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Born 10/2/63

Education

Columbia University, Graduate School of Arts and Sciences

Ph.D.	Mechanical Engineering	1991
M.Phil.	Mechanical Engineering	1990

Columbia University, School of Engineering and Applied Science

M.S.	Mechanical Engineering	1987
B.S.	Mechanical Engineering	1986

Experience

2013-	**Andrew Walz Professor of Mechanical Engineering** Columbia University, New York
2011-2014	**Chair, Department of Mechanical Engineering** Columbia University, New York
2002-	**Professor of Mechanical Engineering and Biomedical Engineering** Columbia University, New York
1999-2002	**Vice-Chair, Department of Biomedical Engineering** Columbia University, New York
1999-2002	**Associate Director, Orthopaedic Research Laboratory** Columbia University, New York
1998-2002	**Associate Professor of Biomedical Engineering** Columbia University, New York
1996-	**Director, Musculoskeletal Biomechanics Laboratory** Columbia University, New York
1996-2002	**Associate Professor of Mechanical Engineering** Columbia University, New York
1991-1995	**Assistant Professor of Mechanical Engineering** Columbia University, New York
1991-1999	**Associate in Orthopaedic Research** Columbia University, New York

Honors, Awards and Leadership in Profession

Program Chair, 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and 4th Conference on Imaging and Visualization, 14-16 August 2019, Columbia University, New York City, New York, www.cmbbe2019.com

ASME Journal of Biomechanical Engineering Editor's Choice award for paper titled "A surface-to-surface finite element algorithm for large deformation frictional contact in FEBio," by Brandon K. Zimmerman and Gerard A. Ateshian, 140(8):081013, 2018.

Member of World Council of Biomechanics (2018-2030)

H.R. Lissner Medal, ASME, 2017

First place award in PhD Student Paper Competition for advisee Brandon K. Zimmerman, ASME Bioengineering Division, 2017 Summer Bioengineering Conference

Chair of the U.S. National Committee on Biomechanics, 2016-

Benjamin Zweifach Memorial Lectureship Award, 2015, City College of the City University of New York

Vice-Chair of the U.S. National Committee on Biomechanics, 2014-2016

Andrew Walz Professorship in Mechanical Engineering, 2013, Columbia University

OARSI Basic Science Award, 2013, Osteoarthritis Research Society International

Columbia Engineering Alumni Association Distinguished Faculty Teaching Award, 2012

First place award in PhD Student Paper Competition for advisee Sevan R. Oungoulian, ASME Bioengineering Division, 2012 Summer Bioengineering Conference

Secretary of the U.S. National Committee on Biomechanics, 2011-2013

Fellow of the Biomedical Engineering Society, 2010

Executive Committee Member, Biomedical Engineering Society, 2008-2010

Fellow of the American Society of Mechanical Engineers, 2006

Chair of Bioengineering Division of the American Society of Mechanical Engineers, 2006-2007

Elected Member of Board of Directors, Biomedical Engineering Society, 2005-2008

First place award in PhD Student Paper Competition for advisee Nadeen O. Chahine, ASME Bioengineering Division, 2004 International Mechanical Engineering Congress and Exhibition.

Best Paper Award: Morrison III, B., Cater, H.L., Wang, C.C-B., Thomas, F.C., Hung, C.T., Ateshian, G.A., and Sundstrom, L.E. (2003) A tissue level tolerance criterion for living brain developed with an in vitro model of traumatic mechanical loading. Stapp Car Crash Journal, 47:1-13.

Fellow of the American Institute for Medical and Biological Engineering, 2003

Great Teacher Award, Society of Columbia Graduates, 2002

First place award in PhD Student Paper Competition for advisee Ramaswamy Krishnan, ASME Bioengineering Division, 2002 International Mechanical Engineering Congress and Exhibition.

Executive Committee Member, ASME Bioengineering Division, 2001-2008.

USNCB Delegate to the Fifth Japan-USA-Singapore-China meeting, Sendai, Japan, August 9-13, 1998.

YC Fung Young Investigator Award, ASME, 1997.

First place award in PhD Student Paper Competition for advisee S. Daniel Kwak, ASME Bioengineering Division, 1996 International Mechanical Engineering Congress and Exhibition.

First Independent Research Support and Transition Award (FIRST), National Institutes of Health, 1995-2000.

USNCB Delegate to the Fourth China-Japan-USA-Singapore meeting, Taiyuan, China, May 21-27, 1995.

Frank E. Stinchfield Fellowship in Orthopaedic Bioengineering, Department of Orthopaedic Surgery, Columbia University, 1987-1991.

Fellowship Award, Department of Mechanical Engineering, Columbia University, 1986-1987.

William A. Hadley Award in Mechanical Engineering, Columbia University, 1986.

Tau Beta Pi, Engineering Honor Society.

President, Pi Tau Sigma, Mechanical Engineering Honor Society, Columbia University Chapter, 1985-1986.

Sigma Xi, Honor Society.

Editorial Activities

Editorial Review Board, Journal of Orthopaedic Research, 2014-

Editorial Board Member, Computer Methods in Biomechanics and Biomedical Engineering, Taylor & Francis, 2014-

Editorial Board Member, Journal of Osteoarthritis and Cartilage, Elsevier, 2008-

Guest Editor, Biomechanics and Modeling in Mechanobiology, Special Issues on Cartilage I & II, Vol. 5(2-3), 2006; Vol. 6(1-2), 2007

Associate Editor, Journal of Osteoarthritis and Cartilage, 2006-2008

Survey Editor, Journal of Biomechanics, 2004-2009

Editorial Board Member, Journal of Biomechanics and Modeling in Mechanobiology, Springer, 2001-

Associate Editor, ASME Journal of Biomechanical Engineering, 2000-2006

Editorial Consultant, Journal of Biomechanics, 1999-2004

Editorial Advisory Board Member, Journal of Biomechanics, 2009-

Professional Societies

American Society of Mechanical Engineers

Orthopaedic Research Society

American Association for the Advancement of Science

Biomedical Engineering Society

Osteoarthritis Research Society International

U.S. National Committee on Biomechanics

Professional Activities

Session co-chair, Methodology for Joint Mechanics, Second World Congress of Biomechanics, Amsterdam, The Netherlands, July 1994.

Reviewer and Judge, Student Paper Competition, Bioengineering Division of the American Society of Mechanical Engineers, Winter Annual Meeting (IMECE), Chicago, November 1994.

Session co-chair, The Elbow: Advances in Biomechanics and Surgical Techniques, Cologne, Germany, March 2-5, 1995.

Session chair, Computational Bioengineering: Solid Modeling and Mesh Generation, ASME/AIChE/ASCE Summer Bioengineering Conference, June 29, 1995.

Session chair, Tissue Mechanics: Cartilage Mechanics, ASME/AIChE/ASCE Summer Bioengineering Conference, June 29, 1995.

Session co-chair, Cartilage Mechanics, BMES Conference, Boston, October 6, 1995.

Reviewer/Judge, Student Paper Competition, Bioengineering Division of the American Society of Mechanical Engineers, Winter Annual Meeting (IMECE), San Francisco, November 1995.

Session chair, Upper Extremity Biomechanics, ASME Winter Annual Meeting (IMECE), San Francisco, November 13, 1995.

Session co-chair, Cartilage, 1996 ASME Mechanics & Materials Conference, Baltimore, June 12-14, 1996.

Symposium Organizer and Session Chair, Computer-Aided Surgery and Planning, ASME International Mechanical Engineering Congress and Exposition (IMECE), Atlanta, November 17-22, 1996.

Symposium Co-Organizer and Session Chair, Contact and Interface Mechanics, Solid Mechanics Committee, ASME International Mechanical Engineering Congress and Exposition (IMECE), Atlanta, November 17-22, 1996.

Reviewer, Student Paper Competition, Bioengineering Division of the American Society of Mechanical Engineers, Winter Annual Meeting (IMECE), Atlanta, November 17-22, 1996.

ASME 1997 Bioengineering Conference co-organizer, Solid Mechanics Committee, Sunriver, Oregon, June 11-15, 1997.

Chairman, ASME Bioengineering Division Membership Development Committee, June 1997-May 2000.

Symposium Co-Organizer and Session Co-Chair, Contact and Interface Mechanics, ASME 1997 Bioengineering Conference, Sunriver, Oregon, June 11-15, 1997.

Session Organizer and Co-Chair, Computer Assisted Modeling and Imaging, ASME 1997 International Mechanical Engineering Congress and Exposition, Dallas, Texas, November 16-21, 1997.

Attendee, National Institutes of Health Bioengineering Consortium (BECON) meeting, Bethesda, Maryland, February 27-28, 1998.

Bioengineering Division Delegate to ASME Technology Executives Conference, Houston, Texas, March 6-8, 1999.

Session Organizer and Chair, Fiber-Reinforced Models for Soft Tissues, ASME 1998 International Mechanical Engineering Congress and Exposition, Anaheim, California, November 15-20, 1998.

Information Chair and co-organizer, 1999 Summer Bioengineering Conference, ASME, Big Sky, Montana, June 16-20, 1999.

Judge, Student Paper Competition; Session Organizer and Co-Chair, Soft Tissue Mechanics I, II, III, Bioengineering Division of the American Society of Mechanical Engineers, Winter Annual Meeting (IMECE), Nashville, Tennessee, November 14-19, 1999.

Ad Hoc Reviewer and Session Moderator, Cartilage Mechanics I, 46th Annual Meeting of the Orthopaedic Research Society, Orlando, Florida, March 13, 2000.

Y.C. Fung Young Investigator Award Committee Member, ASME Bioengineering Division, 2000-2006.

Student Paper Competition Committee Member (BS-level 2000, MS-level 2001, PhD-level 2002, Committee Chair 2003), ASME Bioengineering Division, 2000-2003.

Judge, MS and PhD Student Paper Competitions; Bioengineering Division of the American Society of Mechanical Engineers, Winter Annual Meeting (IMECE), Orlando, Florida, November 8-10, 2001.

Information Chair and co-organizer, 2001 Summer Bioengineering Conference, ASME, Snowbird, Utah, June 26-July 1, 2001.

Chair, Finance Committee of the Bioengineering Division of ASME (June 1, 2001-2004).

Session Chair, Soft Tissue Mechanics II, BMES 2001 Annual Fall Meeting, Durham, North Carolina, October 7, 2001.

Treasurer, ASME Bioengineering Division (2002-2005).

Track co-Chair, Orthopaedics and Rehabilitation, BMES 2003 Annual Fall Meeting, Nashville, Tennessee.

Finance Chair and co-organizer, 2003 Summer Bioengineering Conference, ASME, Key Biscayne, Florida, June 25-29, 2003.

Track Chair, Orthopaedics and Rehabilitation, BMES 2004 Annual Fall Meeting, Philadelphia, Pennsylvania.

Cartilage Mechanics Symposium Organizer, 2004 European Society of Biomechanics Conference, 's-Hertogenbosch, The Netherlands, July 4-7, 2004.

Orthopaedic Track Organizer, 2004 Biomedical Engineering Society Conference, Philadelphia, Pennsylvania, October 13-16, 2004.

Secretary, ASME Bioengineering Division, 2005-2006.

Member of BMES Board of Directors, 2005-2008.

Chair, ASME Bioengineering Division, 2006-2007.

Member of BMES Executive Committee and Chair of Finance Committee, 2008-2010

Chair, New Directions Committee, ASME Bioengineering Division, 2009-2012

Topic Chair, Cartilage-Meniscus-Synovium, 2009 and 2010 Annual Meetings of the Orthopaedic Research Society

Moderator, Cartilage Surface Structure & Lubrication, 55th Annual Meeting of the Orthopaedic Research Society, Las Vegas, February 22-25, 2009.

Secretary, U.S. National Committee on Biomechanics, 2011-2013

Conference co-Chair, 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Salt Lake City, Utah, April 3-6, 2013.

Session co-Chair, Soft Tissue Mechanics, 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Salt Lake City, Utah, April 3, 2013.

Workshop Chair and Speaker, FEBio Workshop #2 - Multiphasic Materials, 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Salt Lake City, Utah, April 6, 2013.

