

Curriculum Vitae

Christine Ortiz

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Education

B.S., Materials Science and Engineering, Rensselaer Polytechnic Institute, 1992
M.S., Materials Science and Engineering, Cornell University, 1994
Ph.D., Materials Science and Engineering, Cornell University, 1997

Positions Held

2007-pres. Faculty Director of a new [MIT International Science and Technology Initiatives](#) international exchange program with Israel (developed the program, 2006-2007)
Spring 2008 Visiting Professor and Lady Davis Fellow, Hebrew University of Jerusalem (Israel)
2006-pres. Associate Professor with tenure, Materials Science and Engineering, MIT
2004-2006 Associate Professor without tenure, Materials Science and Engineering, MIT
1999-2004 Assistant Professor, Materials Science and Engineering, MIT
1997-1999 Post-Doctoral Research Associate, University of Groningen, Netherlands
1995,1996 Summer Graduate Research Associate, University of Cambridge, Cavendish Laboratory (UK)
1992 Summer Institutes in Applied Science: Lawrence Livermore National Laboratory / U.C. Davis
1991-1993 Summer Graduate Researcher, National Institute of Standards and Technology (Gaithersburg, MD)

Research Interests (see: [Research Program Technical Summary : http://web.mit.edu/cortiz/www/OrtizResearchSummary2007.pdf](#))

Solid Mechanics; Micromechanics; Nanomechanics; Biological Materials; Musculoskeletal Tissues; Single Molecule Imaging; Single Cell Mechanics; Bioadhesion; Proteoglycans; Cartilage; Bone; Nacre; Ganoine

Teaching Interests

Solid Mechanics; Mechanical Behavior of Materials; Continuum Mechanics; Plasticity; Polymer Mechanics, Rubber Elasticity; Nanomechanics

Diversity Interests (see: [Ortiz Group Diversity Webpage : http://web.mit.edu/cortiz/www/Diversity/mitdiversityhome.html](#))

Best practice pedagogies for underrepresented minority students; Convolution of race and gender in academia; Effect of diversity on the academic enterprise

Editorial Service

2008-pres. Editorial Board, Advanced Biomaterials by WILEY-VCH GmbH & Co KGaA
2006-pres. Editorial Board, International Journal Surface Science and Engineering (Insures)-Inderscience
2006-pres. Coeditor for the journal "*Biointerphase*"
2005-2006 Guest Coeditor, *Journal of Materials Research* Focus Issue "*Mechanics of Biological and Biomimetic Materials at Small Length Scales*"

Professional Service

2008 NSF Civil, Mechanical and Manufacturing Innovation Material Design and Surface Engineering (MDSE), Proposal Reviewer and Panelist (Arlington, VA)

- 2007 Session Chair, 2007 APS March Meeting, Denver, Colorado, Session U4: Interfaces with Synthetic and Biological Polymers, Division of Polymer Physics
- 2007 NSF-CAREER (Faculty Early Career Development in Engineering and Science) Division of Materials Research Proposal Reviewer and Panelist (Arlington, VA)
- 2007 Workshop on "*Interdisciplinary, Globally Leading Polymer Science and Engineering*"; an NSF Workshop co-sponsored by AFOSR, ARO, DOE/BES, NASA, NIH/NIBIB, NIST, and ONR, panelist in the session on "*Technology and Societal Applications*" (Arlington, VA)
- 2007 Organizer, Short Course on "*Advances on the Use of Atomic Force Microscopy for Studies of the Physics of Macromolecular Materials*," at the 2007 American Physical Society Meeting (Denver, Colorado)
- 2007 National Science Foundation (NSF) / Department of Energy (DOE) / National Institutes of Health (NIH) Workshop panelist on *Achieving Racial & Ethnic Equity in Chemistry* (Arlington, VA)
- 2006 NSF-CAREER (Faculty Early Career Development in Engineering and Science) Committee of Visitors Review Panel (Arlington, VA)
- 2006 NSF-CAREER (Faculty Early Career Development in Engineering and Science) Proposal Reviewer and Panelist (Arlington, VA)
- 2006 Participant in Workshop on "*Autonomic Structural Systems for Threat Mitigation*" sponsored by AFOSR, ARO, NSF, ONR and the European Science Foundation (Nice, France)
- 2005 Guest Panelist on NIH Study Section: *Molecular Imaging*
- 2005 Organizer, Short course in *Nanomechanics of Materials and Biomaterials*, Facultad de Ciencias Veterinarias, Universidad de Chile (Santiago, Chile)
- 2004 Panelist: National Nanotechnology Initiative Interagency Grand Challenge Workshop on Instrumentation and Metrology, NIST (Gaithersburg, MD)
- 2004 NSF Adhesion Proposal Reviewer and Panelist
- 2002 NSF-CAREER (Faculty Early Career Development in Engineering and Science) Division of Materials Research Proposal Reviewer and Panelist (Arlington, VA)
- 2002 International Advisory Board and Session Chair, Fourth International Symposium on Natural Polymers and Composites (São Pedro, Brazil)
- 2002 Session Chair, Annual March Meeting of the American Physical Society, Division of Polymer Physics-Division of Biological Physics, Symposium on Cell-Polymer Interactions (Indianapolis, IN)
- 2001 NSF-NSEC (Nanotechnology Science and Engineering Center) Proposal Reviewer and Reverse Site Visit Panelist (Arlington, VA)
- 1999 NSF-SBIR/STTR (Small Business Innovation Research, Small Business Technology Transfer) Proposal Reviewer and Panelist (Arlington, VA)

