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X. EDWARD GUO

X. Edward Guo
 Professor of Biomedical Engineering
 351 Engineering Terrace
 1210 Amsterdam Avenue, Mail Code: 8904

Phone: +1 212-854-6196

Fax: +1 212-854-8725

Email:

[Home Page](#)



EDUCATION

- 1984: B.S., Applied Mechanics/Biomechanics, Peking University
- 1990: M.S., Mechanical Engineering/Medical Engineering, Harvard University
- 1994: Ph.D., Medical Physics/Medical Engineering, Harvard—MIT Division of Health Sciences and Technology
- 1993-96: Post-doctoral Training in Musculoskeletal Bioengineering, University of Michigan

RESEARCH INTERESTS

- In vivo bone adaptation
- Age-related fractures
- Micromechanics and damage mechanics of bone tissue

PUBLICATIONS

- Guo, X. and Wu, W-Y (1987) The Stokes Flow Produced by An Arbitrary Axisymmetric Oblate Body Moving Perpendicularly Toward An Infinite Flat Wall Along Its Minor Axis, *Acta Scientiarum Naturalium Universitatis Pekinensis*, 1:39-48.
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- Guo, X. E., and Gibson, L. J. (1999) Behavior of Intact and Damaged Honeycombs: A Finite Element Study, *Intl. J. Mech. Eng.*, 41:85-105.
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- Liu, X. S., Sajda, P., Saha, P. K., Wehrli, F. W., and Guo, X. E. (2006) Quantification of the Roles of Trabecular Micro-architecture and Trabecular Type in Determining the Elastic Modulus of Human Trabecular Bone, *Journal of Bone and Mineral Research*, 21(10):1608-1617.
- Guo, X. E., Takai, E., Jiang, X., Xu, Q., Whitesides, G. M., Yardley, J. T., Hung, C. T., Chow, E. M., and Costa, K. D. (2006) Intracellular Calcium Waves in Bone Cell Networks Under Single Cell Nanoindentation, *Molecular & Cellular Biomechanics*, 3(3):95-107.
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- Kim, C. H., X. Henry Zhang, Mikhail, G. von Stechow, D., Müller, R. Han Sung Kim, and Guo, X. E. Effects of Thresholding Techniques on μ CT Image Based Finite Element Models of Trabecular Bone, *ASME Journal of Biomechanical Engineering*. In press, 2006.

PRESENTATIONS (RECENT)

- Erica Takai, Qiaobing Xu, X. Justin Jiang, George M. Whitesides, Kevin D. Costa, James T. Yardley, Clark T. Hung, and X. Edward Guo, Role of Cell Separation Distance on Calcium Signaling in Controlled 2-Dimensional Bone Cell Networks, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.
- X. Lux Lu, X. Edward Guo, Chester Miller, and Van C. Mow, Triphasic Indentation of Articular Cartilage: Determination of Both Mechanical Properties and Fixed Charge Density, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.
- Mandy Ho, Kenneth Ng, Steve Quinnan, Mark Weidenbaum, Gerard Ateshian, X. Edward Guo, and Clark Hung, Cellular Responses of Tissue Engineered Constructs in A Rat-Tail In Vivo Bioreactor, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.
- X. Lux Lu, Chester Miller, X. Edward Guo, and Van C. Mow In Situ Electric Field inside An Indented Articular Cartilage, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.
- Leo Q. Wan, Chester Miller, X. Edward Guo, and Van C Mow, Proteoglycan Swelling and Collagen Stratification Determine The Curling Behavior of Articular Cartilage, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.
- Mei Lin E. Chan, X. Sherry Liu, Brana Vasilic, Felix W. Wehrli, Maria Benito, Peter J. Snyder, and X. Edward Guo, Mechanical and Three-Dimensional Morphological Changes in Tibial Trabecular Bone of

Hypogonadal Patients, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.