Session co-Chair, Growth, Remodeling and Adaptation of Biological Tissues, 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Salt Lake City, Utah, April 6, 2013.

Vice-Chair, U.S. National Committee on Biomechanics, 2014-

Organizer of Workshop on Open Source Computational Mechanics Tools for Orthopaedics, 2014 Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana, March 15, 2014.

Member of the ASME Savio L-Y. Woo Translational Biomechanics Medal Committee (2015-2017).

Member of the ASME Journal of Biomechanical Engineering Richard Skalak Best Paper Award Committee (2016-2017)

Invited Lectures

1. Anatomy and congruence of the thumb carpometacarpal joint. Invited lecture, Upper Extremity Workshop, Orthopaedic Research Society, Washington DC, February 1992.
2. Stereophotogrammetric determination of diarthrodial joint articular surfaces. Seminar Lecture, Department of Mechanical Engineering, University of Maryland, Baltimore County, March 1992.
3. Quantitative anatomy and contact areas in diarthrodial joints. Grand Rounds Lecture, Department of Orthopaedic Surgery, The State University of New York at Stony Brook, March 1994.
4. Quantitative anatomy of articular surfaces of diarthrodial joints. Invited speaker, Department of Anatomy, Ludwig-Maximiliens Universitat, Munich, Germany, July 1994.
5. A theoretical model for boundary friction in articular cartilage. Invited keynote speaker, Orthopaedic Engineering Session, Biomedical Engineering Society, Tempe, October 1994.
6. Rolling and sliding contact of cylindrical biphasic articular surfaces using integral transform methods. Invited speaker, High Performance Supercomputing in Bioengineering Workshop, Pittsburgh Supercomputer Center, Pittsburgh, October 1994.
7. Experimental and theoretical contact mechanics in diarthrodial joints. Instructional course, The Elbow: Advances in Biomechanics and Surgical Techniques, Cologne, Germany, March 2-5 1995.
8. Computer-Aided Design at Columbia University. Invited speaker, Jiao-Tong University, Shanghai, China, June 6, 1995.
9. Quantitative anatomy and contact in diarthrodial joints. Grand Rounds Lecture, Department of Surgery, Division of Orthopaedics, University of Michigan, Ann Arbor, MI, June 15, 1995.
10. Experimental and theoretical analyses of knee mechanics. Seminar lecture, Orthopaedic Research Laboratories, University of Michigan, Ann Arbor, MI, June 15, 1995.
11. Contact and lubrication of diarthrodial joints: The role of interstitial fluid pressurization. Seminar lecture, Department of Mechanical Engineering, University of Maryland, Baltimore County, MD, October 27, 1995.
12. Contact mechanics of natural joints. Invited speaker, Contact Mechanics Workshop, 1997 Orthopaedic Research Society Conference, San Francisco, February 10, 1997.
13. Recent advances in cartilage lubrication. Seminar lecture, Center for Biomedical Engineering, The City College of New York, NY, April 28, 1997.

14. Modeling of cartilage friction by the theory of mixtures. Invited speaker, Department of Mechanical Engineering, The University of Leeds, United Kingdom, September 11, 1997.
15. Biotribology of natural joints. Invited speaker, Biotribology Workshop, 1998 Orthopaedic Research Society Conference, New Orleans, March 17, 1998.
16. A mixture approach to the study of cartilage tribology. Invited speaker, 1998 US National Committee on Applied Mechanics Conference, Gainsville, Florida, June 22, 1998.
17. Contact mechanics and lubrication of diarthrodial joints. Invited lecturer, Hospital for Special Surgery, New York, New York, July 9, 1998.
18. Understanding cartilage biotribology using the theory of mixtures. Invited speaker, 1998 ASME/STLE International Tribology Conference, Toronto, Ontario, Canada, October 25, 1998.
19. In vivo biomechanical analysis of osteoarthritic patellofemoral joints using 3d multi-body models from patient MRI. Biomechanics Symposium Honoring Dr. YC Fung's 80th Birthday, ASME 1999 Summer Bioengineering Conference, Big Sky, Montana, June 19, 1999.
20. Boundary friction of articular cartilage using a binary solid-fluid mixture model with a bimodular matrix. Invited Keynote Speaker, International Conference on Multifield Problems, Stuttgard, Germany, October 6, 1999.
21. Biomechanics and cartilage healing. Invited Speaker, Knee Course, 1999 GNYRC-ACSM Annual Conference, American College of Sports Medicine, New York City, New York, November 20, 1999.
22. Surface curvatures of the tarsometatarsal joint. Grand Rounds Lecture, New York College of Podiatric Medicine, New York, NY, March 28, 2000.
23. Functional Properties of Natural and Tissue Engineered Articular Cartilage. Functional Tissue Engineering Workshop, Tampa, Florida, September 15, 2000.
24. Functional Properties of Natural Articular Cartilage. Seminar presentation, University of Illinois at Urbana-Champaign, Department of Mechanical and Industrial Engineering, April 17, 2001.
25. Considerations for Tissue Engineering of Anatomically Shaped Cartilage Constructs. Seminar presentation, University of California at San Francisco, San Francisco, CA, August 24, 2001.
26. Patellofemoral Joint Biomechanics And Tissue Engineering. Patellofemoral Arthroplasty Summit Conference, Chantillly, Virginia, November 2nd, 2002.
27. Cartilage Mechanics and Tissue Engineering. Biocomplexity Workshop III, University of Notre Dame, South Bend, Indiana, November 9th, 2002.
28. The Role Of Dynamic Loading In Cartilage Functional Tissue Engineering. Tissue Engineering Biotechnology Conference, Cold Spring Harbor, New York, November 23rd, 2002.
29. Cartilage Mechanics and Tissue Engineering. Department of Biomedical Engineering, State University of New York at Stony Brook, New York, March 19th, 2003.
30. Cartilage Mechanics and Tissue Engineering. Department of Biomedical Engineering, Rensselaer Polytechnic Institute, Rensselaer, New York, April 2nd, 2003.
31. Cartilage Mechanics and Tissue Engineering. Department of Mechanical Engineering, Drexel University, Philadelphia, Pennsylvania, April 25th, 2003.

32. Mapping of Articular Cartilage Topography and Thickness in Normal and Osteoarthritic Joints, Hôpital Notre-Dame, Montréal, Québec, June 6th, 2003.
33. Mechanics and Transport in Cartilage Tissue Engineering, 30th Anniversary of the Leeds Annual Day Conference, Leeds, United Kingdom, January 7th, 2005.
34. Cartilage Mechanics and Tissue Engineering, University of Utah, Department of Bioengineering, Salt Lake City, Utah, January 13, 2006
35. Cartilage Lubrication and Tissue Engineering, Georgia Institute of Technology, Atlanta, Georgia, February 9, 2006.
36. Interstitial Fluid Pressurization and the Role of Chondroitin Sulfate in the Frictional Response of Articular Cartilage, Cartilage Lubrication Workshop, 52nd Annual Meeting of the Orthopaedic Research Society, Chicago, Illinois, March 19, 2006.
37. Application of Mixture Theory to Cartilage Mechanics and Tissue Engineering, City College of the City University of New York, Department of Biomedical Engineering, New York, New York, September 27, 2006.
38. Patellofemoral Joint Biomechanics and Tissue Engineering, Duke University, Orthopaedic Grand Rounds, Durham, North Carolina, October 4, 2006.
39. Application of Mixture Theory to Cartilage Mechanics and Tissue Engineering, Duke University, Department of Biomedical Engineering, Durham, North Carolina, October 4, 2006.
40. Application of Mixture Theory to Cartilage Mechanics and Tissue Engineering, University of Minnesota, Department of Biomedical Engineering, Minneapolis, Minnesota, November 1, 2006.
41. Application of Mixture Theory to Cartilage Mechanics and Tissue Engineering, University of Michigan, Department of Mechanical Engineering, Ann Arbor, Michigan, February 2, 2007.
42. Application of Mixture Theory to Cartilage Mechanics and Tissue Engineering, Rutgers University, Department of Biomedical Engineering, New Brunswick, New Jersey, March 26, 2007.
43. Computational Modeling of Biological Tissues Using Mixture Theory: Positing New Hypotheses and Testing Them Experimentally, Keynote presentation at Eighth Annual Biomedical Computation at Stanford Symposium (BCATS), Stanford University, Stanford, California, October 27, 2007.
44. Modeling Cell Mechanics with Continuum Theories, Mechanics and Computation Seminar Series, Stanford University, Stanford, California, February 7, 2008.
45. Lectures on Mixture Theory for Biological Tissues. Summer School on Modeling and Computation in Biomechanics, Graz University of Technology, Austria, September 15-19, 2008. Coordinated by Gerhard A Holzapfel and Ray W Ogden.
46. Modeling Biological Tissue Growth by Cell Division and Multigenerational Interstitial Growth of Extracellular Matrix, IAMCS/KAUST Symposium on Modeling Biological Materials, Texas A&M University, College Station, Texas, January 28, 2010.
47. Functional Tissue Engineering of Cartilage: Theory and Experiments, Clinical and Translational Science Award (CTSA) Seminar Series, Columbia University Medical Center, New York, April 5, 2010.
48. Cartilage Biomechanics and Transport: Theory and Experiments, McKay Orthopaedic Research Laboratories Seminar Series, University of Pennsylvania, Philadelphia, Pennsylvania, April 13, 2010.

49. Cartilage Mechanics and Lubrication, Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, Columbia University, New York, New York, May 13, 2010.
50. Cartilage Mechanics and Lubrication, Hand Surgery service, St. Luke's-Roosevelt Hospital, New York, New York, February 8, 2011.
51. Enhancing Transport in Immature Cartilage and Engineered Tissue Constructs, Bioengineering Seminar Series, Institute for Bioengineering and Bioscience, Georgia Institute of Technology, Atlanta, Georgia, March 8, 2011
52. Cartilage Mechanics and Lubrication, Orthopedics Grand Rounds, Department of Orthopedic Surgery, Mayo Clinic, Rochester, Minnesota, March 14, 2011.
53. Tissue Engineering of Cartilage: Theory and Experiments, Musculoskeletal Research Conference, Mayo Clinic, Rochester, Minnesota, March 14, 2011.
54. Cartilage Mechanics and Lubrication, J.L. Nowinski Lecture, University of Delaware, Department of Mechanical Engineering, September 23, 2011.
55. Solute Transport and Growth Factor Activation in Cartilage and Synovial Fluid, Mt. Sinai Hospital, Department of Orthopaedic Surgery, New York, October 26, 2012.
56. Cartilage Mechanics and Lubrication, Seminar Presentation, Department of Mechanical Engineering, Vanderbilt University, Nashville, Tennessee, September 10, 2012.
57. Mixture Framework for Modeling Mechanics, Transport, and Growth in Biological Tissues and Cells, Plenary Lecture, 22nd International Workshop on Computational Mechanics of Materials, Baltimore, Maryland, September 26, 2012.
58. Mixture Framework for Modeling Mechanics, Transport, and Growth in Biological Tissues and Cells, Seminar Presentation, Department of Aerospace and Mechanical Engineering, Notre Dame University, South Bend, Indiana, November 27, 2012.
59. Cartilage Mechanics and Lubrication, Basic Science Research Award Presentation, 2013 Osteoarthritis Research Society International World Congress, Philadelphia, Pennsylvania, April 18, 2013.
60. Modeling Tissue Engineering in FEBio, Workshop: Open Source Computational Mechanics Tools for Orthopaedics, 2014 Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana, March 15, 2014.
61. Optimization of Culture Conditions for Large Cartilage Tissue Constructs Using Computational Modeling of Nutrient Consumption, Matrix Deposition and Growth, Keynote Lecture, 2014 World Congress of Biomechanics, Boston, Massachusetts, July 9, 2014.
62. Finite Element Modeling of Mechanics, Transport, and Chemical Reactions in Biological Tissues and Cells, Keynote Lecture, 2014 World Congress of Biomechanics, Boston, Massachusetts, July 10, 2014.
63. Experimentally Validated Computational Simulations for Identifying and Optimizing Nutrient Supply for Engineering Large Cartilage Tissue Constructs, Invited Speaker, 2015 CMBE Conference, St. Thomas, US Virgin Islands, January 8, 2015.
64. Theoretical And Computational Approaches For Modeling Engineered Cartilage Growth And Optimizing Culture Conditions, Seminar Presentation, Coulter Department of Biomedical Engineering and The Petit Institute for Bioengineering and Bioscience, Georgia Institute of Technology, Atlanta, Georgia, April 7, 2015.
65. Tissue Mechanics, Invited Keynote Speaker, International Society of Biomechanics, Glasgow, United Kingdom, July 15, 2015.