Reviewer Science, Nano Letters, Petroleum Research Fund, NSF, NIH, Macromolecules, Langmuir, Journal of Cell Biology, Proceedings of the National Academy of Sciences USA, Biomacromolecules, Journal of Structural Biology, Biomaterials, Colloids and Surfaces A, Journal of Polymer Science Part B: Polymer Physics, Journal of Investigative Dermatology, Advanced Materials, ARO

Professional Societies

American Chemical Society, American Physical Society, Materials Research Society, American Association for the Advancement of Science

Honors

- 2008-2009 Selected to participate in the [Defense Science Study Group](#)
- 2008 Hebrew University - Hadassah Appreciation Medal (Jerusalem, Israel)
- 2008 Lady Davis Fellow, Hebrew University of Jerusalem (Israel)
- 2008 The Shraga Dirnfeld Lecture, Technion - Israel Institute of Technology (Haifa, Israel)
- 2007 The Dow Distinguished Lecturer, University of California, Santa Barbara

2002 NSF-PECASE Award (National Science Foundation-Presidential Early Career Award for Scientists and Engineers), presented at the White House by President George W. Bush

2001 MIT Department of Materials Science and Engineering John Wulff Lectureship Award

2000 NSF-CAREER Award (Faculty Early Career Development in Engineering and Science)

1998 Recognition Award for "Outstanding Alumni" given by the National Consortium for Graduate Degrees for Minorities in Engineering and Science (GEM)

1997 Post-Doctoral Fellowship – NSF and the North Atlantic Treaty Organization

1997 Post-Doctoral Fellowship – Association Pour la Recherche sur le Cancer at the Institute Curie (Paris, France)

1995 NSF Incentives for Excellence Scholarship Prize (awarded to Rensselaer Polytechnic Institute, Department of Materials Science and Engineering in honor of alumni C. Ortiz)

1994 3-year Ph.D. Fellowship – GEM

1994 3-yr Ph.D. Fellowship – Ford Foundation and National Research Council

1994 3-year Ph.D. Fellowship – NSF

1993 Cornell University Engineering Minority Programs Office, Certificate of Academic Achievement

1992 2-year M.S. Fellowship – GEM

1988 Elsbeth Kroeber Memorial Award in the Biological Sciences awarded by the New York Biology Teachers Association

Selected Ortiz Group Student Awards

2008 Lin Han, Selected as a finalist for the Orthopaedic Research Society's New Investigator Recognition Awards (NIRA) at the 54th Annual Meeting of the Orthopaedic Research Society

2006 Kuangshin Tai, Materials Research Society (MRS) Graduate Student Silver Medal

2006 Julian Villarreal, 2nd place in student technical presentation contest at the 2006 Society of Hispanic Professional Engineers (SHPE) Northeast Regional Conference

2005 Jennifer Vandiver, 1st place Poster Presentation Award: Materials Research Society, Symposium K "*Engineered Biointerfaces*"

2004 Delphine Dean, Materials Research Society (MRS) Gold Medal

2003 Benjamin Bruet, Robert Guenassia Award

2003 Celia Macias, 1st place Poster Presentation Prize: Society of Hispanic Professional Engineers (SHPE) Eastern Technical Career Conference