- Xiaowei Liu, Angela Huang, Paul Sajda, and X. Edward Guo, Simulating 3D Architectural and Mechanical Changes in Human Trabecular Bone During Menopause, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.
- Xiaowei Liu, Atul Gupta, Grant Bevill, Paul Sajda, Tony Keaveny, and X. Edward Guo, Micromechanical Analyses of Individual Trabeculae in μ CT Based Nonlinear Finite Element Models of Human Vertebral Trabecular Bone, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.
- X. Sherry Liu, Paul Sajda, Punam K. Saha, Felix W. Wehrli, and X. Edward Guo, A 3D Morphological Analysis of Trabecular Bone Based on Individual Trabeculae Segmentation, 52nd Annual Meeting of Orthopaedic Research Society, Lakeside Center, McCormick Place, Chicago, IL, March 19-22, 2006.
- Xiaowei Liu, Angela Huang, Paul Sajda, and X. Edward Guo, Realistic Simulation of 3D Architectural and Mechanical Alterations in Human Trabecular Bone During Menopause, Summer Bioengineering Conference, Amelia Island Plantation, Amelia Island, FL, June 21-25, 2006.
- Xiaowei Liu, Atul Gupta, Grant Bevill, Paul Sajda, Tony Keaveny, and X. Edward Guo, Micromechanical Analyses Of Human Vertebral Trabecular Bone At Individual Trabeculae Level, Summer Bioengineering Conference, Amelia Island Plantation, Amelia Island, FL, June 21-25, 2006.
- X. Lux Lu, Chester Miller, X. Edward Guo, and Van C. Mow, Electric Field inside Articular Cartilage, Summer Bioengineering Conference, Amelia Island Plantation, Amelia Island, FL, June 21-25, 2006.
- X. Lux Lu, Chester Miller, X. Edward Guo, and Van C. Mow, An Algorithm for Triphasic Indentation of Articular Cartilage for Simultaneous Determination of Proteoglycan and Mechanical Property, Summer Bioengineering Conference, Amelia Island Plantation, Amelia Island, FL, June 21-25, 2006.
- Q. Leo Wan, Janine Boumans, Chester Miller, X. Edward Guo, and Van C. Mow, The Role of the Superficial Layer in the Curling and Residual Stress Behaviors of Articular Cartilage, Summer Bioengineering Conference, Amelia Island Plantation, Amelia Island, FL, June 21-25, 2006.
- Morakot Likhitpanichkul, Christina C. Chow, X. Edward Guo, and Van C. Mow, Determination of BPVE Coefficients for Agarose Gels at Various Concentrations from Unconfined Compression, Summer Bioengineering Conference, Amelia Island Plantation, Amelia Island, FL, June 21-25, 2006.
- Q. Leo Wan, Chester Miller, X. Edward Guo, and Van C. Mow An Exact Solution for Charged-Hydrated Biological Tissues under Unconfined Compression: The Triphasic Paradigm, 5th World Congress of Biomechanics, Munich, Germany, July 29–August 4, 2006.
- Morakot Likhitpanichkul, Q. Leo Wan, X. Edward Guo, and Van C. Mow Determination of Tension-Compression Nonlinear Properties and Fixed Charge Density of Articular Cartilage Using A Triphasic, Conewise Linear Elastic Model, 5th World Congress of Biomechanics, Munich, Germany, July 29–August 4, 2006.
- X. Lux Lu, Chester Miller, X. Edward Guo, and Van C. Mow, Triphasic Indentation of Articular Cartilage: The Simultaneous Determination of both Mechanical Properties and Fixed Charge Density, 5th World Congress of Biomechanics, Munich, Germany, July 29–August 4, 2006.
- Erica Takai, Qiaobing Xu, X. Justin Jiang, George M. Whitesides, Kevin D. Costa, James T. Yardley, Clark T. Hung and X. Edward Guo, Bone Cell Network $[Ca^{+2}]_i$ Waves: Novel “Neural” Circuitry?, 5th World Congress of Biomechanics, Munich, Germany, July 29–August 4, 2006.
- Xiaowei Liu, Angela Huang, Paul Sajda, and X. Edward Guo, Simulation of 3D Architectural and Mechanical Changes in Human Trabecular Bone

During Menopause, 5th World Congress of Biomechanics, Munich, Germany, July 29–August 4, 2006.

- X. Edward Guo, Xiaowei Liu, and Paul Sajda, Simulation of 3D Architectural and Mechanical Changes in Human Trabecular Bone During Menopause, Annual Meeting of Biomedical Engineering Society, Chicago, IL, October 11-15, 2006.
- X. H. Zhang, X. Sherry Liu, B. Vasilic, B. F. W. Wehrli, M. Benito, P. J. Snyder, and X. Edward Guo, In Vivo μ MRI Based Finite Element Analyses Detected the Restoration of Mechanical Properties of Tibial Trabecular Bone in Hypogonadal Men after Testosterone Treatment, the 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, February 11-14, 2007.
- Xiaowei S. Liu, Paul Sajda, and X. Edward Guo, Simulating Microstructural and Mineralization Changes during the Treatment of Postmenopausal Osteoporosis by Bisphosphonate, the 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, February 11-14, 2007.
- X. H. Zhang, X. Sherry Liu, Punam K. Saha, Felix W. Wehrli, and X. Edward Guo, Roles of Trabecular Rods in Determining Elastic Moduli of Human Vertebral Trabecular Bone, the 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, February 11-14, 2007.
- W. L. Grayson, S. Bhumiratana, P.-H. G. Chao, C. Cannizzaro, X. S. Liu, X. Edward Guo, A. Caplan, and G. Vunjak-Novakovic, Increased Perfusion Rate and Cell Seeding Density Enhance Tissue Engineering of Human Bone, the 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, February 11-14, 2007.

Bone mechanics, bone adaptation to mechanical loads and its cellular/molecular mechanisms, computational modeling of biological tissues, cellular biomechanics, imaging analysis of bone microstructure, micropatterning of cells.