66. Cartilage Mechanics and Lubrication, Invited Speaker, Soft Matter Symposium, University of Florida, Gainesville, Florida, October 21, 2015.
67. Growth Mechanics, Damage Mechanics and Viscoelasticity Using Reactive Mixtures, Zweifach Memorial Lecture, City College of the City University of New York, New York, New York, November 11, 2015.
68. Growth Mechanics, Damage Mechanics and Viscoelasticity Using Reactive Mixtures, Department of Mechanical Engineering, New York University Tandon School of Engineering, New York, New York, April 18, 2016.
69. The Role of Transport and Activation of TGF-ß in Cartilage Friction and Wear, AAOS/ORS Tackling Joint Disease by Understanding Crosstalk between Cartilage and Bone Research Symposium, Chicago, Illinois, April 30, 2016.
70. Tissue Engineering of Articular Surface-Sized Cartilage Constructs Using Experimental And Computational Optimization, Oxford University, Oxford, United Kingdom, February 21, 2017.
71. Tissue Engineering of Articular Surface-Sized Cartilage Constructs Using Experimental And Computational Optimization, Department of Orthopaedic Surgery, University of Rochester, Rochester, New York, April 11, 2017.
72. Cartilage Tissue Engineering and Damage Mechanics Using Reactive Mixture Theory, Department of Mechanical Engineering, University of Kansas, Lawrence, Kansas, November 20, 2017.
73. Cartilage Tissue Engineering and Damage Mechanics Using Reactive Mixture Theory, Department of Orthopaedic Surgery, Washington University in St. Louis, St. Louis, Missouri, December 1st, 2017.
74. FEBio Overview, Department of Biomedical Engineering, Washington University in St. Louis, St. Louis, Missouri, December 1st, 2017.
75. Cartilage Tissue Engineering and Damage Mechanics Using Reactive Mixture Theory, Department of Orthopaedic Surgery, Thomas Jefferson University, Philadelphia, Pennsylvania, March 26, 2018.
76. Cartilage Repair Using Femtosecond Laser for Crosslinking Collagen, Translational Research Session, 76th Biennial Meeting of the New York Orthopaedic Hospital, Columbia University, May 4, 2018.
77. Cartilage Tissue Engineering and Damage Mechanics Using Reactive Mixture Theory, Suhren lecture, Department of Biomedical Engineering, Tulane University, New Orleans, Louisiana, December 4, 2019.
78. Cartilage Treatment Strategies: Tissue Engineering, Osteochondral Allograft Bending and Laser Crosslinking, keynote lecture, EPSRC Programme Grant in Optimising Knee Therapies Annual Scientific Meeting, University of Leeds, Leeds, United Kingdom, January 8, 2020.

Conference Presentations

79. Stereophotogrammetric determinations of patellar cartilage thickness and surface geometry. ASME Winter Annual Meeting, Chicago, Illinois, December 1988.
80. An in situ method to determine diarthrodial joint contact areas using stereophotogrammetry. ASME Winter Annual Meeting, San Francisco, California, December 1989.

81. A quantitative method to study the biomechanics of the carpometacarpal joint of the thumb. ASME Winter Annual Meeting, Dallas, Texas, November 1990.
82. A model for fluid-film lubrication of diarthrodial joints: The moving load problem. 3rd U.S.-China-Japan Conference on Biomechanics, Atlanta, Georgia, August 1991.
83. A biphasic model for contact in diarthrodial joints. ASME Winter Annual Meeting, Anaheim, November 1992.
84. A stereophotogrammetric method for determining in situ contact areas in diarthrodial joints: A comparison study. ASME Winter Annual Meeting, Anaheim, November 1992.
85. Biphasic finite deformation properties of bovine articular cartilage. Second World Congress of Biomechanics, Amsterdam, The Netherlands, July 1994.
86. Theoretical analysis of the moving contact of biphasic cartilage layers. ASME International Mechanical Engineering Congress and Exposition, Chicago, November 1994.
87. A theoretical model for boundary friction in articular cartilage. Fourth China-Japan-USA-Singapore meeting, Taiyuen, China, May 23, 1995.
88. A new experimental technique for measuring the time-dependent and congruence-dependent creep and contact radius in a diarthrodial joint contact model. ASME/AIChe/ASCE Bioengineering Conference 1995, Beaver Creek, Colorado, June 29, 1995.
89. Continuity requirements across a contact interface in the formulation of a boundary friction model for biphasic articular cartilage. ASME/AIChe/ASCE Bioengineering Conference 1995, Beaver Creek, Colorado, June 29, 1995.
90. Generating trimmed B-spline models of articular cartilage layers from unordered 3D surface data points. ASME/AIChe/ASCE Bioengineering Conference 1995, Beaver Creek, Colorado, June 30, 1995.
91. Contact creep response between a rigid impermeable cylinder and a biphasic cartilage layer using integral transforms. ASME/AIChe/ASCE Bioengineering Conference 1995, Beaver Creek, Colorado, July 1, 1995.
92. The velocity and compressive strain dependence of the cartilage equilibrium friction coefficient. ASME International Mechanical Engineering Congress and Exposition, November 13, 1995.
93. Determination of in situ contact areas in diarthrodial joints by MRI. ASME International Mechanical Engineering Congress and Exposition, November 14, 1995.
94. The normal stress effect in articular cartilage under steady frictional shear. 1996 ASME Mechanics & Materials Conference, Baltimore, June 12, 1996.
95. Rolling resistance of articular cartilage due to interstitial fluid flow. 1996 ASME International Mechanical Engineering Congress and Exposition, Atlanta, November 22, 1996.
96. The role of proteoglycans in the frictional properties and normal stress effect of articular cartilage. 1996 ASME International Mechanical Engineering Congress and Exposition, Atlanta, November 22, 1996.
97. Interstitial fluid pressurization regulates the frictional response of cartilage. 1997 Orthopaedic Research Society Conference, San Francisco, February 10, 1997.
98. Tibiofemoral and patellofemoral kinematics and contact: Effects of hamstrings and iliotibial band force. 1997 ASME Summer Bioengineering Conference, Sunriver, June 12, 1997.

99. Knee joint topography and contact areas: Validation of measurements from MRI. 1997 ASME Summer Bioengineering Conference, Sunriver, June 12, 1997.
100. The role of interstitial fluid pressurization and surface porosities on the boundary friction of articular cartilage. 1997 ASME Summer Bioengineering Conference, Sunriver, June 12, 1997.
101. The role of interstitial fluid pressurization and equilibrium friction coefficient on the boundary friction of articular cartilage. First World Congress of Tribology, London, United Kingdom, September 10, 1997.
102. A mathematical model of the thumb carpometacarpal joint. ASME 1997 International Mechanical Engineering Congress and Exposition, Dallas, Texas, November 18, 1997.
103. Boundary conditions at the sliding interface of contacting biphasic cartilage media with viscous interstitial fluid phase. Third World Congress of Biomechanics, Sapporo, Japan, August 4, 1998.
104. Planning of diarthrodial joint surgery using quantitative magnetic resonance imaging data. Third World Congress of Biomechanics, Sapporo, Japan, August 5, 1998.
105. Computer-aided planning of patellofemoral joint OA surgery: Developing physical models from patient MRI. First International Conference on Medical Image Computing and Computer-Assisted Intervention, Boston, Massachussetts, October 11, 1998.
106. Ionic polarization in charged hydrated soft tissues. 1998 ASME International Mechanical Engineering Congress and Exposition, Anaheim, California, November 20, 1998.
107. Conewise linear elasticity mixture model for the analysis of tension-compression nonlinearity in articular cartilage. 45th Annual Meeting of the Orthopaedic Research Society, Anaheim, California, February 2nd, 1999.
108. Does osmotic pressure influence the frictional response of articular cartilage? ASME 1999 Summer Bioengineering Conference, Big Sky, Montana, June 17, 1999.
109. A biphasic conewise linear elasticity model for modeling tension-compression nonlinearity in articular cartilage. ASME 1999 Summer Bioengineering Conference, Big Sky, Montana, June 17, 1999.
110. Tensile and compressive stiffness of human glenohumeral cartilage under finite deformation. ASME 1999 Summer Bioengineering Conference, Big Sky, Montana, June 19, 1999.
111. Contact areas and kinematics of thumb carpometacarpal joint in functional pinch and grasp. ASME 1999 Summer Bioengineering Conference, Big Sky, Montana, June 19, 1999.
112. The influence of cartilage thickness in the multibody modeling of patellofemoral joint kinematics and contact stresses. ASME 1999 International Mechanical Engineering Congress and Exposition, Nashville, Tennessee, November 15, 1999.
113. Finite element contact analysis of a cartilage layer exhibiting tension-compression nonlinearity. ASME 1999 International Mechanical Engineering Congress and Exposition, Nashville, Tennessee, November 16, 1999.
114. Permeability of human glenohumeral joint cartilage. ASME 1999 International Mechanical Engineering Congress and Exposition, Nashville, Tennessee, November 16, 1999.
115. Comparison of equilibrium axial strain distribution in articular cartilage explants and cell-seeded alginate disks under unconfined compression. 46th Annual Meeting of the Orthopaedic Research Society, Orlando, Florida, March 13, 2000.

116. Surface topography and cartilage thickness templates for the femur and patella based on an average of healthy articular surfaces. ASME 2000 International Mechanical Engineering Congress and Exposition, Orlando, Florida, November 9, 2000.
117. Hydrostatic pressurization and depletion of trapped lubricant pool during creep and sliding of a rippled indenter against a biphasic articular cartilage layer. ASME 2000 International Mechanical Engineering Congress and Exposition, Orlando, Florida, November 10, 2000.
118. Experimental verification of the role of intrinsic matrix viscoelasticity and tension-compression nonlinearity in the biphasic response of cartilage in unconfined compression. 2001 Summer Bioengineering Conference, Snowbird, Utah, June 30, 2001.
119. Joint-specific articular surface molds for the production of anatomically shaped tissue-engineered cartilage constructs. BMES 2001 Annual Fall Meeting, Durham, North Carolina, October 6, 2001.
120. The strain-softening of bovine articular cartilage under infinitesimal deformation in unconfined compression. BMES 2001 Annual Fall Meeting, Durham, North Carolina, October 7, 2001.
121. Determination of poisson's ratios of bovine articular cartilage in tension and compression using osmotic and mechanical loading. ASME 2002 International Mechanical Engineering Congress and Exposition, New Orleans, Louisiana, November 21, 2002.
122. Flow-independent viscoelastic response of bovine articular cartilage under dynamic tensile loading. ASME 2004 International Mechanical Engineering Congress and Exposition, Anaheim, California, November 18, 2004.
123. Finite element analysis of strain fields in chondrocytes and the extracellular matrix of cartilage under physiological loading, European Cell and Materials, ECM VII Cartilage and Joint Repair, Davos, Switzerland, June 27, 2006.
124. Mixture theory analysis of interstitial growth of proteoglycans as a mechanism regulating residual stresses in biological tissues, in session Biomechanics of Growth and Remodeling I, presented at the 44th Annual Technical Meeting of the Society of Engineering Science, Texas A&M University, College Station, TX, October 23, 2007.
125. Functional tissue engineering of anatomically shaped cartilage constructs, in session Tissue Engineering in 3D: Rebuilding the Musculoskeletal Tissues, invited presentation, American Association of Anatomists, presented at 2008 Experimental Biology meeting, San Diego, CA, April 7, 2008.
126. Functional tissue engineering of anatomically-shaped cartilage tissue constructs. Invited speaker, 2008 Osteoarthritis Research Society International World Congress, Rome, Italy, September 19, 2008.
127. Modeling cartilage with a continuous fiber angular distribution predicts many observed phenomena. 2008 Annual Meeting of the Biomedical Engineering Society, St. Louis, MO, October 2, 2008.
128. Multigenerational interstitial growth of biological tissues. 2010 ASME Summer Bioengineering Conference, Naples, FL, June 16, 2010.
129. Finite element algorithm for frictionless contact of porous permeable media under finite deformation and sliding. 2010 ASME Summer Bioengineering Conference, Naples, FL, June 17, 2010.
130. FEBio: Finite elements for biomechanics (workshop). 2010 ASME Summer Bioengineering Conference, Naples, FL, June 19, 2010.