MIT Service – Current

Sept. 2008 – present Institute Global Studies Council (Reporting to the Provost)

Sept. 2008 – present Middle Eastern Studies Working Group (Reporting to the Associate Provost)

July 2008 – present Chair, MIT Department of Materials Science and Engineering Graduate Program

May 2008 – present Diversity Congress Planning Committee (Reporting to the President)

Sept. 2007 – present Institute Committee on Graduate Programs

Mar. 2007 – present Diversity Initiative Committee (reporting to the Provost)

Jan. 2007 – present Faculty Director of a new MIT International Science and Technology Initiatives international exchange program with Israel (founded the program, 2006-2007)

MIT Service – Past

Jan. 2007 – July 2008 Sesquicentennial (MIT150) Planning Committee (reporting to the President)

Oct. 2007 – Oct. 2007 Panelist "*Why should I go to graduate school?*" informational for MIT undergraduates

Sept. 2007 – Dec. 2007 Department of Materials Science and Engineering Faculty Search Committee

Sept. 2006 – Dec. 2007 Faculty Advisory Board for the Office of Minority Education (reporting to the Chancellor)

Jan. 2007 – May 2007 Search Committee for Dean for Graduate Education (reporting to the Chancellor)

Sept. 2006 – Dec. 2007 Institute Committee on Commencement/Student Marshall

Jan. 2006 – May 2006 Review of the MLK Visiting Professors and Scholars (reporting to the Provost)

Sept. 2006 – May 2007 Departmental Committee on Graduate Studies

Sept. 2006 – May 2007 Graduate Registration Officer, Chair of Bio- and Polymeric Materials

Sept. 2006 – Sept. 2006 Presentation / Panel at MIT New Faculty Orientation on "*Advising Graduate Students*"

Oct. 2006 – Oct. 2006 Panel member for Orientation for new Members of the Corporation on Faculty Life at MIT

Jan. 2005 – Aug. 2005 Faculty Advisory Committee for Minority Education (reporting to the Chancellor)

Jan. 2005 – May 2005 Strategic Planning Education Committee

Sept. 2004 – May 2007 DMSE Undergraduate Adviser

Sept. 2003 – Sept. 2004 Committee on the Future of MITE2S (MIT Minority Introduction to Science and Engineering Summer Program) and Interphase (reporting to the Provost)

May 2003 – May 2005 DMSE Wulff Lecture Organizer

May 2002 – May 2005 DMSE Undergraduate Recruitment Officer

Jan. 2002 – May 2005 Program in Polymer Science and Technology Seminar Series Organizer

Sept. 2000 – May 2001 DMSE Distinguished Lecturer Series Organizing Committee

Feb. 2000 – Dec. 2007 Undergraduate Advisor for the Biomedical Engineering Minor

Sept. 1999 – Dec. 2007 DMSE Undergraduate Committee

Sept. 1999 – May 2002 DMSE Undergraduate Adviser

Sept. 1999 – Sept. 2000 DMSE Subcommittee for Undergraduate Core Curriculum

Diversity

2007-pres. Member; MIT Diversity Initiative Committee

2008 Mentor and Invited Speaker; MIT 3-Day "*Future Faculty Workshop: Diverse Leaders of Tomorrow*"

2008 Admissions and Invited Speaker for MITES (MIT Minority Introduction to Science and Engineering Summer Program)

2008 Invited Participant; "*Advancing and Empowering Scholars: Transforming the Landscape of the American Academy through Faculty Diversity*," symposium at Harvard University (Cambridge, MA)

2007 Invited Speaker; "*Achieving Diversity at the Departmental Level*," MIT Department of Materials Science and Engineering General Faculty Meeting

2007 Invited Speaker and Moderator of Institute-Wide Round Table Presentation; "*Facilitating a Path to and through Graduate School for Underrepresented Minorities*," University of California, Santa Barbara

2007 Invited Banquet Speaker; CONVERGE (graduate preview weekend for underrepresented minority undergraduate students that provide a series of information sessions, workshops, and tours of the MIT campus)

2007 Invited Panelist; National Science Foundation (NSF) / Department of Energy (DOE) / National Institutes of Health (NIH) Workshop on *Achieving Racial & Ethnic Equity in Chemistry* (Arlington, VA)

2007 Departmental Graduate Student Recruitment at SACNAS (Society for Advancement of Chicanos and Native Americans in Science)

