

## **Vivek Shekhawat, Ph.D.**

### **Professional Profile**

Vivek Shekhawat specializes in accident reconstruction and biomedical engineering. His focus is on resolving accident scenarios and injury-biomechanics associated with industrial, recreational, and transportation fields. Dr. Shekhawat analyzes injury-severity and injury causation potential in various accident situations, including falls, traffic collisions, altercations, and excessive static and dynamic joint-loading. His research work has also focused on the load-bearing ability of healthy and injured joints.

Dr. Shekhawat has experience in reconstructing accidents using computer simulations, experimental models, and theoretical and numerical analyses. His graduate coursework included biomechanics, biomaterials, bioinstrumentation, biostatistics, mechanics of the human spine, engineering analysis, mechanical vibrations, computer integrated manufacturing, advanced mechanics of solids, robotics and mechatronics, manufacture engineering, forging and forming, thermodynamics, fluid power, and energy conversion.

Prior to InSciTech, Dr. Shekhawat worked as a post-doctoral research fellow at Rush University Medical Center, Chicago and also interned at Endolab GmbH, Germany.

### **Credentials and Professional Affiliations**

Ph.D. (Bioengineering), University of Illinois at Chicago, 2009

M.S. (Mechanical Engineering), Illinois Institute of Technology, 2002

B.E. (Mechanical Engineering), Nagpur University, 1997

Member, Orthopedic Research Society, 2009

Honorable mention, Graduate Student Research Forum, UIC Chicago 2008

## **Publications and Presentations**

“Surface Topography of Viable Articular Cartilage Measured with Scanning White Light Interferometry”, *Osteoarthritis and Cartilage*, 17:1197-1203, 2009 (with M.A. Wimmer)

“Influence of Kinematics on Mechano-Biological Response of Articular Cartilage – An in vitro Investigation”, Ph.D. Thesis, University of Illinois at Chicago, 2009

“Effect of Articular Motion in Evaluating Biosynthetic and Functional Response of Traumatized Human Cartilage”, Orthopedic Research Society, 2009 (with M.A. Wimmer)

“Joint Kinematics Influence the Homeostasis of Traumatized Human Articular Cartilage: An in vitro Investigation”, MidWest Connective Tissue Workshop, 2009 (with M.A. Wimmer)

“In Vitro Wear Testing of Living Cartilage Tissue”, Orthopedic Research Society, 2008 (with M.A. Wimmer)

“Migrating the Articular Motion Over Cartilage Surface Improves Explant Cell Viability”, Orthopedic Research Society, 2008 (with M.A. Wimmer)

“Surface Topography of Viable Articular Cartilage Explants Varies With Location – Study Using White Light Interferometry”, Orthopedic Research Society, 2008 (with M.A. Wimmer)

“Characterizing the Surface Topography of Viable Cartilage Explants – A Novel Application Using Scanning White Light Interferometer”, Summer Bioengineering Conference, ASME, 2008 (with M.A. Wimmer)

“Increase in Superficial Zone Protein Synthesis of Cartilage by Articular Simulation with Migrating Contact”, 7th World Congress, International Cartilage Research Society, 2007 (with M.A. Wimmer)

“Cellular Responses in Acute Trauma of Human Ankle Cartilage: Cell Survival, Catabolic Cytokines and Neuromediators”, 7th World Congress, International Cartilage Research Society, 2007 (with T. Wilson)

**Publications** (*continued*)

“Joint Articulation Increases Proteoglycan Release from Cartilage in the Presence of IL1-Beta”, 7th World Congress, International Cartilage Research Society, 2007 (with C. Pacione)

“Catabolic and Anabolic Events Characteristic for Acute Trauma in Human Cartilage”, Orthopedic Research Society, 2007 (with S.C. Chubinskaya)

“Effect of Articular Motion on Cartilage-Bone Explants”, Orthopedic Research Society, 2006 (with M.A. Wimmer)

“One-Step-Insertion Technique for Osteochondral Transplantation: An Alternative Over Tapping?”, 5th World Congress of Biomechanics, 2006 (with M.A. Wimmer) “Water Jet Cutting - An Alternative Method for Cutting Cartilage”, 5th World Congress of Biomechanics, 2006 (with M. Honl)

“Computer Simulation of Gas Carburizing: An Investigation of the Effect of Accurate Carbon Diffusion Coefficient”, 22nd Heat Treating Society Conference, ASM International, American Society of Materials International, 2002 (with R.P. Foley)

“Simulation of Gas Carburizing: Development of a Computer Program With Systematic Analysis of Process Variables Involved”, 22nd Heat Treating Society Conference, ASM International, American Society of Materials International, 2002 (with M. Thete)