131. Negative growth by surface and volume dissolution. 16th U.S. National Congress of Theoretical and Applied Mechanics. PennState, State College, PA, July 2, 2010.
132. Finite element implementation of neutral solute transport in porous biological tissues under finite deformation. 2011 ASME Summer Bioengineering Conference, Farmington, PA, June 23, 2011.
133. Implementation of Finite Deformation Triphasic Modeling in the Finite Element Code FEBio. 2012 ASME Summer Bioengineering Conference, Fajardo, Puerto Rico, June 22, 2012.
134. Mixture framework for modeling mechanics, transport, and growth in biological tissues and cells. Plenary lecture, 22nd International Workshop on Computational Mechanics of Materials, Baltimore, MD, September 26, 2012.
135. A Gauss-Kronrod-trapezoidal integration scheme for modeling biological tissues with continuous fiber distributions. 2014 Computer Methods in Biomechanics and Biomedical Engineering Conference, Amsterdam, The Netherlands, October 15, 2014.
136. FEBio: Finite elements for biomechanics (workshop). International Society of Biomechanics, Glasgow, United Kingdom, July 15, 2015.
137. Biphasic analysis of cartilage stresses in the patellofemoral joint. 2015 Computer Methods in Biomechanics and Biomedical Engineering Conference, Montreal, Canada, September 2, 2015.
138. How-To Session: FEBio Workshop – New features. 2017 Summer Biomechanics, Bioengineering, and Biotransport Conference, Tucson, Arizona, June 21, 2017.
139. H.R. Lissner Medal Award Lecture: A Perspective on the role of modeling in biomechanics. 2017 Summer Biomechanics, Bioengineering, and Biotransport Conference, Tucson, Arizona, June 24, 2017.
140. Keynote Presentation: Cartilage Tissue Engineering Versus Osteochondral Allografts: Challenges and Strategies for Viable Long-Term Solutions, Functional tissue engineering of articular cartilage and fibrocartilage session. 8th World Congress of Biomechanics, Dublin, Ireland, July 6, 2018.
141. FEBio Workshop. 8th World Congress of Biomechanics, Dublin, Ireland, July 8, 2018.
142. Keynote Presentation: Fatigue damage mechanics in articular cartilage via tissue remodeling: a reactive constrained mixture approach. 55th Annual Technical Meeting of the Society of Engineering Science, Madrid, Spain, October 12, 2018.
143. Plenary Talk: Modeling fatigue failure in soft biological tissues using reactive constrained mixtures. Fourth Soft Tissue Modeling Workshop, University of Glasgow, Glasgow, Scotland, United Kingdom, June 5, 2019.
144. Keynote Presentation: A Foundational Reactive Mixture Theory Framework For Computational Biomechanics. 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering. New York, NY, August 16, 2019.

Current Funding

1. The National Institutes of Health, R01 GM083925, "FEBio - Finite Elements for Biomechanics and Biophysics," Co-Principal Investigators: Gerard A. Ateshian and Jeffrey A. Weiss (University of Utah) $1,664,975 (TC), $614,116 (TC to GAA), 09/1/16-08/31/20.

2. National Institutes of Health, R01 AR068133, "Incorporation of Dexamethasone Delivery within Engineered Cartilage," Co-Investigator (PI: C.T. Hung), $2,558,709 (TC), 05/16/2016-04/30/2021.
3. National Institutes of Health, R01 HL135734, "Carotid Plaque Assessment Using Pulse Wave Imaging," Co-Investigator (PI: E.E. Konofagou), $3,182,945 (TC), 01/05/2017-04/30/2021.
4. Department of Defense, PRMRP W81XWH1810361, PR171360, "Adaptively Conforming Osteochondral Allografts for Joint Replacements," Principal Investigator, $1,522,610 (TC), 09/01/2018-08/31/2021.
5. National Institutes of Health, R01 AR073289, "Laser Treatment Modality for Strengthening Osteoarthritic Cartilage," Co-Principal Investigators: Gerard A. Ateshian, Sinisa Vukelic, $704,552 (DC), $1,090,622 (TC), 01/01/2019-12/31/2022.
6. National Institutes of Health, 1U24EB029007-01, "Lab-To-User Training And Dissemination For The FEBio Software Suite," Subcontract Principal Investigator, $1,775,065 (TC), $250,000 (TC to GAA), 09/30/2019-06/30/2024.
7. Department of Defense, W81XWH-19-PRMRP-IIRA, "Sustained Dexamethasone Delivery to Prevent Onset of PTOA," Co-Investigator (PI: C.T. Hung), $1,571,838 (TC), 09/01/2020-08/31/2023.

Previous Funding

1. The Whitaker Foundation, "Contact Mechanics and Lubrication of Diarthrodial Joints;" Principal Investigator, $180,000, 8/1/92-7/31/95.
2. The Orthopaedic Research and Education Foundation, "Optimal Tracking of the Patellofemoral Joint and Clinical Implications," Senior Investigator, $150,000, 7/1/93-6/30/95.
3. The National Science Foundation, High Performance Computing and Communications Program, "Understanding Human Joint Mechanics through Advanced Computational Models;" Co-Principal Investigator, ASC-9318184, $421,477 (TC), 9/1/93-8/31/97.
4. The National Institutes of Health, "Etiology of Thumb Carpometacarpal Joint Osteoarthrosis;" Co-Investigator, RO1 AR41020, $967,158 (TC), 4/15/94-4/14/98.
5. The National Science Foundation, "Acquisition of a Rapid Prototyping System," Co-Investigator, CISE-9529346, $61,334 (TC), 12/1/95-11/30/98.
6. The Whitaker Foundation, "Tissue Biomechanics and Biochemistry: A Theme for the Development of a Biomedical Engineering Department at Columbia University;" Special Opportunity Award, Co-Investigator, $995,610 (TC), 1/1/96-12/31/98.
7. New York College of Podiatric Medicine gift fund, "Contours of Articular Surfaces of the Medial Tarsometatarsal Joint in Relation to Metatarsus Primus Adductus," $12,283, 9/1/98-11/30/98.
8. The National Collegiate Inventors and Innovators Alliance (NCIIA), "A Low-Cost, Pneumatic Materials Tester For Biological Tissues and Other Flexible Materials," Co-Principal Investigator, $14,000 (TC), 1/6/98-1/5/99.
9. Zimmer, "Finite Element Analysis of Shoulder Prostheses," Principal Investigator, $7,675 (TC), 8/1/98-31/1/99.
10. The National Institutes of Health, "Biotribology of diarthrodial joints;" Principal Investigator, 1 R29 AR43628, $566,513 (TC), 6/15/95-5/31/00.

11. The National Institutes of Health, "Biomechanical factors in OA of the glenohumeral joint;" Co-Investigator, 1R01 AR42850, $1,488,866 (TC), 3/1/96-2/29/00.
12. Zimmer, "In Vitro Testing of Shoulders and Shoulder Prostheses in Cadavera," Principal Investigator, $98,063 (TC), 8/1/98-8/12/01.
13. The National Institutes of Health, "Etiology of CMC Joint Osteoarthritis," Co-Investigator, 1 R01 AR41020, $531,987 (DC) $907,038 (TC), 4/1/98-3/31/02.
14. The National Institutes of Health, SBIR Phase I, "Laser-Assisted Cartilage Repair Using Collagen Adhesives," 1-R43-AR48738-01, Co-Investigator, $32,943 (TC), 4/17/02-10/16/02.
15. The National Institutes of Health, RO1, "Anisotropy and Nonlinearity of Cartilage Mechanics," Principal Investigator, 1 R01 AR46532, $457,892 (DC), $724,377 (TC), 2/1/00-1/31/04.
16. National Institutes of Health, R01 AR43628, "Biotribology of Diarthrodial Joints," Principal Investigator, $525,000 (DC), $845,205 (TC), 6/1/00-5/31/04.
17. The National Institutes of Health, R01 AR49922, "Intervertebral Disc Response to Cyclic Loading In Vivo," Principal Investigator: C. T. Hung, $1,041,497 (TC), 09/26/02-08/31/06.
18. The National Institutes of Health, R21 EB004532, “Confined Compression Of Single Cells Using AFM,” Principal Investigator: K.D. Costa, $275,000 (DC), $423,045 (TC), 9/1/04-8/31/06.
19. The National Institutes of Health, R21 AR053530, “Tissue Engineered Osteochondral Patella Resurfacing,” Principal Investigator: J.L. Cook (U Missouri), C.T. Hung (Consortium PI at Columbia), $275,000 (DC), $420,323 (TC), (Consortium: $90,747 TC), 3/1/06-2/28/09.
20. National Institutes of Health, R01 AR43628, "Biotribology of Diarthrodial Joints," Principal Investigator: G.A. Ateshian, $704,000 (DC), $1,084,973 (TC), 7/1/04-4/30/09.
21. The Musculoskeletal Transplant Foundation, MTF CU07-194, “Physiologic Loading for Long-Term Maintenance of Osteochondral Grafts in Culture,” Principal Investigator: C.T. Hung, $125,000 (TC), 01/01/08-5/31/09.
22. National Institutes of Health, R01 AR46568, "Physiologic Loading for Cartilage Tissue Engineering," Principal Investigator: C. T. Hung, $1,400,000 (TC), 1/24/00-08/31/09.
23. The National Institutes of Health, R01, "Anisotropy and Nonlinearity of Cartilage Mechanics," Principal Investigator: G.A. Ateshian, 1 R01 AR46532, $910,000 (DC), $1,430,516 (TC), 2/1/04-1/31/10.
24. The National Institutes of Health, R01 AR052871, “Chondrocyte Mechanotransduction Using Microfluidics,” Principal Investigator: C.T. Hung, $1,449,000 (TC), 08/06/06-7/31/10.
25. The National Institutes of Health, R01 GM083925, “FEBio - Finite Elements for Biomechanics and Biophysics,” Co-Principal Investigators: Gerard A. Ateshian and Jeffrey A. Weiss (University of Utah) $1,091,684 (DC), $1,318,933 (TC), 09/30/08-09/01/12.
26. National Institutes of Health, R01 AR46568, "Physiologic Loading for Cartilage Tissue Engineering," Principal Investigator: C. T. Hung, $3,156,823 (TC), 09/01/09-08/31/14.
27. National Institutes of Health, R01 AR043628, “Biotribology of Diarthrodial Joints,” Principal Investigator: G.A. Ateshian, $1,241,280 (TC), 06/01/2010-11/30/2014.

28. The National Institutes of Health, R01 GM083925, "FEBio - Finite Elements for Biomechanics and Biophysics," Co-Principal Investigators: Gerard A. Ateshian and Jeffrey A. Weiss (University of Utah) $981,488 (DC), $1,182,643 (TC), 09/1/12-08/31/16.
29. National Institutes of Health, R01 AR060361, "Optimizing Nutrient Supply in Large Engineered Cartilage Tissue Constructs," Co-Principal Investigators: Gerard A. Ateshian and Clark T. Hung, $1,125,000 (DC), $1,742,366 (TC), 9/20/10-8/31/2016.
30. Columbia-Coulter Translational Research Partnership, WHCF CU12-0369, "Osteochondral allograft bending: Safely reshaping articular surfaces for treating osteoarthritis," Co-Principal Investigators: G.A. Ateshian, M.P. Rosenwasser, $91,880 (DC), 09/01/14- 12/31/16.
31. National Institutes of Health, T32 AR059038, "Multidisciplinary Engineering Training in Musculoskeletal Research," Principal Investigator: G.A. Ateshian, $1,269,000 (DC), $1,332,120 (TC), 09/01/2011-08/31/2017.
32. Honda Motor Company Fundamental R&D Research Labs, "Edema Simulations with FEBio, Phase I" Co-Investigator (PI: Barclay Morrison) $120,000 (TC), 01/01/2018-03/31/2018.
33. Honda Motor Company Fundamental R&D Research Labs, "Edema Simulations with FEBio, Phase II," Co-Investigator (PI: Barclay Morrison) $130,000 (TC), 04/01/2018-12/31/2018.
34. Honda Motor Company Fundamental R&D Research Labs, "Edema Simulations with FEBio, Phase III" Co-Investigator (PI: Barclay Morrison) $113,088 (TC), 04/01/2019-09/30/2019.

