

Stacy M. Imler, Ph.D., P.E.
Managing Engineer

Professional Profile

Dr. Stacy M. Imler is a Managing Engineer in Exponent's Biomechanics practice. Dr. Imler addresses issues related to the biomechanics of human injury, with expertise in the areas of human tolerance, occupant kinematics, and rigid body dynamics. Her work includes analysis of injuries associated with transportation, industrial equipment, heavy equipment, falls, and consumer products. Dr. Imler's experience includes biomechanical reconstruction of automotive accidents (e.g., rollover accidents, planar collisions, as well as low-speed collisions), evaluating forklift operator injury potential, biomechanical analysis of fall related injuries, and pedestrian accident reconstruction. Her research efforts in rollover include evaluation of ejection mitigation technologies (i.e., rollover-activated side curtain airbags) in the context of occupant containment and injury potential. Additional research includes evaluation of motor vehicle crash field accident data to determine injury risk in specific crash modes for particular population groups (e.g., by age, stature, restraint status, etc.).

Prior to joining Exponent, Dr. Imler was a Graduate Research Assistant at the Soft Tissue Biomechanics Laboratory at Georgia Tech in Atlanta, Georgia, where her research activities included studies in soft tissue biomechanics, particularly fibrocartilage and articular cartilage, and the biosynthetic effects of external mechanical stimuli, including injurious as well as physiological loading on orthopaedic soft tissues. She has technical experience in design and development of devices to implement external mechanical stimuli, as well as experience in mechanical testing, tissue engineering, and biological assays.

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, Georgia Institute of Technology, 2005
M.S., Mechanical Engineering, Georgia Institute of Technology, 2001
B.S.M.E., Mechanical Engineering, Lehigh University (*summa cum laude*), 1998

National Science Foundation Graduate Research Fellowship; Clare Boothe Luce Fellowship; Georgia Tech President's Fellowship; Medtronic Fellowship; Iacocca Scholar; GTE Academic All-American; Phi Kappa Beta; Pi Tau Sigma; Tau Beta Pi

Licenses and Certifications

Registered Professional Engineer, Georgia, #PE036575
Registered Professional Engineer, Pennsylvania, #PE076461
Registered Professional Engineer, Mississippi, #20378LTD
Certified XL Tribometrist (CXLT) using English XL VIT

Additional Training

Laminated Glass: Design Considerations for Vehicle Door Systems Fast Track, Society of Automotive Engineers (SAE) course, 2011

Traffic Accident Reconstruction, Northwestern University Center for Public Safety, 2008

Publications

Imler SM, Heller MF, Zhao K, Watson HN, Corrigan CF. The effect of side impact collision delta-V, restraint status, and occupant position on injury outcome. Society of Automotive Engineers (SAE) Technical Paper 2010-01-1158, 2010.

Heller MF, Imler SM, Zhao K, Watson HN, Corrigan CF. The effect of frontal collision delta-V and restraint status on injury outcome. Society of Automotive Engineers (SAE) Technical Paper 2010-01-0145, 2010.

Mouw JK, Imler SM, Levenston ME. Ion-channel regulation of chondrocyte matrix synthesis in 3D culture under static and dynamic compression. *Biomechanics and Modeling in Mechanobiology* 2007; 6(1–2):33–41.

Imler SM. In vitro modulation of meniscus biosynthesis: A basis for understanding cellular response to physiologically relevant stimuli. Doctoral Dissertation, Georgia Institute of Technology, 2005.

Vanderploeg EJ, Imler SM, Brodtkin KR, García AJ, Levenston ME. Oscillatory tension differentially modulates matrix metabolism and cytoskeletal organization in chondrocytes and fibrochondrocytes. *Journal of Biomechanics* 2004; 37(12):1941–1952.

Imler SM, Doshi AN, Levenston ME. Combined effects of growth factors and static mechanical compression on meniscus explant biosynthesis. *Osteoarthritis Cartilage* 2004; 12(9):736–744.

