015.
- EM Arruda, "Tissue-Engineered Bone, Ligament, and Muscle Constructs" Pelvic Floor Research Group Day, University of Michigan, February 4, 2015.
- E. M. Arruda, "Experimental Characterization and Computational Modeling of High Strain Rate Tissue Deformation in the Knee" University of Nebraska, September 9, 2014.
- E. M. Arruda, "Characterization and Computational Modeling of Anterior Cruciate Ligament Biomechanics," Musculoskeletal Research in Progress Seminar Series, University of Michigan Medical School, Ann Arbor, MI, January 8, 2014.
- E. M. Arruda, "Effects of Soft Tissue Non-Linearity and Mechanical Heterogeneity on Computational Models of Knee Biomechanics," University of Illinois Urbana Champaign, Department of Mechanical Sciences and Engineering, December 3, 2013.

- E. M. Arruda, “Mechanical Properties of Native Anterior Cruciate Ligament (ACL), Native Patellar Tendon (PT), PT Autograft and Tissue Engineered ACL Allograft,” Department of Biomedical Engineering, University of Minnesota, October 29, 2012.
- E. M. Arruda, “Mechanics of Layered and Filtrated Polymer Nanocomposites,” Proctor and Gamble, Cincinnati, OH, May 21, 2012.
- E. M. Arruda, “Mechanics of Layered Polymer Nanocomposites,” University of California Santa Barbara, January 30, 2012.
- E. M. Arruda, “Knee Ligament Mechanics: Viscoelasticity, Functional Gradients and Implications of these for Tissue Engineering,” University of Illinois Urbana Champaign, September 15, 2009.
- E. M. Arruda, “Micromechanical Modeling of the Viscoelastic and Growth Responses of Native and Engineered Ligament and Tendon,” University of Michigan BME 500 Talk, November, 2008.
- E. M. Arruda, “Structural and Functional Changes Associated with Overuse Injuries in Ligament and Tendon,” Sports Injury Prevention Center, University of Michigan, Ann Arbor, MI, April 26, 2007.
- E. M. Arruda, “Characterization and Modelling of Soft Tissue Poro-Viscoelasticity and Growth via Tissue Engineered Constructs,” Mechanical Engineering Seminar Series, Cornell University, Ithaca, NY, November 12, 2007.
- E. M. Arruda, “Characterization and Modeling of Growth and Remodeling Mechanics in Tendon and Soft Tissue Constructs,” Mechanical Engineering Seminar Series, Michigan State University, East Lansing, MI, April 20, 2004.
- E. M. Arruda, “Mechanics of Growth in Soft Tissue,” Department Seminar Series, Theoretical and Applied Mechanics, The University of Illinois Urbana Champaign, Urbana, IL, October 3, 2002.
- E. M. Arruda, “The Mechanics of Active and Passive Soft Tissue,” Continuum Mechanics Seminar Series, The Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA, April 2, 2001.
- E. M. Arruda and Y Wang, “Characterization, Testing and Modeling of An Impact-Modified Polypropylene,” DOW Chemical, Midland MI, December, 2001.
- E. M. Arruda, “The Large Deformation Mechanics of Annealed and Quenched Isotactic Polypropylene,” Department of Engineering Mechanics, The University of Nebraska-Lincoln, May, 2000.
- E. M. Arruda, “Constitutive Modeling and characterization of the Finite Deformation Response of Nearly Incompressible Hyperelastic Materials,” Paulstra, Grand Rapids, MI, August, 1999.
- E. M. Arruda, “Material Selection, Characterization and Modeling for High Rate Polypropylene Applications,” Dow Chemical Company, Southfield, MI, August, 1999.
- E. M. Arruda, "Finite Element Analysis of Elastomers at Moderate and High Strain Rates," Akron Rubber Development Laboratory, Akron, OH, March, 1998.
- E. M. Arruda, "Strain Rate Dependent Large Deformation in Quenched and Annealed Polypropylene," Aerospace & Mechanical Engineering Department Seminar Series, Notre Dame University, Notre Dame, IN, April, 1997.
- E. M. Arruda, "Large Deformation Response of Amorphous and Semi-Crystalline Polymers," 3M, St. Paul, MN, May, 1997.