Proposals Pending

1. Department of Defense Peer Reviewed Medical Research Program, "Synovial Patch for Intra-Articular Delivery of Dexamethasone for Prevention of PTOA," Principal Investigator: Clark T. Hung, $1,2000,000 (DC), $1,569,227 (TC), 09/01/2018-08/31/2021.
2. The National Institutes of Health, R01 GM083925, "FEBio - Finite Elements for Biomechanics and Biophysics," Co-Principal Investigators: Gerard A. Ateshian and Jeffrey A. Weiss (University of Utah) $2,476,773 (TC), $880,614 (TC to GAA), 09/1/2020- 08/31/2024. Impact Score: 20, Percentile: 2.
3. The National Institutes of Health, R01 AR077587, "Bioengineering Study of the Synovium Role in Mitigating Normal Articular Cartilage Wear and Tear," Co-Principal Investigators: Clark T. Hung and Gerard A. Ateshian, $1,587,370 (TC), 07/01/2020-06/30/2024.
4. The National Institutes of Health, R01 DK125892, "Biomechanical disequilibrium in ciliopathies," Subcontract Principal Investigator (Co-PIs Evren U. Azeloglu, Luca G. Gusella, Mt. Sinai Hospital, New York), $3,966,590 (TC), $862,590 (TC to GAA), 07/01/2020-06/30/2025.

Consultation and Mentorship on Grants

1. The National Institutes of Health, "Mechanical Stimulation of IVD Cells;" Consultant, R01 AR47442, PI: Lori A. Setton, Duke University, 03/01/2001-02/28/2006.

2. The National Institutes of Health, "Correlates of cartilage thickness in the knees of subjects in the Framingham Study;" Consultant, PI: David T. Felson, Boston University.
3. The National Institutes of Health, "Tissue engineering of temporomandibular joint cartilage;" Mentor: B1K22 DE14228, 07/01/2001-06/30/2004, PI: Steven B. Nicoll, Columbia University.
4. The National Institutes of Health, R01 AR053344, "Biomechanics of the Dysplastic Hip," Principal Investigator: J.A. Weiss, 07/01/2007-06/30/2012.

Journal Review Activities

American Journal of Sports Medicine
Annals of Biomedical Engineering
Biomechanics and Modeling in Mechanobiology
Biorheology
Cellular and Molecular Bioengineering
Clinical Orthopaedics and Related Research
International Journal of Engineering Science
International Journal of Non-Linear Mechanics
International Journal for Numerical Methods in Engineering
Journal of Biomechanical Engineering
Journal of Shoulder and Elbow Surgery
Journal of Structural Biology
Journal of Orthopaedic Research
Journal of Physical Chemistry
Magnetic Resonance in Medicine
Medical Engineering and Physics
Osteoarthritis and Cartilage
Tissue Engineering

Grant Review Activities

National Institute of Aging, ad hoc reviewer
National Institute of Arthritis and Musculoskeletal and Skin Diseases, ad hoc reviewer
National Science Foundation, ad hoc reviewer
Natural Sciences and Engineering Research Council of Canada
The Whitaker Foundation, consulting reviewer

Post-Doctoral Fellows

Michael A. Soltz, PhD, Columbia University, New York, NY, Advisor: Gerard A. Ateshian (2000-2001)

Steven B. Nicoll, PhD, University of California, Berkeley and San Francisco, Advisor: Dr. Rajendra S. Bhatnagar (2000-2002). Current Position: Professor of Biomedical Engineering, City College of the City University of New York, New York, NY (2010-)

Hui Chen, PhD, Cornell University, Ithaca, NY, PhD Advisor: Subrata Mukherjee (2008-2010). Credit Risk Manager, American Express, New York, NY.

Michael B. Albro, PhD, Columbia University, New York, NY, PhD Advisor: Gerard A. Ateshian (2010-2014). Marie Curie Research Fellow, Imperial College, London, United Kingdom.

Past Doctoral Students

1. Huiqun Wang, 1993-97, Advisor: GA Ateshian, Financial Analyst, Bloomberg, New York, NY.

   Boundary lubrication of articular cartilage: The role of interstitial fluid pressure, surface porosities and equilibrium friction coefficient.

2. Xiaodong Wang, 1994-97, Advisor: GA Ateshian, Financial Analyst, Solomon Brothers, New York, NY.

   The frictional role of interstitial fluid viscosity at the interface of deformable porous media.

3. Michael A. Soltz, 1996-2000, Advisor: GA Ateshian. Current Position: Program Manager, Pre-Clinical, Covidien, North Haven, CT. Past positions: Senior Engineer, US Surgical, North Haven, CT. Engineer II, Thoratec Corp., Pleasanton, CA. Principal Engineer – Research & Development, BD Medical – Medical Surgical Systems, Franklin Lakes, NJ.

   Investigation of a Boundary Friction Model for Articular Cartilage: Effects of Interstitial Fluid Pressurization and Surface Topography

4. Rajeev Kelkar, 1992-96, Advisors: GA Ateshian, VC Mow. Current Position: Insight Science Technology, Sunnyvale, CA. Past Positions: ProAnalysis, Inc., Mountain View, CA; Exponent, Inc., Menlo Park, CA

   Normal and abnormal mechanics of the shoulder: studies of articular geometry, contact and kinematics.

5. S. Daniel Kwak, 1991-97, Advisors: GA Ateshian, VC Mow. Current Position: DePuy Spine, Raynham, MA. Past Positions: IT Engineer, ATG, Boston, MA; Lecturer, Harvard University, Boston Children's Hospital.

   Experimental and mathematical investigation of the human knee: anatomy, kinematics and contact.

6. Liangfeng Xu, 1994-99, Advisors: GA Ateshian, VC Mow. Current Position: Senior Research Engineer, Nokia, Irving, TX.

   Biomechanics of the thumb carpometacarpal joint: Topography, ligamentous structure, articular contact, and kinematics.

7. Chun-Yuh Huang, 1995-2001, Advisors: GA Ateshian, VC Mow. Current Position: Associate Professor of Biomedical Engineering, University of Miami, FL (2009-). Past Positions: Assistant Professor, College of Dental Medicine, Nova Southeastern University, Fort Lauderdale, FL (2006-2008); Postdoctoral fellow, University of Miami, Miami, FL, 2001-2006.

   Biomechanics of soft tissues in the shoulder joint – Glenohumeral cartilage, ligament, and rotator cuff tendon.

8. Zohara Cohen, 1994-2001, Advisors: GA Ateshian, VC Mow. Current Position: Program Director, Division of Discovery Science & Technology, National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health, Bethesda, MD. Past Position: Postdoctoral research fellow, Physical Disabilities Branch, National Institutes of Health, Bethesda, MD, 2001-2006.

   Analysis of diagnostic tools and treatment methods for osteoarthritis in the patellofemoral joint: In vivo methods for employing magnetic resonance imaging

9. Vincent Wang, 1996-2001, Advisors: GA Ateshian, VC Mow. Current Position: Associate Professor, Department of Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, VA. Past Positions: Assistant Professor, Dept. of Orthopaedic Surgery, Rush University Medical Center, Chicago, IL. Post-doctoral fellow, Mt-Sinai Hospital. New York, NY, 2001-2006.

   Biomechanics of the normal and surgically reconstructed shoulder

10. Changbin Wang, 1999-2001, Advisors: CT Hung, GA Ateshian. Current Position: Director, OPEN Underwriting - Pricing and Balance Transfer, American Express, New York, NY. Past position: Post-doctoral fellow, Columbia University, New York, NY.

    Digital video microscopy-based determination of cartilage inhomogeneity, anisotropy and tension-compression nonlinearity: Implications on chondrocyte environment

11. Robert L. Mauck, 1998-2003, Advisors: CT Hung, GA Ateshian. Current Position: Mary Black Ralston Professor For Education And Research In Orthopaedic Surgery, Department of Orthopaedic Surgery, University of Pennsylvania, Philadelphia (2005-). Past Position: Post-doctoral fellow, National Institutes of Health (2003-2005).

    Functional tissue engineering of articular cartilage: The effect of physical forces on the in vitro growth of engineered constructs

12. Ramaswamy Krishnan, 1999-2004, Advisor; GA Ateshian. Current Position: Assistant Professor, Department of Emergency Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA (2011-). Past Positions: Engineer, Exponent, Inc., Philadelphia, PA (2004-2005); Research Fellow, Department of Environmental Health, Harvard School of Public Health, Cambridge, MA (2005-2011).

    Role of interstitial fluid pressurization in articular cartilage lubrication

13. Seonghun Park, 2002-2005, Advisor: GA Ateshian. Current Position: Professor of Mechanical Engineering, Pusan National University, South Korea (2017-). Past Positions: Associate Professor of Mechanical Engineering, Pusan National University (20011-2017); Assistant Professor of Mechanical Engineering, Pusan National University (2007-2011); Post-doctoral fellow, Hospital for Special Surgery, New York (2005-2007).

    Interstitial fluid flow-dependent and flow-independent mechanical and tribological response of articular cartilage

14. Ines Basalo Perez-Luna, 2000-2005, Advisor: GA Ateshian. Current Position: Assistant Professor in Practice, Department of Mechanical Engineering, University of Miami, Miami, FL. Past Positions: Adjunct Professor of Mechanical Engineering, Columbia University, New York, NY (2008-). Adjunct Professor of Mechanical Engineering, The Cooper Union (2007-2008); CIBC World Markets Corp., New York (2006-2007).

    Effects of enzymatic degradation on the frictional properties of articular cartilage and development of an orthotropic finite deformation constitutive law

15. Nadeen Chahine, 2000-2006, Advisors: GA Ateshian, CT Hung. Current Position: Associate Professor of Biomechanics (in Orthopaedic Surgery), Department of Orthopaedic Surgery, Columbia University, New York, NY (2017-). Past Position: Associate Professor of Molecular Medicine and Neurosurgery, Feinstein Institute for Medical Research, Manhasset, NY (2008-2017). Lawrence Postdoctoral Fellow, Lawrence Livermore National Lab, California (2006-2008).

Multi-scale measurements of the mechanical and transport properties of native and engineered articular cartilage

16. Eric G. Lima, 2001-2008, Advisors: CT Hung, GA Ateshian. Current Position: Professor of Mechanical Engineering, The Cooper Union, New York, NY (2019-). Past Positions: Associate Professor of Mechanical Engineering, The Cooper Union, New York, NY (2008-2019).

    The tissue engineering of functional osteochondral construct for cartilage repair

17. Clare Canal, 2002-2009, Advisor: GA Ateshian. Past Position: Postdoctoral Fellow, Department of Orthopaedic Surgery, Mt. Sinai Hospital, New York, NY (2011-2013).

    Contact mechanics of articular layers: 2D strain fields and their relation to tissue inhomogeneity.

18. Matteo Caligaris, 2004-2010, Advisor: GA Ateshian. Current Position: Senior Design Engineer, Pall Life Science, Media technology and Development, Port Washington, NY (2012-).

    Effect of migrating contact area and degenerative joint disease on interstitial fluid pressurization and the frictional response of articular cartilage

19. Michael Albro, 2005-2010, Advisor: GA Ateshian. Current Position: Postdoctoral fellow, Department of Mechanical Engineering, Columbia University, New York, NY (2010-)

    Solute transport in porous deformable media: Active uptake in dynamically loaded tissue and molecular partitioning in the cellular cytoplasm

20. Roger Goldman, 2007-2011, Advisors: N. Simaan, GA Ateshian. Current Position: University of California Davis Medical Group Radiology, Sacramento, CA (2015-). Past Positions: Resident in Radiology, Stanford Medicine, Stanford CA (2013-2015). MD-PhD fellow and Resident, Columbia University Medical Center, New York, NY (2005-2013).