2007 Invited Speaker and Admissions for MITES (MIT Minority Introduction to Science and Engineering Summer Program)

2007 Summer Intern Supervisor for MSRP (MIT Minority Summer Research Program)

2007 Invited Speaker at Reception for Underrepresented Minority Students and their Parents. Campus Preview Weekend

2006 Invited Speaker and Departmental Graduate Student Recruitment, SACNAS

- 2006 Invited Speaker and Admissions, MITE2S (MIT Minority Introduction to Science and Engineering Summer Program)
- 2006 Invited Speaker, MSRP (MIT Minority Summer Research Program)
- 2006 Member; MIT Institute Review Committee: Martin Luther King Visiting Scholars Programs
- 2006-2007 Member; Faculty Advisory Committee for the Office of Minority Education
- 2004-2005 Member; MIT Faculty Advisory Committee for Minority Education
- 2003-2004 Member; MIT Institute Committee on the future of MITE2S (MIT Minority Introduction to Science and Engineering Summer Program) and Project Interphase
- 2005 Summer Intern Research Supervisor, MSRP (MIT Minority Summer Research Program)
- 2004 Invited Speaker and Admissions, MITE2S (MIT Minority Introduction to Science and Engineering Summer Program)
- 2003, 2005 "Facilitator" for a group of ~30 freshman leading a discussion of "*Conversations on Race and Ethnicity*"
- 2003 Invited Keynote Speaker, MIT Office of Minority Education Welcome Luncheon for Incoming Minority Student and Families
- 2003 Invited Keynote Speaker, MIT Society of Hispanic Professional Engineers (SHPE) Annual Awards Banquet
- 2000 Invited Speaker, SACNAS

Outreach

- 2008 Advisory board for development of daily animated children's PBS Television series and multimedia project "Wild Kratts", involving the use of animals to explain fundamental science concepts to children ages 6-10 years old
- 2007 Judge for MIT Chapter of the Society of Women Engineers (SWE) annual scholarship applications
- 2007 Museum of Science Guest Speaker (Cambridge, MA)
- 2006 Judge for MIT Chapter of the Society of Women Engineers (SWE) annual scholarship applications
- 2005 Ran Laboratory sessions for high school students: Women in Science and Engineering (WISE)
- 2004 K-6 teacher video project "*Essential Science for Teachers - Physical Science - Session 8 - Extending the Particle Model*" produced by the Harvard-Smithsonian Center for Astrophysics
- 2003 Technical presentation and meeting with MIT Science and Engineering Program for High School Teachers sponsored by the MIT Council on Primary and Secondary Education, Cambridge, MA.

Teaching

- Spring Term 2000 – Spring Term 2007 *Nanomechanics of Materials and Biomaterials* – developed new undergraduate restricted elective course, Lecturer ([Link to a master PDF of all course materials](#))
- Fall Term 2006 – Fall Term 2006 *Mechanics of Materials and Organic and Biomaterials Chemistry* – Laboratory Instructor, organized and managed all undergraduate laboratories for one semester (two courses), which involved 4 teaching assistants, 2 lecturers, 2 laboratory technicians
- Fall Term 1999 – Fall Term 2005 *Mechanics of Materials* – undergraduate core class, Lecturer

Selected Invited Talks (90+ total, 30 international)

- 2009 Society for Experimental Mechanics
- 2005, 2008 Materials Research Society
- 2003, 2007, 2009 American Physical Society
- 6 American Chemical Society (ACS): 2001, 2002(2), 2006(2), 2009

2004 Orthopaedic Research Society

8 Gordon Research Conferences:

2006 Biomineralization
2006 Chemistry at the Interface
2005 Polymers East
2003 Biomaterials Biocompatibility and Tissue Engineering
2002 Proteoglycan
2002 Musculoskeletal Biology and Bioengineering
2002 Science of Adhesion
2001 Elastomer

International:

2008 Technion - Israel Institute of Technology, Haifa, Israel
The Shraga Dirnfeld Lecture
2008 Hebrew University of Jerusalem Jerusalem, Israel
2008 Weizmann Institute of Science Rehovot, Israel
2006 Workshop on "*Autonomic Structural Systems for Threat Mitigation*" sponsored by Air Force Office of Scientific Research (AFOSR) / Army Research Office (ARO) / National Science Foundation (NSF) / Office of Naval Research (ONR) and the European Science Foundation Nice, France
2005 Short course in *Nanomechanics of Materials and Biomaterials*, Facultad de Ciencias Veterinarias, Universidad de Chile Santiago, Chile
2005 Institute of Physics, "*Physics 2005 – A Century after Einstein*," University of Warwick Warwick, UK
2004 University of Toronto, Department of Chemical Engineering and Applied Chemistry Distinguished Lecture Series Toronto, Canada
2004 POLYCHAR- World Forum on Advanced Materials Guimarães, Portugal
2003 Symposium on "*Advances in Bio-Materials*" sponsored by the Brazilian Materials Research Society (MRS) Rio de Janeiro, Brazil
2003 Universidad de Guanajuato, Instituto de Física, Departmental Seminar León Guanajuato, México
2003 XXIII National Congress of The Mexican Society for Surfaces and Vacuum Science, Plenary Lecture and Biomaterials Session Huatulco, México
2003 6th Annual UNESCO (United Nations Educational, Scientific and Cultural Organization) School & IUPAC (International Union of Pure and Applied Chemistry) Conference on Macromolecules & Materials Science Mpumalanga, South Africa
2002 Embrapa Instrumentação Agropecuária, São Carlos São Paulo, Brazil
2002 The Fourth International Symposium on Natural Polymers and Composites São Pedro, Brazil
2002 Technische Hochschule Zürich (ETH), Swiss Federal Institute of Technology, Oberflächentechnik, Laboratory for Surface Science and Technology, Eidgenössische Zurich, Switzerland
2002 Firmenich, Inc. Geneva, Switzerland
2002 Department of Materials Science and Engineering, Cambridge University Cambridge, UK
2002 Department of Physical and Theoretical Chemistry, Oxford University, Soft Matter, Biomaterials, And Interfaces Seminar Series Oxford, UK
2001 University of Laval, Macromolecular Science and Engineering Research Center Quebec City, Quebec, CA

2000	University of Geneva-Switzerland, Department of Analytical and Biophysical, Environmental Chemistry, Analytical and Biophysical, Environmental Chemistry Section	Geneva, Switzerland
2000	Ringberg Workshop: Micro-Nano-Bio: Common Methods and Mechanisms in Materials and Bio Sciences	Munich, Germany
1999	The Dutch Chemical Society (Macromolecules)	Luntern, Netherlands
1998	Conference Nederlands: Recent Developments in Instrumental Analysis	Groningen, Netherlands
1998	6th Annual Dutch Symposium For Scanning Probe Microscopy,	Nijmegen, Netherlands
1998	Max Planck Institute for Polymer Research	Mainz, Germany
1997	Department of Polymer Chemistry, University of Groningen	Groningen, Netherlands
1997	University of Strasbourg, Institute Charles Sadron and LUDFC	Strasbourg, France
1997	Universitaet Ulm, Abteilung Fuer Experimentalle Physik	Ulm, Germany
1997	Universitaet Muenchen, Institut fuer Physikalische Chemie	Muenchen, Germany
1997	Deformation, Fracture, and Rheology of Polymers, Churchill College, Cambridge University	Cambridge, UK
1996	Physics Department, Cavendish Laboratory, University of Cambridge	Cambridge, UK

Publications

93. Lee, H.-Y.; Kopesky, P. W.; Plaas, A. H. K.; Diaz, M. A.; Sandy, J. D.; Kisiday, J. D.; Frisbie, D. D.; **Ortiz**, C.; Grodzinsky, A. J., Adult Equine MSCs Synthesize Aggrecan having Nanomechanical Compressibility and Biochemical Composition Characteristic of Young Growth Cartilage. Submitted, Transactions of the 55th Annual Orthopaedic Research Society, Las Vegas, Nevada, 2009.

92. Lee, H.-Y.; Roughley, P. J.; Grodzinsky, A. J.; **Ortiz**, C., Variations in Single Molecule Human Aggrecan Molecular Structure and Conformation after Removal of Chondroitin Sulfate and Keratan Sulfate. Submitted, Transactions of the 55th Annual Orthopaedic Research Society, Las Vegas, Nevada, 2009.

91. Lee, B.; Hung, H.-H.; Kopesky, P. W.; Vanderploeg, E. J.; Kurz, B.; Frank, E.; Grodzinsky, A. J.; **Ortiz**, C., Mechanical Properties of Stem Cells and their PCM During Chondrogenesis in 3D-Gel Culture. Submitted, Transactions of the 55th Annual Orthopaedic Research Society, Las Vegas, Nevada, 2009.