- E. M. Arruda, "Testing, Characterization and Constitutive Modelling of Polymer Deformation," University of Michigan, February, 1997.
- E. M. Arruda, "Experimental Characterization and Modelling of Anisotropy, Strain Rate, Temperature and Thermomechanical Coupling in Polymers," Ford Motor Company, Scientific Research Laboratory, Dearborn, MI, October, 1995.
- E. M. Arruda, "Experimental Characterization and Modelling of Orientation-Induced Anisotropy in Polymers," General Motors Corporation, Technology Center, Warren, MI, July, 1995.
- E. M. Arruda, "Experimental Characterization and Internal Variable Based Constitutive Modelling of Amorphous Networks," DOW Chemical, Midland, MI, December, 1993.
- E. M. Arruda, "Experimental Characterization and Constitutive Modelling of the Non-Linear Responses of Polymers at Large Deformations," *G.E. Junior Faculty Fellows Forum*, University of Michigan, November 15, 1993.

Outreach Activities

Seminar: E. M. Arruda, "Mechanical Engineering: One Woman's Perspective," Annual Day, Greenhills High School, Ann Arbor, MI, February 2, 2006.

Chapters in Books

K. Garikipati, E.M. Arruda, K. Grosh, H. Narayanan and S.C. Calve, "Material forces in the context of biotissue remodeling" to appear in **Mechanics of Material Forces**, P. Steinmann and G.A. Maugin, editors, Kluwer Academic Press, 2004.

E. M. Arruda and M. C. Boyce, "*Viscoplasticity of Polymers*" in **HANDBOOK OF MATERIAL BEHAVIOR: Nonlinear Models and Properties**, J. Lemaitre, editor, Academic Press, 2000.

Book Reviews

Mechanical Behavior of Materials by Dowling (Prentice Hall)
Solid Mechanics by Bedford (Addison Wesley)

US and International Patents Awarded

- Ultrastrong and Stiff Layered Polymer Nanocomposites and Hierarchical Laminate Materials Thereof, USPTO patent number 9056951, June 16, 2015.
- System and Method for Forming Bone, Ligament and Bone-Ligament Constructs, USPTO patent number 8,764,828, July 1, 2014.
- System and Method for Forming Skeletal Muscle Constructs Having Functional Tissue Interfaces, USPTO patent number 8,097,455, January 17, 2012.
- System and Method for Forming a Connective Tissue Construct, USPTO patent number 7,422,900, September 9, 2008.
- System and Method for Forming a Cardiac Muscle Construct, USPTO patent number 7,338,798, March 4, 2008.

Patents Submitted

- Bioreactor and Method of Forming Multi-Phasic Tissue Constructs, (provisional 62/193,030) July 15, 2015.
- Blast/Impact Frequency Tuning and Mitigation, (provisional) November 14, 2013.
- Synthesis and Use of Aramid Nanofibers, June 13, 2012.
- Scaffold-Free Three Dimensional Nerve Fibroblast Constructs, (provisional) July 1, 2010.

ENTREPRENEURSHIP

Founder and Chief Scientific Officer of STEL Technologies, LLC, since 2013

SERVICE

Major Committee Assignments at U of M, Dept of ME

Graduate Program Committee, Department of ME, 2015 - present
Graduate Admissions Committee, Department of ME, 2013 – 2015
Faculty Search Committee member, Department of ME, 2008-2009
ME Advisory Committee member, Department of ME, 2005-present
Honors and Awards Committee member, Department of ME, 2003-2005
ME Advisory Committee member, Department of ME, 2002-2003
Graduate Program Committee member, Department of ME, 2001-2002
Faculty Search Committee member, Department of MEAM, 1999-2000
Faculty Search Committee member, Department of MEAM, 1994-1996
Laboratory Committee member, Department of MEAM, 1993-1995
Multimedia Committee member, Department of MEAM, 1994-1996
ME Department Seminar Series co-Coordinator 1996 to 1997

Course Leader, ME 281, 1994 to 1996
Course Leader, ME 396, 1993 to 1996
Course Leader, ME 451, 1993 to 1999
Course Leader, ME 211, 2008 - present

Member, ME PhD committee

- T. Bress, D. R. Dowling advisor, current
- J. Ervin, D. E. Brei advisor, completed
- J. Fonseca, N. Kikuchi advisor, completed
- R. Kolberg, A. S. Wineman advisor, completed
- L. He, M. Hagi advisor, completed