    Analysis, algorithms, and control for intelligent surgical exploration and intervention

21. Sevan Oungoulian, 2008-2015, Advisor: GA Ateshian. Current Position: Senior Staff Scientist, Food and Drug Administration, Washington, D.C. (2017-). Past Position: Development Scientist, TriReme Medical Inc., Pleasanton, CA (2015-2017).

    Friction and wear measurements of bovine articular cartilage against non-native materials

22. Charlie Yongpravat, 2009-2015, Advisors: GA Ateshian, CS Ahmad. Current Position: Biomedical Engineer, Division of Cardiovascular Devices, Food and Drug Administration, Washington, D.C. (2015-).

    Pre-surgical planning of total shoulder arthroplasty and glenohumeral instability repair

23. Alexander D. Cigan, 2010-2016, Advisor: GA Ateshian. Current Position: Medical Writer at BGB Group, New York, NY (2016-)

    Nutrient channels to aid the growth of articular surface-sized engineered cartilage constructs

24. Brian K. Jones, 2010-2016, Advisor: GA Ateshian. Current Position: Research Associate, Department of Biomedical Engineering, University of Virginia, VA (2016-)

    Articular cartilage contact mechanics and development of a bendable osteochondral allograft

25. Robert J. Nims, 2010-2016, Advisor: GA Ateshian. Current Position: Postdoctoral Fellow, Department of Orthopaedic Surgery, University of Washington in St. Louis, MO (2016-)

    Optimizing cartilage tissue engineering through computational growth models and experimental culture protocols.

26. Chieh Hou, 2012-2018, Advisor: GA Ateshian. Current Position: Postdoctoral Associate, Department of Biomedical Engineering, University of Minnesota, MN (2018-).
    Implementation and validation of finite element framework for passive and active membrane transport in deformable multiphasic models of biological tissues and cells
27. Krista M. Durney, 2012-2018, Advisors: GA Ateshian and CT Hung. Current Position: Product Marketing and Sales Manager at TARA Biosystems, New York, NY (2019-). Past Position: Research Intern, Goldman Sachs, New York, NY (2018-2019).
    Investigations of articular cartilage delamination wear and a novel laser treatment strategy to increase wear resistance
28. Brandon K. Zimmerman, 2014-2020, Advisor: GA Ateshian. Current Position: Postdoctoral Fellow, Department of Mechanical Engineering, Johns Hopkins University, Baltimore, MD (2020-).
    Mechanically mediated fatigue failure in articular cartilage: Experimental, theoretical, and computational models

Current Doctoral Students

1. Jay Shim (NSF Fellow), 2015-, Advisor: GA Ateshian
2. Courtney Shaeffer, 2018-, Advisor: GA Ateshian
3. Claire Sise, 2018-, Advisor: GA Ateshian
4. Katherine Spack, 2018-, Advisor: GA Ateshian
5. Kimberly Kroupa (Presidential Fellow), 2019-, Advisor: GA Ateshian

Masters and Visiting Students

Michael Jenkins, 1995-96
James Kim, 1995-96
Anna Stankiewicz, 1997-99
Kin Tso, 1998
Christine Palma, 1999-2000
Rumana Huq, 1999
Ines Basalo Perez-Luna, 2000
Steven Steer, 2000
Seonghun Park, 2000
Malaika Gamble, 2000
Nadine Chahine, 2000
Adam Mantzaris, 2001-2002
George Yuan, 2001-2002
James W. Raistrick, 2002-2003
Noah Meade, 2002-2003
Bryte Moa-Anderson, 2002-2003
Michael Albro, 2004-2005
Michael Mitchell, 2004-2005
Paola de Leon, 2004-2005
Victoria Wei, 2004-2005
Christine Schwaller, 2005-2006

Daniel Ginat, 2005
Michael Kaplun, 2005-2008
Vikram Rajan, 2006-2009
Oluwaseun Omofoye, 2007
Ricardo Vallejo Estrada, 2007
Elliot Greenblatt, 2008
Bo Chen, 2009
Stephany Chang, 2009-2010
Orian Ben-Artzi, 2010-2011
Thomas Schmidt, 2011 (visiting, Duisberg-Essen University, Germany)
Szusien Chen, 2011
Zekai Zhou, 2012
Daye Lin, 2012
Sara Manzano Martínez, 2013 (visiting, Zaragoza University, Spain)
Hadley Feingold, 2014 (visiting, Wesleyan University, CT)
Lucie Karbowski, 2014 (visiting, University of Lorraine, France)
Antoine Dusséaux, 2015 (visiting, Ecole Polytechnique, France)
Marina Morrow, 2015 (visiting, University of Rochester, NY)
James Boorman-Padgett, 2015-2016
Marion Lopez 2016 (visiting, Ecole Nationale Supérieure de Techniques Avancées, France)
Alex Chen, 2016-2017
Léa Montégut, 2017 (visiting, Ecole Polytechnique, France)
Sonia Donde, 2017
Shivam Sonar, 2017-2018
Courtney Shaeffer, 2017-2018
Martin Xiberras, 2018 (visiting, Ecole Polytechnique, France)
Ashritha Eadara, 2018-2020
Minghui Tian, 2018-2019

Undergraduate Students (ME E3900-3901 Honors Tutorial Advisees / ME E3998 Projects in Mechanical Engineering, Summer Internships)

Michael Gertner (1991), Vincent Wang (1993-94), Zohara Cohen (1994), Cheryl Naeher (1994), Amanda Adams (1994), Bruce Badner (1994), Nina Padmore (1994), Steve Thomopoulos (1994), Michael Jenkins (1995), Fazal Mohd-Ghazali (1995), William Morrison (1996-97), Alex Shterenberg (1996), Stephanie Burky (1997), Ruddy Castillo (1997), Oladapo Fakunle (1998-99), Shant Barsoumian (1999-2000), Jennifer Wade (1999), Jimmy Deng (2000), Steven Steer (2000), Aaron Williams (2000-2001), Monika Kopacz (2000-2003), Joshua Mason (2001), Lindsay Kuhn (2001-2002), Rania El-Beshbeshy (2002-2003), Nicole Gabriel (2002), Rena Ridovsky (2002-2003), Qi Qi Cheng (2002-2004), Barry Wohl (2002-2003), Gidon Ofek (2003), Elise Mariner (2003), David Raj (2003-2004), Wasnard Victor (2003-2005), Paola de Leon (2004), Tania Ullah (2004), Michael Carter (2004-2005), John Grando (2007), Roland Li (2007-2010), Leah Petersen (2008), Rajan Banerjee (2008-2010), Mai Hyunh (2009-2010), Frances Bell (2010), Richard Romeo (2010), Chelsea Saniel (2010), Yuna Saiki (2010), Sung Hoon Steven Yoon (2010-2011), Brenda Chen (2011), John Esau (2011-2012), Marissa Dreyer (2011-2012), Calvin Zhu (2011-2012), Kevin Yeroushalmi (2011-2012), Kristin Hehir (2011-2012),

Mary Quien (2012), Garren Tutunjian (2012), Jay Shim (2012-2014), Daniel Park (2012-2013), Kathleen Atkatsh (2013), Akaljot Singh (2013-2015), Kelly Terlizzi (2014-2015), Ashley Koo (2015), Jason Suh (2015), McKenzie Sup (2016), Wing-Sum Law (2016-2017), Claire Sise (2017), Katherine Guan (2017), Deyanisse Monegro (2017), Michael Anne Bolene (2017-2018), David de Santos (2019-2020).

Teaching

Fall 1991	ME E3601 Classical Control Systems (48 students)
Spring 1992	EM E3105 Mechanics (71 students)
Fall 1992	ME E4701 Introduction to Biomechanics (14 students)
Spring 1993	ME E3409 Introduction to Computer-Aided Design (51 students)
Fall 1993	ME E3401 Mechanics of Machines (37 students)
Spring 1994	ME E3408 Introduction to Computer-Aided Design I (49 students)
Fall 1994	ME E4701 Introduction to Biomechanics (16 students)
Fall 1994	ME E6422 Introduction to Elasticity I (17 students)
Spring 1995	EM E3105 Mechanics (19 students)
Fall 1995	ME E6422 Introduction to Elasticity I (12 students)
Spring 1996	EM E3105 Mechanics (26 students)
Fall 1996	ME E3401 Mechanics of Machines (19 students)
Spring 1997	ME E3408 Computer Graphics and Design (33 students)
Fall 1997	ME E3409 Computer Aided Design (29 students)
Fall 1997	ME-BME E4702 Advanced Musculoskeletal Biomechanics (12 students, with XE Guo)
Spring 1998	ME E3408 Computer Graphics and Design (26 students)
Spring 1998	BME E3910 Biomedical Engineering Design (9 students)
Spring 1999	ME E3408 Computer Graphics and Design (30 students)
Spring 1999	BME E3910 Biomedical Engineering Design (18 students)
Fall 1999	ME E6422 Introduction to Elasticity I (19 students)
Fall 1999	ME-BME E4702 Advanced Musculoskeletal Biomechanics (18 students, with XE Guo)
Spring 2000	ME E3408 Computer Graphics and Design (24 students)
Spring 2000	BME E3910 Biomedical Engineering Design (31 students, with team)
Spring 2000	BME E3820 Biomedical Engineering Laboratory II (35 students, 4 of 14 weeks, with XE Guo)
Spring 2000	BME E4502 Tissue Engineering II (30 students, 2.5 of 14 weeks, with CT Hung)
Fall 2000	ME E3401 Mechanics of Machines (18 students)
Spring 2001	ME E3408 Computer Graphics and Design (36 students)
Spring 2001	BME E3910 Biomedical Engineering Design (42 students, with team)
Spring 2001	BME E3820 Biomedical Engineering Laboratory II (34 students, 6 of 14 weeks, with CT Hung)
Fall 2001	MEBM E6310 Mixture Theories for Biological Tissues I (9 students)
Spring 2002	ME E3408 Computer Graphics and Design (32 students)
Spring 2002	MEBM E6311 Mixture Theories for Biological Tissues II (11 students)
Spring 2002	BME E3820 Biomedical Engineering Laboratory II (38 students, 5 of 14 weeks, with CT Hung)