90. Han, L.; Plaas, A. H. K.; Sandy, J. D.; Frank, E. H.; Hung, H. K.; Anemaet, W. K.; **Ortiz**, C.; Grodzinsky, A. J., Nanomechanics of Murine Knee Joints Reveals Effects of Maturation and Inflammation. Submitted, Transactions of the 55th Annual Orthopaedic Research Society, Las Vegas, Nevada, 2009.

89. Han, L.; Dean, D.; Daher, L. A.; Grodzinsky, A. J.; **Ortiz**, C., Cartilage aggrecan undergoes self-adhesion. In press, 2008.

88. Tai, K.; Pelled, G.; Sheyn, D.; Bershteyn, A.; Han, L.; Kallai, I.; Zilberman, Y.; **Ortiz**, C.; Gazit, D., Nanobiomechanics of repair bone regenerated by genetically modified mesenchymal stem cells. Accepted, Tissue Engineering, 2008.

87. Bruet, B. J. F.; Song, J.; Boyce, M. C.; **Ortiz**, C., Materials design principles of ancient fish armor. Nature Materials 2008, 7, (9), 748-756 [Cover of Issue, September 2008]. [PDF](#) "Fishing for Compliance" commentary by Klaus D. Jandt, Nature Materials 2008, 7, (9), 692-693. [PDF](#)

86. Lee, B.; Han, L.; Frank, E. H.; Chubinskaya, S.; **Ortiz**, C.; Grodzinsky, A. J., Dynamic mechanical properties of growth factor-stimulated chondrocytes after 3D-gel culture. Transactions of the 54th Annual Orthopaedic Research Society, San Francisco, CA, 2008; 33-0151.
85. Han, L.; Greene, J. J.; Frank, E. H.; Hung, H. K.; Grodzinsky, A. J.; **Ortiz**, C., Effect of length scale on frequency-dependent cartilage oscillatory nanomechanics. Transactions of the 54th Annual Orthopaedic Research Society, San Francisco, CA, 2008; 33-0448. Selected as a finalist for the Orthopaedic Research Society's New Investigator Recognition Awards (NIRA).
84. Lee, H.-S.; Kopesky, P.; Daher, L.; Mosquera, A.; Frisbie, D.; Kisiday, J.; Grodzinsky, A.; **Ortiz**, C., Morphology of aggrecan produced by adult equine mesenchymal stem cells and chondrocytes in self-assembling peptide hydrogels. Transactions of the 54th Annual Orthopaedic Research Society, San Francisco, CA, 2008; 33-0553.
83. Lee, H.-S.; Han, L.; Daher, L.; Bonaparte, R.; Roughley, P.; **Ortiz**, C.; Grodzinsky, A., Age-related changes in human aggrecan molecular structure and its nanomechanical properties. Transactions of the 54th Annual Orthopaedic Research Society, San Francisco, CA, 2008; 33-0064.
82. Bruet, B. Multiscale structural and mechanical design of mineralized biocomposites. Ph.D. Thesis, Department of Materials Science and Engineering, Massachusetts Institute of Technology, 2008 (**Ortiz** Supervisor).
81. Ye, M. Reversible stimulus-responsive polymers for the control of the surface interfacial and nanomechanical properties. Ph.D. Thesis, Department of Materials Science and Engineering, Massachusetts Institute of Technology, 2008 (**Ortiz** Supervisor).
80. **Ortiz**, C.; M. C. Boyce, Bioinspired structural materials, Science Vol 319 2008, pg 1053-1054. [PDF](#)
79. Arslan, M.; Boyce, M. C.; Qi, H.-J.; **Ortiz**, C., Constitutive modeling of the stress-stretch behavior of two-dimensional triangulated macromolecular networks containing folded domains. Journal of Applied Mechanics 2008, 75, (1). [PDF](#)
78. Ulm, F.-J.; Vandamme, M.; Bobko, C.; Ortega, J. A.; Tai, K.; **Ortiz**, C., Statistical indentation techniques for hydrated nanocomposites: concrete, bone and shale. Invited review article, Journal of the American Ceramic Society 2007, 90, (9) 2677-2692. [PDF](#)
77. Han, L.; Dean, D.; Mao, P.; **Ortiz**, C.; Grodzinsky, A. J., Nanoscale shear deformation mechanisms of opposing cartilage aggrecan macromolecules. Biophysical Journal 2007, 93: L23-25L. [PDF](#)
76. Tai, K.; Dao, M.; Suresh, S.; Palazoglu, A.; **Ortiz**, C., Nanoscale heterogeneity promotes energy dissipation in bone. Nature Materials 2007, 6, (6) 454-462. [PDF](#) [Supplementary Materials PDF](#)
75. Han, L.; Dean, D.; **Ortiz**, C.; Grodzinsky, A. J., Lateral nanomechanics of cartilage aggrecan macromolecules. Biophysical Journal 2007, 92, (4), 1384-1398. [PDF](#)
74. Pelled, G.; Tai, K.; Sheyn, D.; Zilberman, Y.; Kumbar, S.; Nair, L. S.; Laurencin, C. T.; Gazit, D.; **Ortiz**, C., Structural and nanoindentation studies of stem cell-based tissue engineered bone. Journal of Biomechanics 2007, 40, (2), 399-411. [PDF](#)
73. Ng, L.; Hung, H.-H.; Sprunt, A.; Chubinskaya, S.; **Ortiz**, C.; Grodzinsky, A., Nanomechanical properties of individual chondrocytes and their developing growth factor-stimulated pericellular matrix. Journal of Biomechanics 2007, 40, (5), 1011-1023. [PDF](#) [Supplementary Material PDF](#)
72. Tai, K.; Dao, M.; Suresh, S.; **Ortiz**, C., Nanomechanical heterogeneity as a toughening mechanism in bone. Transactions of the 53rd Orthopaedic Research Society, San Diego, CA, 2007; 32-1358.