Hunter CJ, Imler SM, Malaviya P, Nerem RM, Levenston ME. Mechanical compression alters gene expression and extracellular matrix synthesis by chondrocytes cultured in collagen I gels. *Biomaterials* 2002; 23(4):1249–1259.

Presentations and Published Abstracts

Imler SM, Levenston ME. Biosynthetic differences in chondrocyte and fibrochondrocyte behavior in agarose. *Transactions of the Orthopaedic Research Society* 2006; 31:1045.

Imler SM, Vanderploeg EJ, Levenston ME. Differential behavior of fibrochondrocytes from distinct regions of the meniscus. *Transactions of the Orthopaedic Research Society* 2005; 30:1497.

Imler SM, Wilson CG, Levenston ME. IL-1 induces rapid loss of matrix constituents and material properties from meniscal fibrocartilage. Transactions of the Orthopaedic Research Society 2005; 30:1705.

Mouw JK, Connelly JT, Imler SM, Levenston ME. TGF- β 1 and dynamic compression influence the chondrogenesis of bovine bone marrow stromal cells. Transactions of the Orthopaedic Research Society 2005; 30:0095.

Imler SM, Doshi AN, Levenston ME. Effects of anabolic cytokines and static compression on meniscus tissue explants. Transactions of the Orthopaedic Research Society 2004; 29:0663.

Mouw JK, Imler SM, Levenston ME. Influence of ion channel inhibitors on the chondrocyte response to cyclic compression. Transactions of the Orthopaedic Research Society 2004; 29:0817.

Mouw JK, Imler SM, Levenston ME. Ion-channel dependent regulation of chondrocyte matrix synthesis in 3D culture under dynamic and static compression. Transactions of the ASME 2003 Summer Bioengineering Conference 2003; 191–192.

Vanderploeg EJ, Imler SM, Brodtkin KR, García AJ, Levenston ME. Oscillatory tension induces cytoskeletal reorganization in chondrocytes. Transactions of the Orthopaedic Research Society 2003; 28:0039.

Imler SM, Vanderploeg EJ, Hunter CJ, Levenston ME. IGF-1 stimulation of meniscal biosynthesis. Transactions of the Orthopaedic Research Society 2002; 27:0366.

Imler SM, Hunter CJ, Vanderploeg EJ, Levenston ME. Matrix biosynthesis due to exogenous stimuli differs for cartilage and fibrocartilage. Proceedings, World Congress of Biomechanics, 2002.

Vanderploeg EJ, Imler SM, Brodtkin KR, Levenston ME. Chondrocytes and fibrochondrocytes respond differently to oscillatory tension. Proceedings, World Congress of Biomechanics, 2002.

Imler SM, Hunter CJ, Levenston ME. Cryopreservation does not impair chondrocyte response to growth factor stimuli. Biomedical Engineering Society Annual Fall Meeting, 2001.

Imler SM, Levenston ME. IGF-1 stimulated production of matrix components in meniscal explants. Biomedical Engineering Society Annual Fall Meeting, 2001.

Vanderploeg EJ, Imler SM, Hunter CJ, Levenston ME. Oscillatory tension modulated chondrocyte proliferation, biosynthesis and morphology. Biomedical Engineering Society Annual Fall Meeting, 2001.

Imler SM, Vanderploeg EJ, Hunter CJ, Levenston ME. Static and oscillatory compression modulate protein and proteoglycan synthesis by meniscal fibrochondrocytes. Transactions of the Orthopaedic Research Society 2001; 26:0552.

Imler SM, Vanderploeg EJ, Hunter CJ, Levenston ME. Mechanical compression modulates matrix synthesis in meniscal tissue and gels. *Tissue Engineering* 2000; 6(6):O-181.

Professional Affiliations

- Society of Automotive Engineers (member)

Peer Reviewer

- Society of Automotive Engineers