PRINCIPIA®

Benjamin J. Ewers, Ph.D., P.E.

Principal Engineer

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Experience

Dr. Benjamin Ewers is a Mechanical Engineer and one of the founders of Principia Engineering. His areas of expertise include biomechanics, accident reconstruction and mechanical engineering. Biomechanical analysis focuses on determining accident configuration and severity in order to investigate injury mechanisms and potentials. In conjunction with biomechanics, he performs accident reconstruction and failure analysis to determine the configuration and severity of the accident with particular focus on computer modeling. He also has extensive experience using government crash databases to help understand the injury potential for various accidents.

Prior to working at Principia, Dr. Ewers was a Senior Engineer at Exponent, Inc. (formerly Failure Analysis Associates). He received his doctorate in applied mechanics at Michigan State University where he studied the response of biological tissues to impacts. Notably, he conducted animal and human cadaver studies to investigate the mechanisms of injury to cartilage and subsequent development of osteoarthritis. In conjunction with the in vivo animal studies, he developed a cartilage tissue system for the in vitro study of the effects of mechanical impacts to cartilage metabolism, tissue disruption and cell death.

Education and Credentials

- Ph.D., Applied Mechanics, Michigan State University, 2001
- M.S., Applied Mechanics, Michigan State University, 1997
- B.S., Mechanical Engineering, University of Colorado, 1994
- Registered Professional Mechanical Engineer, California, #M33984
- Phi Kappa Phi, Honor Society
- Co-recipient of The O'Donoghue Award presented by The American Orthopaedic Society for Sports Medicine, 2000
- Co-recipient of 2nd place in Scientific Research competition presented by The Michigan Osteopathic Association, 2000
- Member: Society of Automotive Engineers (SAE)

(Last updated: September 2012)

- Member of the American Society of Mechanical Engineers (ASME)

Continuing Education

- 2000 Stapp Car Crash Conference
- 2003 Stapp Car Crash Conference
- 2004 Seminar titled "Occupant and Vehicle Kinematics in Rollovers"

Publications

"Using HVE to Simulate a Nine Vehicle Accident Involving a Heavy Truck", *Engineering Dynamics Corporation*, HVE Forum, February 2012 (with Eric Rossetter, Bradford Coburn, Yomi Agunbiade)

"Evaluation of Human Surrogate Models for Rollovers," SAE 2005 World Congress, 2005-01-0941, 2005, (with W. Lai, D. Richards, M. Carhart, W. Newberry, C. Ford Corrigan).

"The Extent and Distribution of Cell Death and Matrix Damage in Impacted Chondral Explants Varies with the Presence of Underlying Bone," *Journal of Biomechanical Engineering*, Vol. 125, pp. 114-119, 2003 (with J.A. Kruger, P. Thisse, D. Dvoracek-Driksna, M.W. Orth, and R.C. Haut).

"Impact Orientation Can Significantly Affect the Outcome of a Blunt Impact to the Rabbit Patellofemoral Joint,"*Journal of Biomechanical Engineering*, Vol. 35, pp. 1591-1598, 2002 (with B.T. Weaver, and R.C. Haut).

"Rate of Blunt Impact Affects Changes in Retropatellar Cartilage and Underlying Bone in the Rabbit Patella," *Journal of Biomechanics*, Vol. 35, pp. 747-755, 2002 (with V.M. Jayaraman. R.F. Banglmaier, and R.C. Haut).

"The Extent of Matrix Damage and Chondrocyte Death in Mechanically Traumatized Articular Cartilage Explants Depends on Rate of Loading," *Journal of Orthopaedic Research*, Vol. 19, pp. 779–784, 2001 (with D. Dvoracek-Driksna, M.W. Orth, and R.C. Haut).

"Injuries to the Patellofemoral Joint Resulting from Transarticular Loading are Influenced by Impactor Mass and Velocity," *Journal of Biomechaincal Engineering*, Vol. 123, pp. 293–295, 2001 (with P.J. Atkinson and R.C. Haut).

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"Chronic Changes in Rabbit Retropatellar Cartilage and Subchondral Bone After Blunt Impact Loading of the Patellofemoral Joint," *Journal of Orthopaedic Research*, Vol. 20, pp. 545-550, 2002 (with B.T. Weaver, E.T. Sevensma, and R.C. Haut).

"Tissue Engineered Rotator Cuff Tendon Using Swine Small Intestinal Submucosa: Histological and Mechanical Evaluation in Dogs," *Journal of Sports Medicine*, Vol. 29, pp. 175–184, 2001 (with L.M. Dejardin, S.P. Arnoczky, R.C. Haut, and R.B. Clarke).

"Chronic Softening of Cartilage Without Thickening of Underlying Bone in a Joint Trauma Model," *Journal of Biomechanics*, Vol. 33, pp. 1689–1694, 2000 (with W.N. Newberry and R.C. Haut).

"Polysulphated Glycosaminoglycan Treatments Can Mitigate Decreases in Stiffness of Articular Cartilage in a Traumatized Animal Joint," *Journal of Orthopaedic Research*, Vol. 18, pp. 756–761, 2000 (with R.C. Haut).

"The Effect of Loading Rate on the Degree of Acute Damage and Chronic Conditions in the Knee After Blunt Impact," *Stapp Car Crash Journal*, Vol. 44, pp. 299–314, 2000 (with V.M. Jayaraman, R.F. Banglmaier, and R.C. Haut).

"The Tensile and Stress Relaxation Responses of Human Patellar Tendon Varies with Specimen Cross-Sectional Area,"*Journal of Biomechanics*, Vol. 32, pp. 907–914, 1999 (with T.S. Atkinson and R.C. Haut).

"Thigmomorphogenesis: Changes In the Morphology and Mechanical Properties of Two Populus Hybrids," *Tree Physiology*, Vol. 20, pp. 535–540, 2000 (with M.L. Pruyn and F.W. Telewski).

Presentations

"Computer Modeling for Vehicle Accident Reconstruction", The State Bar of California approved MCLE

- Presented at Jenkins, Goodman, Neuman & Hamilton, July 14, 2010
- Presented at Law Offices of McDowell, Meshot & Shaw, March 26, 2008
- Presented at Crosby & Rowell, LLP, March 14, 2007
- Presented at Kern, Noda, Devine & Segal, August 4, 2006

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