- M. Li, E. Kannatey-Asibu advisor, completed
- D. Malicky, L. Soslosky advisor, completed
- J. Min, A. S. Wineman advisor, completed
- S. Yang, J. Ni advisor, completed
- J. Zhang, N. Kikuchi advisor, completed
- Alan S. Jones, A.S. Wineman and J. Shaw advisors, completed
- Gap-Yong Kim, Jun Ni advisor, completed 2005
- Ho Choi, M. Koc and Jun Ni advisors, completed 2006
- Kristen Mills, M. D. Thouless advisor, completed 2009

Examiner: GCC Exam in Biomechanical Systems, May, 2014

Examiner: GCC Exam in Solid Mechanics, December, 2009

Examiner: GCC Exam in Solid Mechanics, December, 2008

Examiner: PhD Qualifying Exam in Solid Mechanics, January, 2004

Examiner: PhD Qualifying Exam in Materials, January, 2003

Examiner: PhD Qualifying Exam in Materials, September 2001

Examiner: PhD Qualifying Exam in Materials, January 2000

Examiner: PhD Qualifying Exam in Materials, September 1997

Examiner: PhD Qualifying Exam in Materials, September 1996

Examiner: PhD Qualifying Exam in Materials, January 1995

Examiner: PhD Qualifying Exam in Solid Mechanics, January 1994

Examiner: PhD Qualifying Exam in Solid Mechanics, March 1993

College of Engineering

Member, Admissions Committee, Macromolecular Science and Engineering, 2015-present

Member, Executive Committee, 2010-2013

Chair, ME Chair Search Committee, 2006-2007

Member, ChE Faculty Search Committee, 2006-2007

Member, Dean Search Advisory Committee, 2005-2006

Chair, CoE Nominating Committee, 2003-2004

Dean's Advisory Committee on Female Faculty, College of Engineering, 2001-present

Executive Board, Women in Engineering Office, College of Engineering, 1999-2001

Women in Engineering Office Review Committee member, College of Engineering, 1997

College Representative, Department of Aerospace Engineering Faculty Search, 1997

Member, CoE PhD committee

- Yoonseob Kim, N. A. Kotov advisor, 2016
- B. Cardwell, A. F. Yee advisor, completed
- D. Okonski, J. Wilkes advisor, current
- K. Mimura, A. F. Yee advisor, completed
- K. Cox, R. Robertson advisor, current
- Joseph Olberding, K. Garikipati advisor, completed 2010
- Lauren Wood, S. Brooks advisor

- JongDoo Ju, M. Atzmon advisor
- Eugene Kheng, A. Waas advisor
- Jacob Davidson, N. Goulbourne advisor

University of Michigan

Advance Launch Convener, University of Michigan, 2013 – 2014

Rackham Advisory Board, University of Michigan, 2013 – present

MICHR User Advisory Board, University of Michigan, 2010

Rackham Predoctoral Fellowship Review Committee, Rackham Graduate School, University of Michigan, 2010-2011

Provost's Advisory Committee on Mentoring and Faculty Development, University of Michigan, 2002-2005

Macromolecular Science and Engineering Program Review Committee, University of Michigan, 2000

Symposium Co-Organizer, 20th Annual Symposium, The Macromolecular Science and Engineering Center, The University of Michigan, Ann Arbor, MI, October 24 and 25, 1996

Symposium Co-Organizer, 17th Annual Symposium, Current Contributions in Polymer Science and Engineering, The Macromolecular Science and Engineering Center, The University of Michigan, Ann Arbor, MI, October 28 and 29, 1993

Examiner: Macro PhD Qualifying Exam in Mechanical Properties, January 1996

Examiner: Macro PhD Qualifying Exam in Mechanical Properties, January 1995

Examiner: Macro PhD Qualifying Exam in Mechanical Properties, January 1994

Examiner: Macro PhD Qualifying Exam in Mechanical Properties, January 1993

Member UM PhD committee

1. K. Litz, M. Banascak-Holl advisor, completed
2. Jessica Deneweth, S. McLean advisor, completed
3. Jesal Parekh, S. McLean advisor, completed

Administrative Duties at U of M

ME211 Course Leader, ME Department, 2008-present

Advisory Committee, ME Department, 2005-2010

Advisory Committee, ME Department, 2002-2003

Area Coordinator, Materials and Solid Mechanics Faculty, Department of MEAM, 1999