Fall 2002	MECE E6422 Introduction to Elasticity I (19 students)
Spring 2003	ME E3408 Computer Graphics and Design (42 students)
Spring 2003	BME E3820 Biomedical Engineering Laboratory II (48 students, 5 of 14 weeks, with CT Hung)
Spring 2003	BME E3910 Biomedical Engineering Design (supervised a design teams, with P Sajda)
Fall 2003	MECE E3409 Computer-Aided Design (18 students)
Fall 2003	MECE E1001 Mechanical Engineering: From Micromachines to Jumbo Jets (37 students, 2 of 14 weeks)
Spring 2004	MECE E3408 Computer Graphics and Design (39 students)
Fall 2004	MECE E3409 Computer Aided Design (39 students)
Fall 2004	MEBM E6310 Mixture Theory for Biological Tissues (12 students)
Fall 2004	BMEN E3830 Biomedical Engineering Lab II (69 students, 2 of 14 weeks)
Spring 2005	On sabbatical leave
Fall 2005	MECE E3409 Computer Aided Design (41 students)
Fall 2005	MECE E6422 Introduction to Elasticity I (21 students)
Spring 2006	BMEN E3920 Biomedical Engineering Design II (68 students)
Fall 2006	MECE E3409 Computer Aided Design (55 students)
Fall 2006	MEBM E6310 Mixture Theory for Biological Tissues I (8 students)
Spring 2007	MEBM E6311 Mixture Theory for Biological Tissues II (8 students)
Fall 2007	MECE E3409 Computer Aided Design (41 students)
Fall 2007	MECE E6422 Introduction to Elasticity I (17 students)
Fall 2008	MECE E1001 From Micromachines to Jumbo Jets (35 students)
Fall 2009	MECE E1001 From Micromachines to Jumbo Jets (45 students)
Fall 2009	MEBM E6310 Mixture Theory for Biological Tissues I (7 students)
Spring 2010	MEBM E6311 Mixture Theory for Biological Tissues II (4 students)
Fall 2010	MECE E3409 Machine Design (45 students)
Fall 2010	MECE E6422 Introduction to Elasticity I (39 students)
Fall 2011	MECE E3409 Machine Design (62 students)
Fall 2011	MECE E6422 Introduction to Elasticity I (15 students)
Fall 2012	MECE E3409 Machine Design (62 students)
Spring 2013	MEBM E6310 Mixture Theory for Biological Tissues I (12 students)
Fall 2013	MECE E6422 Introduction to Elasticity I (21 students)
Spring 2014	MECE E3450 Computer-Aided Design (26 students)
Fall 2014	On sabbatical leave
Spring 2015	MECE E6100 Advanced Mechanics of Fluids (22 students)
Fall 2015	MECE E3450 Computer-Aided Design (14 students)
Fall 2015	MECE E6422 Introduction to Elasticity (32 students)
Spring 2016	MEBM E6310 Mixture Theory for Biological Tissues (3 students + 4 auditors)
Fall 2016	MECE E6422 Introduction to Elasticity (23 students)
Fall 2016	MECE E6100 Advanced Mechanics of Fluids (35 students)
Spring 2017	MECE E3450 Computer-Aided Design (9 students)
Fall 2017	MECE E6100 Advanced Mechanics of Fluids (24 students)
Spring 2018	On sabbatical leave
Fall 2018	MECE E6100 Advanced Mechanics of Fluids (19 students)
Spring 2019	MECE E4302 Advanced Thermodynamics (10 students)

Spring 2019	MECE E3450 Computer-Aided Design (17 students)
Fall 2019	MECE E6100 Advanced Mechanics of Fluids (23 students)
Spring 2020	MEBM E6310 Mixture Theory for Biological Tissues (9 students + 4 auditors)

University Activities

Chair of Undergraduate Committee, Department of Mechanical Engineering (2017-)

Mechanical Engineering Representative to Committee on Instruction (2015-)

Member of Undergraduate Committee, Department of Mechanical Engineering (2015-)

Chair of Fluid Mechanics Search Committee, Department of Mechanical Engineering (2014-2015)

Chair of Department of Mechanical Engineering (2011-2014)

Member of Graduate Committee, Department of Mechanical Engineering (2011-2015)

Member of SEAS Strategic Planning Committee (2010)

SEAS Dean Search Committee (2007-2009)

Chair of Faculty Search Committee, Department of Mechanical Engineering (2007-2008)

Member of Graduate Committee, Department of Biomedical Engineering (2007-2011)

Chair of Undergraduate Committee, Department of Mechanical Engineering (2006-2011)

Member of Laboratory Committee, Department of Biomedical Engineering (2005-2007)

Academic Quality Fund Review Committee (2003-2004)

Egleston Medal Committee (2003-2004, 2010-)

Chair of ABET Committee, Department of Biomedical Engineering (2001-2003)

Member of ABET Committee, Department of Biomedical Engineering (2000-2003)

Certified in Good Clinical Practices, Office of Clinical Trial, Columbia University/New York-Presbyterian Hospital (2000)

Vice-Chair, Department of Biomedical Engineering (1999-2002)

Chair of Laboratory Committee, Department of Biomedical Engineering (1999-2002)

Member of Undergraduate Committee, Department of Biomedical Engineering (1999-2007)

Member of Graduate Committee, Department of Biomedical Engineering (1999-2002)

Y2K Representative, Department of Mechanical Engineering (1999-2000)

Chair of Laboratory Committee, Department of Mechanical Engineering (1995-1997)

Member of Center for Biomedical Engineering (1995-2000)

Sophomore Advisor, Department of Mechanical Engineering (1995-1996)

Member of Biomedical Engineering Program Steering Committee (1995).

University Senator, (1994-1996) (Faculty Affairs Committee, Libraries and Academic Computing Committee)

Secretary, Mechanical Engineering Faculty Meetings (1993-1994).

Undergraduate Committee, Department of Mechanical Engineering (1991-present)

Member of Laboratory Committee, Department of Mechanical Engineering (1991-2004)

Doctoral Committee, Ter-Ping Liao, 1993 (ME); Chinchih Fang, 1993 (ME); Anil Kaul, 1993 (ME); Taehee Kim, 1993 (ME); Tamer Wasfy, 1994 (ME); Yungao Sun, 1994 (ME, Chair);

Lilai Yang, 1994 (ME); Don Lin, 1994 (ME); Yoo Chan Jeon, 1994 (ME); Haluk Elci, 1995 (ME); Gangbing Song, 1995 (ME); Dragan Lozancic, 1995 (ME); Bill Yoshimi, 1995 (ME); Nathaniel Bachrach, 1995 (ME); Chen-Ying Wang, 1995 (ME); James C. Iatridis, 1996 (ME); Rajeev Kelkar, 1996 (ME); Yi-Cheng Huang, 1996 (ME); Hyun-Sang Jang (ME), 1996; Raed Kombargi, 1997 (AP); Huiqun Wang, 1997 (ME); S. Daniel Kwak, 1997 (ME); Xiaodong Wang, 1997 (ME); Jianjun Feng, 1999 (ME, City University of New York); Osama R. Mawlawi, 1999 (BE); Liangfeng Xu, 1999 (ME); Michael A. Soltz, 2000 (ME); Hong-Jen Chen, 2001 (ME); Zohara A. Cohen, 2001 (ME); Chun-Yuh Charles Huang, 2001 (ME); Changbin Wang, 2001 (ME); Vincent M. Wang, 2001 (ME); Kuan Zhang, 2002 (ME, Chair); Neil Dong, 2002 (ME); Raphael Akogyeram, 2002 (ME, Chair); Peter A. LeVoci, 2002 (ME, Chair); Dejan Milentijevic, 2003 (BME, City University of New York); Robert L. Mauck, 2003 (BME); Matthew F. Koff, 2004 (BME); Ramaswamy Krishnan, 2004 (ME); Pen-Hsiu Grace Chao, 2005 (BME, Chair); Seonghun Park, 2005 (ME); Yong Xue Gan, 2005 (ME); Ines Basalo Perez-Luna, 2006 (ME); Nadeen O. Chahine, 2006 (BME); Terri-Ann Kelly, 2006 (BME, Chair); Ningli Liu, 2006 (ME); Andrew Anderson, 2007 (BE, University of Utah); Kenneth W. Ng, 2007 (BME); Kathryn Guterl (BME); Eric G. Lima 2008 (BME); Mattei Ciocarlie (CS); Thomas Alexander Quinn, 2008 (BME), Thai Huu T. Nguyen, 2009 (ME); Liming Bian, 2009 (BME); Michael B. Albro, 2009 (BME); Matteo Caligaris, 2010 (ME); Wei Wei, 2010 (ME); Nandan Nerurkar, 2010 (ME, University of Pennsylvania); Ben Elkin, 2010 (BME, Chair); Gregory Fomovsky, 2010 (BME, Chair); Pablo Prieto-Muñoz, 2012 (ENME); Jean Provost, 2012 (BME); Bhavik Nathwani, 2012 (ME, Chair); Gen Satoh 2013 (ME, Chair); Emil Sandoz-Rosado 2013 (ME, Chair); Colin McAuliffe, 2013 (ENME); Andrea Tan 2014 (BME, Chair); Sonal Sampat 2014 (BME, Chair); Sally Arno 2014 (NYU – Hospital for Joint Diseases); Ronny Li 2014 (BME); Wang Yao 2014 (ME); Charlie Yongpravat 2015 (ME); Margaret Boushell 2015 (BME); Adam Nover 2015 (BME); Alexandre Costet 2016 (BME); Alexander Cigan 2016 (BME); Joon-Hyuk Park 2016 (ME); Michael Fernandez 2016 (ME); Kyoko Yoshida 2016 (ME); Paul Stegall 2016 (ME); Steve Maas 2016 (CS, Univ Utah); Miguel Arriaga 2016 (CIEN); Brendan Roach 2016 (BME, Chair); Pedro Aparício 2016 (Univ of Oxford); Yao (Frank) Wang 2017 (ME, Chair); Yuan Jia 2017 (ME); Dakai Bian 2017 (ME); Iason Apostolakis 2018 (BME); Chieh Hou 2018 (ME); Krista Durney 2018 (BME); SeongHong Na 2018 (CEEM); Eben Estell 2018 (BME); Ben Czerwin 2019 (ME); Andrea Westervelt 2019 (ME); Babak Naghizadeh Safa 2019 (BME, U Delaware); Haohan Zhao 2019 (ME); Xun Wang 2019 (ME); Rob Stefani 2019 (BME); Jay Shim 2019 (ME); Brandon Zimmerman 2020 (ME); Cassie Meeker 2020 (ME), Lampros Svolos (ENME).

Book Editorships

1. Proceedings of the 1999 Summer Bioengineering Conference. V.K. Goel, R.L. Spilker, G.A. Ateshian and L.J. Soslowsky, eds. ASME, BED-Vol. 42,1999.
2. Proceedings of the 2001 Summer Bioengineering Conference. R.D. Kamm, G.W. Schmid-Schonbein, G.A. Ateshian and M.S. Hefzy, eds. ASME, BED-Vol. 50, 2001.
3. Computer Methods, Imaging and Visualization in Biomechanics and Biomedical Engineering, Editors: **Ateshian, Gerard A.,** Myers, Kristin M., Tavares, João Manuel R. S. (Eds.), Lecture Notes in Computational Vision and Biomechanics, Springer Nature, Switzerland, 2020.

Book Chapters

1. Mow, V.C., Ateshian, G.A., and Rosenwasser, M.P. (1988) Development of finite element models for diarthrodial joints. In: Computational Methods in Bioengineering, ASME, R.L. Spilker and B.R. Simon (eds.), 9:1-14.
2. Soslowsky, L.J., Ateshian, G.A., and Mow, V.C. (1990) Stereophotogrammetric Determination of Joint Anatomy and Contact Areas. In: Biomechanics of Diarthrodial Joints, V.C. Mow, A. Ratcliffe, and S.L-Y. Woo (eds.), Springer-Verlag, New York, 2:243-268.
3. Mow, V.C., Ateshian, G.A., and Ratcliffe, A. (1992) Anatomic Form and Biomechanical Properties of Articular Cartilage of the Knee Joint. In: Biology and Biomechanics of the Traumatized Synovial Joint, The Knee as a Model, G.A.M. Finerman, and F.R. Noyes (eds), AAOS, 55-81.
4. Ateshian, G.A., Colman, W.W., and Mow, V.C. (1994) Quantitative Anatomy of the Knee Joint. In: Knee Surgery, F.H. Fu, C.D. Harner, and K.G. Vince (eds), Williams & Wilkins, Baltimore, Maryland, Vol. 1, pp. 55-76.
5. Mow, V.C., Ateshian, G.A., and Spilker, R.L. (1995) Biomechanics of Diarthrodial Joints: A Review. In: The Laureate of the Dragon, Kai-Ming Chan (ed), Waverly Info-Med Ltd, Hong Kong, pp. 3-31.
6. Ateshian, G.A., and Soslowsky, L.J. (1997) Quantitative anatomy of diarthrodial joint articular layers. In:Basic Orthopaedic Biomechanics, V.C. Mow and W.C. Hayes (eds), Raven Press, New York, 2nd ed, pp. 253-273.
7. Mow, V.C., and Ateshian, G.A. (1997) Friction, Lubrication, and Wear of Diarthrodial Joints. In:Basic Orthopaedic Biomechanics, V.C. Mow and W.C. Hayes (eds), Raven Press, New York, 2nd ed, pp. 275-315.
8. Mow, V.C., Flatow, E.L., and Ateshian, G.A. (2000) Biomechanics. In: Orthopaedic Basic Science, J. A. Buckwalter, T.A. Einhorn, and S.R. Simon (eds), American Academy of Orthopaedic Surgeons, Rosemont, IL, 2nd ed, pp. 133-180.
9. Ateshian, G.A., and Wang, X. (2000) Boundary Conditions at the Viscous Sliding Interface of Incompressible Porous Deformable Media. In: Multifield Problems, State of the Art. A.-M. Sändig, W. Schiehlen, W. Wendland (eds), Springer Verlag, Berlin, pp. 115-124.
10. Ateshian, G.A., and Hung, C.T. (2004) Functional Properties of Native Articular Cartilage. In: Functional Tissue Engineering: The Role of Biomechanics. F. Guilak, D. Butler, S.A. Goldstein, D. Mooney (eds), Springer-Verlag, New York, pp.46-68.
11. Hung, C.T., and Ateshian G.A. (2019) Biomechanics of Articular Cartilage and its Response to Loading. In: Basic Orthopaedic Science, American Academy of Orthopaedic Surgeons, in press.

