

# TAB A



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**Jorge A. Ochoa, Ph.D., P.E.**  
**Principal Engineer**

**Professional Profile**

Dr. Jorge A. Ochoa is a Principal Engineer in Exponent's Biomedical Engineering practice. Dr. Ochoa has over 25 years of broad experience in all R&D related areas of new product realization, from concept phase to market readiness. His specific expertise encompasses design of surgical instruments and techniques, as well as biomechanics, engineering biomaterials, and preclinical testing strategy. Dr. Ochoa specializes in the major aspects of medical device specific product development: technology forecasting, design control, risk analysis, biomaterials selection, verification/validation testing, failure analysis and intellectual property issues related to strategy, validity and infringement, post market surveillance, and recalls and forensic failure analysis of medical devices. He has served as an expert witness in product liability cases.

Dr. Ochoa's particular research interests are in the areas of the mechanics of cardiovascular and orthopaedic biological tissues and the tissue/implant interface; medical device durability and wear; kinematics and kinetics of human joints; experimental and finite element analysis used to characterize the mechanical behavior of biological tissues and reconstructive devices for orthopedic, spinal surgery and cardiovascular interventions; coatings for enhanced implant fixation and prevention of implant loosening; image guided surgical techniques, computer aided surgical instruments and telemetric medical devices; intelligent implantable medical devices, biosensors and drug/device combination medical devices.

Prior to joining Exponent, Dr. Ochoa was Chief Technology Officer at Archus Orthopaedics, a privately held medical device start-up company. Before that, he spent 13 years at DePuy Orthopaedics, a division of Johnson & Johnson, in various roles of increasing responsibility within R&D including Vice President of R&D. His activities and responsibilities included new product development; customer needs analysis and support, M&A due diligence and integration, intellectual property analysis, and litigation support. Dr. Ochoa is an Affiliate Associate Professor in the Mechanical Engineering Department at the University of Washington.

**Academic Credentials and Professional Honors**

Ph.D., Mechanical Engineering, Purdue University, 1991  
M.S., Mechanical Engineering, Purdue University, 1987  
Professional Degree, Mechanical Engineering, Missouri University of Science and Technology, 2005  
B.S., Mechanical Engineering, Missouri University of Science and Technology (*cum laude*), 1985

Pi Tau Sigma; Phi Eta Sigma; Distinguished Engineering Alumnus, Purdue University, 2009;  
Best Scientific Paper Awarded by the Spine Arthroplasty Society, 2008; Academy of

Outstanding Mechanical Engineer, Purdue University, 2002; Clinical Biomechanics Best Paper Award, Awarded by European Society of Biomechanics, 1998; Johnson & Johnson Professional Achievement Award, 1995

### **Licenses and Certifications**

Licensed Professional Mechanical Engineer, California, #36186  
Licensed Professional Mechanical Engineer, Massachusetts, #40846  
Licensed Professional Mechanical Engineer, Washington, #40751  
Licensed Professional Mechanical Engineer, New York, #092609

### **Languages**

Spanish

### **Patents**

Patent 8,221,461: Crossbar Spinal Prosthesis Having a Modular Design and Systems for Treating Spinal Pathologies, issued July 17, 2012 (with M.K. Kuiper, D. Yager, L. Tokish, Jr., D.M. Rosler, M.A. Reiley, M.J. Funk, S.L. Rogers, C.R. Ralph, M.T. Charbonneau, R.J. Broman, and T.J. McLeer).

Patents 6,866,685 and 6,660,040: Prosthetic Joints Having Reduced Area Bearing Surfaces and Application Thereof to a Range of Sizes of Prosthetic Joints, issued March 15, 2005 and December 9, 2003 (with F. Chan).

Patent 6,206,929: Bipolar Hip Prosthesis with Locking Head, issued March 27, 2001 (with F. Khalili).

Patent 6,139,584: Proximal Femoral Sleeve for a Revision Hip Prosthesis, issued October, 31, 2000 (with F. Khalili).

Patent 6,019,765: Morsellized Bone Allograft Applicator Device, Issued February 1, 2000 (with T. Thornhill, W.H. Kennefick, and E. Larson).

Patent 5,935,172: Prosthesis With Variable Fit and Strain Distribution, issued August 10, 1999 (with M.J. O'Neil).

Patent 5,871,549: Femoral Stem with Reduced Coefficient of Friction with Respect to Bone Cement, issued February 16, 1999 (with C.M. Jayashankar and F.D. Matthews).

Patents 5,868,747 and 5,716,358: Directional Bone Fixation Device, issued February 9, 1999 and February 10, 1998 (with L.L. Rogers).

Patent 5,871,546: Femoral Component Condyle Design for Knee Prosthesis, issued February 16, 1999 (with D.P. Colleran, S.M. Gabriel, and R.E. Sommerich).

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Patent 5,609,643: Knee Joint Prostheses, issued March 11, 1997(with D.P. Colleran and R.E. Sommerich).