Director, Human Resources Development, Department of MEAM, 1994-1995, 1997-1998

Service to Government or Professional Organizations

Section Editor:

Applied Mechanics Reviews, 2012 - 2015

Associate Editor:

Journal of Applied Mechanics, 2001-2006
Journal of Biomechanical Engineering, 2005-2011

Editorial Board:

Mechanics of Time-Dependent Materials, 2008-2014
Cellular and Molecular Bioengineering, 2008-2015
Molecular and Cellular Biomechanics, 2007-2013

President:

American Academy of Mechanics, 2015-present
Society of Engineering Science, 2004

Vice President:

Society of Engineering Science, 2003

Board Member:

Society of Engineering Science, 1999-2004

Guest Editor:

Journal of Engineering Materials and Technology, July 1997

Conference Organizer:

Big 10 Women's Workshop 2016 – Mentoring and Networking Workshop for Junior Women Faculty in the Big 10, March 22-24, 2016, Milwaukee, WI
Big 10 Women's Workshop 2013 – Mentoring and Networking Workshop for Junior Women Faculty in the Big 10, April 3-5, 2013, Milwaukee, WI
Big 10 Women's Workshop 2010 – Mentoring and Networking Workshop for Junior Women Faculty in the Big 10, April 1-3, 2010, Milwaukee, WI
IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, June 18-21, 2008, Woods Hole, MA
The 40TH Annual Meeting of the Society of Engineering Science, October 12-15, 2003, Ann Arbor, MI

Symposium Co-Organizer:

52nd Annual Meeting of the Society of Engineering Science, “Musculoskeletal Soft Tissue Biomechanics,” October 26-28, 2015, College Station, TX.
52nd Annual Meeting of the Society of Engineering Science, “Symposium in Honor of the 2015 Engineering Science Honoree, Mary C Boyce,” October 26-28, 2015, College Station, TX.

39TH Annual Meeting of the Society of Engineering Science, "Active and Passive Models of Biological Tissue and Functional Engineered Tissue," October 13-16, 2002, State College, PA.

Plasticity '02 The 9th International Symposium On Plasticity and Its Current Applications, "Polymer Mechanics," January 3 - 9, 2002, Palm Beach, Aruba

Plasticity '99 The 7th International Symposium On Plasticity and Its Current Applications, "Polymer Plasticity and Polymer Micromechanics," January 5 - 13, 1999, Cancun, Mexico

The 1997 Joint ASME/ASCE/SES Summer Meeting, "Characterization and Modeling of Polymeric Material Systems," June 29 - July 2, 1997, Northwestern University, Evanston, Illinois

The Society of Engineering Science 33rd Annual Technical Meeting, "Solid Mechanics in Viscoelastic and Plastic Materials," October 20-23, 1996, Arizona State University, Tempe, Arizona

20th Annual Symposium, The Macromolecular Science and Engineering Center, The University of Michigan, Ann Arbor, MI, October 24 and 25, 1996

17th Annual Symposium, Current Contributions in Polymer Science and Engineering, The Macromolecular Science and Engineering Center, The University of Michigan, Ann Arbor, MI, October 28 and 29, 1993

Workshops:

The Cell as a Machine, National Science Foundation Workshop, December 19-21, 2007, Washington, DC

Panel Reviewer:

NSF Division of Civil, Mechanical, and Manufacturing Innovation Review Panel, November 2014

NSF Division of Civil, Mechanical, and Manufacturing Innovation Review Panel, April, 2014

NSF Division of Civil, Mechanical, and Manufacturing Innovation Review Panel, 2013

NSF Division of Civil, Mechanical, and Manufacturing Innovation Review Panel, 2012

NIH Study Section Special Reviewer, 2012

NSF Division of Civil, Mechanical, and Manufacturing Innovation Review Panel, 2011

NSF Division of Civil, Mechanical, and Manufacturing Innovation Review Panel, Proposal Reviewer, January 29, 2008, Washington, DC

NSF Civil and Mechanical Systems Review Panel, Proposal Reviewer, May 16, 2007, Washington, DC

NSF Civil and Mechanical Systems Review Panel, Proposal Reviewer, November 1, 2005, Washington, DC

NSF Nanoscale Modeling and Simulation Initiative, Engineering Education and Centers Division, Proposal Reviewer, June 1-2, 2000, Washington, DC.