Full-Length Papers

1. **Ateshian, G.A.**, Soslowsky, L.J., and Mow, V.C., 1991. Quantitation of articular surface topography and cartilage thickness in knee joints using stereophotogrammetry. *J Biomech* **24**(8)**,** 761-776
2. Soslowsky, L.J., Flatow, E.L., Bigliani, L.U., Pawluk, R.J., **Ateshian, G.A.**, and Mow, V.C., 1992. Quantitation of in situ contact areas at the glenohumeral joint: a biomechanical study. *J Orthop Res* **10**(4)**,** 524-534

3. **Ateshian, G.A.**, Rosenwasser, M.P., and Mow, V.C., 1992. Curvature characteristics and congruence of the thumb carpometacarpal joint: differences between female and male joints. *J Biomech* **25**(6)**,** 591-607
4. **Ateshian, G.A.**, 1993. A B-spline least-squares surface-fitting method for articular surfaces of diarthrodial joints. *J Biomech Eng* **115**(4A)**,** 366-373
5. Mow, V.C., **Ateshian, G.A.**, and Spilker, R.L., 1993. Biomechanics of diarthrodial joints: a review of twenty years of progress. *J Biomech Eng* **115**(4B)**,** 460-467
6. **Ateshian, G.A.**, Kwak, S.D., Soslowsky, L.J., and Mow, V.C., 1994. A stereophotogrammetric method for determining in situ contact areas in diarthrodial joints, and a comparison with other methods. *J Biomech* **27**(1)**,** 111-124
7. Mow, V.C., Bachrach, N.M., and **Ateshian, G.A.**, 1994. Effects of a subchondral bone perforation on the load support mechanism within articular cartilage. *Wear* **175**(1-2)**,** 167-175
8. **Ateshian, G.A.**, Lai, W.M., Zhu, W.B., and Mow, V.C., 1994. An asymptotic solution for the contact of two biphasic cartilage layers. *J Biomech* **27**(11)**,** 1347-1360
9. Flatow, E.L., **Ateshian, G.A.**, Soslowsky, L.J., Pawluk, R.J., Grelsamer, R.P., Mow, V.C., and Bigliani, L.U., 1994. Computer simulation of glenohumeral and patellofemoral subluxation. Estimating pathological articular contact. *Clin Orthop Relat Res*(306)**,** 28-33
10. **Ateshian, G.A.**, Ark, J.W., Rosenwasser, M.P., Pawluk, R.J., Soslowsky, L.J., and Mow, V.C., 1995. Contact areas in the thumb carpometacarpal joint. *J Orthop Res* **13**(3)**,** 450-458
11. **Ateshian, G.A.**, and Wang, H., 1995. A theoretical solution for the frictionless rolling contact of cylindrical biphasic articular cartilage layers. *J Biomech* **28**(11)**,** 1341-1355
12. **Ateshian, G.A.**, 1997. A theoretical formulation for boundary friction in articular cartilage. *J Biomech Eng* **119**(1)**,** 81-86
13. Kwak, S.D., Colman, W.W., **Ateshian, G.A.**, Grelsamer, R.P., Henry, J.H., and Mow, V.C., 1997. Anatomy of the human patellofemoral joint articular cartilage: surface curvature analysis. *J Orthop Res* **15**(3)**,** 468-472
14. **Ateshian, G.A.**, and Wang, H., 1997. Rolling resistance of articular cartilage due to interstitial fluid flow. *Proc Inst Mech Eng [H]* **211**(5)**,** 419-424
15. Wang, H., and **Ateshian, G.A.**, 1997. The normal stress effect and equilibrium friction coefficient of articular cartilage under steady frictional shear. *J Biomech* **30**(8)**,** 771-776
16. **Ateshian, G.A.**, Warden, W.H., Kim, J.J., Grelsamer, R.P., and Mow, V.C., 1997. Finite deformation biphasic material properties of bovine articular cartilage from confined compression experiments. *J Biomech* **30**(11-12)**,** 1157-1164
17. **Ateshian, G.A.**, Huiqun, W., and Lai, W.M., 1998. The role of interstitial fluid pressurization and surface porosities on the boundary friction of articular cartilage. *J Tribol, Trans ASME* **120,** 241-251
18. **Ateshian, G.A.**, and Wang, X., 1998. Sliding tractions on a deformable porous layer. *J Tribol, Trans ASME* **120**(1)**,** 89-96
19. Xu, L., Strauch, R.J., **Ateshian, G.A.**, Pawluk, R.J., Mow, V.C., and Rosenwasser, M.P., 1998. Topography of the osteoarthritic thumb carpometacarpal joint and its variations with regard to gender, age, site, and osteoarthritic stage. *J Hand Surg [Am]* **23**(3)**,** 454-464

20. Ahmad, C.S., Kwak, S.D., **Ateshian, G.A.**, Warden, W.H., Steadman, J.R., and Mow, V.C., 1998. Effects of patellar tendon adhesion to the anterior tibia on knee mechanics. *Am J Sports Med* **26**(5)**,** 715-724
21. Soltz, M.A., and **Ateshian, G.A.**, 1998. Experimental verification and theoretical prediction of cartilage interstitial fluid pressurization at an impermeable contact interface in confined compression. *J Biomech* **31**(10)**,** 927-934
22. Mow, V.C., **Ateshian, G.A.**, Lai, W.M., and Gu, W.Y., 1998. Effects of fixed charges on the stress-relaxation behavior of hydrated soft tissues in a confined compression problem. *International Journal of Solids and Structures* **35**(34-35)**,** 4945-4962
23. Cohen, Z.A., McCarthy, D.M., Kwak, S.D., Legrand, P., Fogarasi, F., Ciaccio, E.J., and **Ateshian, G.A.**, 1999. Knee cartilage topography, thickness, and contact areas from MRI: in-vitro calibration and in-vivo measurements. *Osteoarthritis Cartilage* **7**(1)**,** 95-109
24. Kelkar, R., and **Ateshian, G.A.**, 1999. Contact creep of biphasic cartilage layers. *Journal of Applied Mechanics, Transactions ASME* **66**(1)**,** 137-145
25. Donzelli, P.S., Spilker, R.L., **Ateshian, G.A.**, and Mow, V.C., 1999. Contact analysis of biphasic transversely isotropic cartilage layers and correlations with tissue failure. *J Biomech* **32**(10)**,** 1037-1047
26. Kwak, S.D., Ahmad, C.S., Gardner, T.R., Grelsamer, R.P., Henry, J.H., Blankevoort, L., **Ateshian, G.A.**, and Mow, V.C., 2000. Hamstrings and iliotibial band forces affect knee kinematics and contact pattern. *J Orthop Res* **18**(1)**,** 101-108
27. Kwak, S.D., Blankevoort, L., and **Ateshian, G.A.**, 2000. A Mathematical Formulation for 3D Quasi-Static Multibody Models of Diarthrodial Joints. *Comput Methods Biomech Biomed Engin* **3**(1)**,** 41-64
28. Soltz, M.A., and **Ateshian, G.A.**, 2000. Interstitial fluid pressurization during confined compression cyclical loading of articular cartilage. *Ann Biomed Eng* **28**(2)**,** 150-159
29. Mauck, R.L., Soltz, M.A., Wang, C.C., Wong, D.D., Chao, P.H., Valhmu, W.B., Hung, C.T., and **Ateshian, G.A.**, 2000. Functional tissue engineering of articular cartilage through dynamic loading of chondrocyte-seeded agarose gels. *J Biomech Eng* **122**(3)**,** 252-260
30. Lai, W.M., Mow, V.C., Sun, D.D., and **Ateshian, G.A.**, 2000. On the electric potentials inside a charged soft hydrated biological tissue: streaming potential versus diffusion potential. *J Biomech Eng* **122**(4)**,** 336-346
31. Rivers, P.A., Rosenwasser, M.P., Mow, V.C., Pawluk, R.J., Strauch, R.J., Sugalski, M.T., and **Ateshian, G.A.**, 2000. Osteoarthritic changes in the biochemical composition of thumb carpometacarpal joint cartilage and correlation with biomechanical properties. *J Hand Surg [Am]* **25**(5)**,** 889-898
32. Soltz, M.A., and **Ateshian, G.A.**, 2000. A Conewise Linear Elasticity mixture model for the analysis of tension-compression nonlinearity in articular cartilage. *J Biomech Eng* **122**(6)**,** 576-586 PMCID: 2854000.
33. Felson, D.T., Lawrence, R.C., Dieppe, P.A., Hirsch, R., Helmick, C.G., Jordan, J.M., Kington, R.S., Lane, N.E., Nevitt, M.C., Zhang, Y., Sowers, M., McAlindon, T., Spector, T.D., Poole, A.R., Yanovski, S.Z., **Ateshian, G.**, Sharma, L., Buckwalter, J.A., Brandt, K.D., and Fries, J.F., 2000. Osteoarthritis: new insights. Part 1: the disease and its risk factors. *Ann Intern Med* **133**(8)**,** 635-646

34. Kelkar, R., Wang, V.M., Flatow, E.L., Newton, P.M., **Ateshian, G.A.**, Bigliani, L.U., Pawluk, R.J., and Mow, V.C., 2001. Glenohumeral mechanics: a study of articular geometry, contact, and kinematics. *J Shoulder Elbow Surg* **10**(1)**,** 73-84
35. Ahmad, C.S., Cohen, Z.A., Levine, W.N., **Ateshian, G.A.**, and Mow, V.C., 2001. Biomechanical and topographic considerations for autologous osteochondral grafting in the knee. *Am J Sports Med* **29**(2)**,** 201-206
36. Cohen, Z.A., Roglic, H., Grelsamer, R.P., Henry, J.H., Levine, W.N., Mow, V.C., and **Ateshian, G.A.**, 2001. Patellofemoral stresses during open and closed kinetic chain exercises. An analysis using computer simulation. *Am J Sports Med* **29**(4)**,** 480-487
37. Huang, C.Y., Mow, V.C., and **Ateshian, G.A.**, 2001. The role of flow-independent viscoelasticity in the biphasic tensile and compressive responses of articular cartilage. *J Biomech Eng* **123**(5)**,** 410-417
38. Dykyj, D., **Ateshian, G.A.**, Trepal, M.J., and MacDonald, L.R., 2001. Articular geometry of the medial tarsometatarsal joint in the foot: comparison of metatarsus primus adductus and metatarsus primus rectus. *J Foot Ankle Surg* **40**(6)**,** 357-365
39. Kitano, T., **Ateshian, G.A.**, Mow, V.C., Kadoya, Y., and Yamano, Y., 2001. Constituents and pH changes in protein rich hyaluronan solution affect the biotribological properties of artificial articular joints. *J Biomech* **34**(8)**,** 1031-1037
40. Lai, W.M., Sun, D.D., **Ateshian, G.A.**, Guo, X.E., and Mow, V.C., 2002. Electrical signals for chondrocytes in cartilage. *Biorheology* **39**(1-2)**,** 39-45
41. Wang, C.C., Guo, X.E., Sun, D., Mow, V.C., **Ateshian, G.A.**, and Hung, C.T., 2002. The functional environment of chondrocytes within cartilage subjected to compressive loading: a theoretical and experimental approach. *Biorheology* **39**(1-2)**,** 11-25
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