71. Tai, K.; Ulm, F.; **Ortiz**, C., Cohesive-frictional plasticity arising from the nanogranular nature in bone. Transactions of the 53rd Orthopaedic Research Society, San Diego, CA, 2007; 32-0314.
70. Lee, B.; Han, L.; Frank, E.; **Ortiz**, C.; Grodzinsky, A, Temporal evolution of viscoelastic properties of individual cartilage chondrocytes and their pericellular matrix *in vitro*. Transactions of the 53rd Orthopaedic Research Society, San Diego, CA, 2007; 32-0149.
69. Tai, K.; Pelled, G.; Bershteyn, A.; Sheyn, D.; Kallai, I.; Zilberman, Y.; **Ortiz**, C.; Gazit, D., Nanobiomechanical analysis of stem cell-based non-union fracture repair. Transactions of the 53rd Orthopaedic Research Society, San Diego, CA, 2007; 32-0128.
68. Han, L.; Greene, J.; Frank, E.; Hung, H.-H.; Grodzinsky, A.; **Ortiz**, C., Nanostructure and time-dependent nanomechanics of bovine cartilage and its Type II collagen network. Transactions of the 53rd Orthopaedic Research Society, San Diego, CA, 2007; 32-0099.
67. Han, L. Nanomechanics of cartilage extracellular matrix macromolecules. Ph.D. Thesis, Department of Materials Science and Engineering, Massachusetts Institute of Technology, 2007 (**Ortiz** Co-supervisor).
66. Choi, J. Nanomechanical properties of hydrated organic thin films. Ph.D. Thesis, Department of Materials Science and Engineering, Massachusetts Institute of Technology, 2007 (**Ortiz** Supervisor).
65. Tai, K. Nanomechanics and ultrastructural studies of cortical bone : Fundamental insights regarding structure-function, mineral-organic force mechanics interactions, and heterogeneity. Ph.D. Thesis, Department of Materials Science and Engineering, Massachusetts Institute of Technology, 2007 (**Ortiz** Supervisor).
64. Tai, K.; Ulm, F. J.; **Ortiz**, C., Nanogranular origins of the strength of bone. Nano Letters 2006, 6, (11), 2520-2525. [PDF](#) Featured in: Nature Nanotechnology News and Views, November 2006, Volume 1 No 2, 99. [PDF](#) Commentary by D. Fyhrie; Featured in: Journal of the American Academy of Orthopaedic Surgeons, 14(4), April 2007. [PDF](#)
63. Oyen, M. L.; Bushby, A. J.; Mann, A.; **Ortiz**, C., Mechanics of biological and biomimetic materials at small length scales. Journal of Materials Research 2006, 21, (8), 1869-1870. [PDF](#)
62. Kearney, C.; Zhao, Z.; Bruet, B. J. F.; Radovitzky, R.; Boyce, M. C.; **Ortiz**, C., Nanoscale anisotropic plastic deformation in single crystal aragonite. Physical Review Letters 2006, 96, (25), 255505. [PDF](#)
61. Qi, H. J.; **Ortiz**, C.; Boyce, M. C., Mechanics of biomacromolecular networks containing folded domains. Journal of Engineering Materials and Technology 2006, 128, (4), 509-518. [PDF](#)
60. Vandiver, J.; Dean, D.; Patel, N.; Botelho, C.; Best, S.; Santos, J. D.; Lopes, M. A.; Bonfield, W.; **Ortiz**, C., Silicon addition to hydroxyapatite increases nanoscale electrostatic, van der Waals, and adhesive interactions. Journal of Biomedical Materials Research: Part A 2006, 78A, (2), 352-363. [PDF](#)
59. Dean, D.; Han, L.; Grodzinsky, A. J.; **Ortiz**, C., Compressive nanomechanics of opposing aggrecan macromolecules. Journal of Biomechanics 2006, 39, (14), 2555-2565. [PDF](#)
58. Han, L.; Dean, D.; Daher, L. A.; Grodzinsky, A. J.; **Ortiz**, C., Shear nanomechanics of opposing cartilage aggrecan via lateral force microscopy. Transactions of the 52nd Orthopaedic Research Society, Chicago, IL, 2006; 31(1011).
57. Ng, L. J.; Chubinskaya, S.; **Ortiz**, C.; Grodzinsky, A. J., Nanomechanical properties of individual chondrocytes and their developing pericellular matrix: Effect of IGF-1 and OP-1. Transactions of the 52nd Orthopaedic Research Society, Chicago IL, 2006; 31(0391).