### **Publications**

Farner S, Malkani A, Lau E, Day J, Ochoa J, Ong K. Outcomes and cost of care for patients with distal radius fractures. *Orthopedics* Sep 1 2014; 37(10):e866–878.

Ong KL, Auerbach JD, Lau E, Schmier J, Ochoa JA. Perioperative outcomes, complications, and costs associated with lumbar spinal fusion in older patients with spinal stenosis and spondylolisthesis. *Neurosurg Focus* Jun 2014; 36(6):E5.

Sanders AP, Tibbitts IB, Kakarla D, et al. Contact-coupled impact of slender rods: Analysis and experimental validation. *Experimental Mechanics* 2013/08/10 2013:1–12.

Prisco MR, Ochoa JA, Yardimci AM. Predictions of vacuum loss of evacuated vials from initial air leak rates. *J Pharm Sci* Aug 2013; 102(8):2730–2737.

Lovald ST, Topp SG, Ochoa JA, Gaball CW. Biomechanics of the monopedicle skin flap. *Otolaryngol Head Neck Surg.* Dec 2013;149(6):858-864.

Greenspon AJ, Patel J, Lau E, Ochoa JA, Frisch DE, Ho RT, Pavri BB, Kurtz SM. Trends in permanent pacemaker implantation in the United States 1993–2009: Increasing complexity of patients and procedures. *J Am Coll Cardiol* 2012; 59(13s1):E703–E703.

Sjovold SG, Zhu Q, Bowden A, Larson CR, de Bakker PM, Villarraga ML, Ochoa JA, Rosler DM, Cripton PA. Biomechanical evaluation of the Total Facet Arthroplasty System® (TFAS ®): Loading as compared to a rigid posterior instrumentation system. *Eur Spine J* 2012 Aug; 21(8):1660–1673.

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Gornet MF, Chan FW, Coleman JC, Murrell B, Nockels RP, Taylor BA, Lanman TH, Ochoa JA. Biomechanical assessment of a PEEK rod system for semi-rigid fixation of lumbar fusion constructs. *Journal of Biomechanical Engineering* 2011 Aug; 133(8):081009:1:12.

Greenspon AJ, Patel JD, Lau E, Ochoa JA, Frisch D, Ho RT, Pavri BB, Kurtz SM. Sixteen year trends in the infection burden for pacemakers and implantable cardioverter-defibrillators in the

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Voronov LI, Havey RM, Rosler DM, Sjøvold SG, Rogers SL, Carandang G, Ochoa JA, Yuan H, Webb S, Patwardhan AG. L5 – S1 segmental kinematics after facet arthroplasty. *SAS Journal* 2009; 3(2). <http://sasjournal.com/v2/content/15-%E2%80%93s1-segmental-kinematics-after-facet-arthroplasty>.

Phillips FM, Tzermiadianos MN, Voronov LI, Havey RM, Carandang G, Renner SM, Rosler DM, Ochoa JA, Patwardhan AG. Effect of the Total Facet Arthroplasty System after complete laminectomy-facetectomy on the biomechanics of implanted and adjacent segments. *Spine Journal* 2009 Jan; 9(1):96–102.

Bowden AE, Guerin HL, Villarraga ML, Patwardhan A, Ochoa JA. Quality of motion considerations in numerical analysis of motion restoring implants. *Clinical Biomechanics* 2008 Jun; 23(5):536–544.

Niu Q, Chi X, Leu MC, Ochoa J. Image processing, geometric modeling and data management for development of a virtual bone surgery system. *Journal of Computer Aided Surgery* 2008 Jan; 13(1):30–40.

Komistek RD, Kane T, Mahfouz M, Ochoa JA, Dennis DA. Knee mechanics: A review of past and present techniques to determine in vivo loads. *Journal of Biomechanics* 2005 Feb; 38(2):215–228.

Dennis DA, Komistek RD, Ochoa JA, Haas BD, Hammill C. In vivo comparison of hip separation after metal-on-metal or metal-on-polyethylene THA. *Journal of Bone and Joint Surgery* 2002 Oct; 84(10):1836–1841.

Kurtz SM, Srivastav S, Dwyer K, Ochoa J, Brown S. Analysis of the stem-sleeve interface in a modular titanium alloy femoral component for total hip replacement, in functional biomaterials. *Trans Tech Publications, Switzerland*. Katsube N, Soboyejo WO, Sacks M (eds), pp. 41–68, 2001.

Dennis DA, Komistek RD, Northcut EJ, Ochoa JA, Ritchie A. In vivo determination of hip joint separation and the forces generated due to impact loading conditions. *Journal of Biomechanics* 2001 Apr; 34(5):623–629.

Kurtz SM, Ochoa JA, Hovey CB, White CV. Simulation of initial frontside and backside wear rates in a modular acetabular component with multiple screw holes. *Journal of Biomechanics* 1999 Aug; 32(9):967–976.

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