NSF Civil and Mechanical Systems Review Panel, Proposal Reviewer, October 28, 1999, Washington, DC

NSF Civil and Mechanical Systems Review Panel, The NSF Institute of Mechanics and Materials, October 16-17, 1995, UCSD, La Jolla, CA

NSF Civil and Mechanical Systems Review Panel, Proposal Reviewer, January 16-17, 1998,
Washington, DC

Conference Abstract Reviewer:

ASME 2010 Summer Bioengineering Meeting, Naples Florida, June 16-19, 2010.

Journal Reviewer:

Acta Biomaterialia
Acta Materialia
Acta Mechanica
European Journal of Mechanics
International Journal of Plasticity
International Journal of Solids and Structures
Journal of Applied Mechanics
Journal of Applied Polymer Science
Journal of Biomechanics
Journal of Composite Materials
Journal of Engineering Materials and Technology
Journal of Experimental Mechanics
Journal of Polymer Science
Journal of Rheology
Journal of the Mechanics and Physics of Solids
Macromolecules
Mathematics and Mechanics of Solids
Mechanics of Time Dependent Materials
Polymer Engineering and Science
Proceedings of the Royal Society
Rubber Chemistry and Technology
Science
Tissue Engineering
ASME

Book Reviewer:

Mechanical Behavior of Materials by Dowling (Prentice Hall)
Solid Mechanics by Bedford (Addison Wesley)

Proposal Reviewer:

Hong Kong Research Grants Council
NASA EPSCoR
NSF Division of Materials Research
American Chemical Society

Visiting Committee:

Member, Massachusetts Institute of Technology, Department of Mechanical Engineering, 2011 – present.

Advisory Board:

Member, Pennsylvania State University, College of Engineering Leonhard Center, 2015-present.
Member, Pennsylvania State University, Department of Engineering Science and Mechanics, 2007 – 2011.

Honors and Awards:

2016 Southwest Mechanics Seminar Series Speaker – Nominated to speak at University of Texas, Austin, Texas A&M University, College Station, and the University of Houston, Houston, February 16-18, 2016

Winner¹, Head Health Challenge III, NFL, NIST, GE, Under Armour, 2015

Outstanding Engineering Alumnus Award, Pennsylvania State University, 2015

Distinguished Faculty Achievement Award, University of Michigan, 2014

Trudy Huebner Service Excellence Award, College of Engineering, University of Michigan, 2014

Ann Arbor Spark Best of Boot Camp Award, 2012

Ted Kennedy Family Team Excellence Award, College of Engineering, University of Michigan, 2012

Excellence in Research Award, American Orthopaedic Society for Sports Medicine, 2012

Fellow, American Academy of Mechanics, 2009

Fellow, American Society of Mechanical Engineers, 2008

Fellow, Society of Engineering Science, 2008

Research Excellence Award, College of Engineering, University of Michigan, 2006-2007

Centennial Fellow, Department of Engineering Science and Mechanics, The Pennsylvania State University, 2006

Outstanding Achievement Award, ME Department, University of Michigan, 2004

NSF CAREER Award, 1997-2002

3M Untenured Faculty Research Award, 1997-2000

Career Development Award, University of Michigan, 1995

Outstanding Teaching Award, MEAM Department, University of Michigan, 1995

General Electric Junior Faculty Fellowship, 1993

B. S. with Honors, The Pennsylvania State University, 1985

Chamberlain Manufacturing Corporation Scholarship, 1981-1985

Member of *Tau Beta Pi* (National Engineering Honor Society)

Consulting

D3O (UK), 2013-2014

Ackervall Technologies, 2012

¹ One of five finalists; overall winner will be chosen in the fall of 2016.

Dow Chemical, 2002-2010
Tissue Genesis, Incorporated, 2004-2008
3M, 1997-2000
First Technology Safety Systems, 1998-2003
Ford Motor Company, 1995-1998
Manta, 2000-2003
Motorola, 1999-2007
Paulstra, 1999-2003
Titleist and FootJoy Worldwide, 1998-2000

Professional Society Memberships

Orthopaedic Research Society
The Society of Engineering Science (past President and Fellow)
The American Academy of Mechanics (2015-present President and Fellow)
The American Society of Mechanical Engineers (Fellow)
The American Association for the Advancement of Science