56. Tai, K.; **Ortiz**, C., Nanoscale intermolecular forces of bovine tibial cortical bone of varying mineral content. Transactions of the 52nd Orthopaedic Research Society, Chicago, IL, 2006; 31(1585).
55. Tai, K.; Pelled, G.; Sheyn, D.; Zilberman, Y.; Gazit, D.; **Ortiz**, C., Nanomechanics of stem-cell based tissue engineered bone. Transactions of the 52nd Orthopaedic Research Society, Chicago, IL, 2006; 31(0103).
54. Tai, K.; **Ortiz**, C. Positionally specific nanoindentation of adult bovine tibial cortical bone of varying mineral contents at the length scale of individual collagen fibrils. Transactions of the 52nd Orthopaedic Research Society, Chicago, IL, 2006; 31(1773).
53. Dean, D.; Han, L.; Daher, L.; Plaas, A. H. K.; **Ortiz**, C.; Grodzinsky, A. J., Nanomechanical properties of aggrecan from bovine fetal epiphyseal and mature nasal cartilage. Transactions of the 52nd Orthopaedic Research Society, Chicago, IL 2006; 31(1012).
52. Han, L.; Dean, D.; Daher, L. A.; Grodzinsky, A. J.; **Ortiz**, C., Biomolecular adhesive interactions between cartilage aggrecan macromolecules. Transactions of the 52nd Orthopaedic Research Society, Chicago, IL, 2006; 31(0361).
51. Villareal, J. Mapping of the elastic modulus and hardness in *Trochus niloticus* seashell nacre by nanoindentation. S.B. Thesis, Department of Materials Science and Engineering, Massachusetts Institute of Technology. 2006 (**Ortiz** Supervisor).
50. Kearney, K. Mechanical behavior of ultrastructural biocomposites. S.M. Thesis. Department of Mechanical Engineering, Massachusetts Institute of Technology. 2006 (**Ortiz** co-Supervisor).
49. Vandiver, J. M. Nanoscale influences on bioactivity : Ultrastructure and nanomechanics of model bioactive hydroxyapatite based biomaterials. Ph.D. Thesis. Department of Materials Science and Engineering, Massachusetts Institute of Technology. 2006 (**Ortiz** Supervisor).
48. Ng, S. S. Rate dependent rupture of solid-supported phospholipid bilayers. S.B. Thesis, Department of Materials Science and Engineering, Massachusetts Institute of Technology. 2005 (**Ortiz** Supervisor).
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