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Soroush Assari, Ph.D.

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Professional Profile

Dr. Assari is a biomechanics expert with a special focus on injury biomechanics. Leveraging his multidisciplinary background, education, and research in injury biomechanics, mechanical engineering, and biomedical devices, he addresses issues related to motor vehicle collisions, premises liability events, and incidents that result in traumatic brain injury. He adeptly evaluates kinematics and injury mechanisms, and carefully scrutinizes possible biomechanical and mechanical factors that may have contributed to the injury.

Prior to joining Exponent, Dr. Assari was a postdoctoral fellow, lab manager and adjunct faculty member at Temple University college of Engineering, Department of Mechanical Engineering. During his time at the Temple Biomechanics Laboratory, Dr. Assari conducted pioneering research on traumatic brain injury (TBI) caused by head acceleration, blunt impact, or blast wave exposure. He also has over four years of research experience in thoracic blunt impact trauma, with a particular focus on behind armor blunt trauma (BABT).

Dr. Assari has extensive experience designing and conducting in vivo large and small animal testing in the field of injury biomechanics, instrumentation and sensor design, high-speed data acquisition (including high-speed stereo imaging), tissue material characterization, and injury mechanism analysis. He has also worked with human test subjects, instrumentation to analyze head kinematics in football players and BMX riders for concussion assessment, as well as post-mortem human tissue for orthopedic implant failure research.

His scientific publications include 15 peer-reviewed journal publications with over 300 citations, and more than 15 conference proceedings and presentations. He was awarded an American Heart/Stroke Association fellowship and received a Certificate of Research Excellence from the American Heart/Stroke Association in 2017.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, Temple University, 2017

M.Sc., Mechanical Engineering, Temple University, 2012

B.Sc., Mechanical Engineering, University of Tehran, Iran, 2003

Certificate of Research Excellence - American Heart/Stroke Association (2017)

Awarded American Heart Association Fellowship (2015-2017)

Featured Poster Award - Orthopedic Research Society Annual Meeting (2012)

Best Poster Award - American Association for Hand Surgery (2011)

Prior Experience

Postdoctoral Fellow, Lab Manager, Temple University Biomechanics Lab. (2017-2022)

Adjunct Faculty, Temple University, Mechanical Engineering Department, (2017-2021)

Graduate Research Assistant, Temple University Biomechanics Lab. (2010-2017)

Senior Mechanical Design Engineer, Tarh Negasht Co., (2004-2009)

Mechanical Design Engineer, Tarsam Co., (2003-2004)

Languages

Farsi

Publications

Peer-reviewed Journal Publications:

Barbe MF, Amin M, Harris MY, Panibatla ST, Assari S, Popoff SN, Bove GM. Manual Therapy Facilitates Homeostatic Adaptation to Bone Microstructural Declines Induced by a Rat Model of Repetitive Forceful Task. Int J Mol Sci. 2022 Jun 13;23(12).

Barbe MF, Hilliard BA, Delany SP, Iannarone VJ, Harris MY, Amin M, Cruz GE, Barreto-Cruz Y, Tran N, Day EP, Hobson LJ, Assari S, Popoff SN. Blocking CCN2 Reduces Progression of Sensorimotor Declines and Fibrosis in a Rat Model of Chronic Repetitive Overuse. J Orthop Res. 2019 Sep;37(9).

Barbe MF, Massicotte VS, Assari S, Monroy MA, Frara N, Harris MY, Amin M, King T, Cruz GE, Popoff SN. Prolonged High Force High Repetition Pulling Induces Osteocyte Apoptosis and Trabecular Bone Loss in Distal Radius, While Low Force High Repetition Pulling Induces Bone Anabolism. Bone. 2018 May;110.

Reilly M, Darvish K, Assari S, Cole J, Wilps T, Gokcen E. Evaluating the Subtalar Joint in Tibiotalocalcaneal Nail. FAO. 2018;3(3).

Reilly M, Darvish K, Assari S, Cole J, Gokcen E. Plantar Plate Reconstruction for Stage IV Plantar Plate Tear Using Flexor Tendon Tenodesis. FAO. 2018 Sep 14;3(3).

Rastgar Agah M, Laksari K, Assari S, Darvish K. Mechanical Behavior of Porcine Thoracic Aorta in Physiological and Supra-Physiological Intraluminal Pressures. Proc Inst Mech Eng H. 2017 Apr;231(4).

Kermani G, Hemmasizadeh A, Assari S, Autieri M, Darvish K. Investigation of Inhomogeneous and Anisotropic Material Behavior of Porcine Thoracic Aorta Using Nano-Indentation Tests. J Mech Behav Biomed Mater. 2017 May;69.

Tyburski AL, Cheng L, Assari S, Darvish K, Elliott MB. Frequent Mild Head Injury Promotes Trigeminal Sensitivity Concomitant with Microglial Proliferation, Astrocytosis, and Increased Neuropeptide Levels in the Trigeminal Pain System. J Headache Pain. 2017 Dec;18(1).

Kawata K, Rubin LH, Lee JH, Sim T, Takahagi M, Szwanki V, Bellamy A, Darvish K, Assari S, Henderer

JD, Tierney R, Langford D. Association of Football Subconcussive Head Impacts with Ocular Near Point of Convergence. JAMA Ophthalmol. 2016 Jul 1;134(7).

Rastgar-Agah M, Laksari K, Assari S, Darvish K. Mechanical Instability of Aorta due to Intraluminal Pressure. Int J Appl Mech. 2016 Feb 18;8(01).

Laksari K, Assari S, Seibold B, Sadeghipour K, Darvish K. Computational Simulation of the Mechanical Response of Brain Tissue Under Blast Loading. Biomech Model Mechanobiol. 2015 Jun;14(3).

Hemmasizadeh A, Tsamis A, Cheheltani R, Assari S, D'Amore A, Autieri M, Kiani MF, Pleshko N, Wagner WR, Watkins SC, Vorp D, Darvish K. Correlations Between Transmural Mechanical and Morphological Properties in Porcine Thoracic Descending Aorta. J Mech Behav Biomed Mater. 2015 Jul;47.

Assari S, Kaufmann A, Darvish K, Park J, Haw J, Safadi F, Rehman S. Biomechanical Comparison of Locked Plating and Spiral Blade Retrograde Nailing of Supracondylar Femur Fractures. Injury. 2013 Oct;44(10).

Assari S, Darvish K, Ilyas AM. Biomechanical Analysis of Second-Generation Headless Compression Screws. Injury. 2012 Jul;43(7).

Datla NV, Koo JY, Choi DJ, Assari S, Hemmasizadeh A, Podder TK, Yu Y, Dicker AP, Darvish K, Hutapea P. Mechanical Characterization of Polyacrylamide for Prostate Tissue-Mimicking Phantoms. J Med Device. 2012 Mar 1;6(1).

Selected Conference Proceedings, Abstracts and Presentations:

Assari S, Darvish K. Brain Tissue Material and Damage Properties for Blast Trauma. ASME, IMECE. 2018; IMECE2018-88419, V003T04A069.

Barbe MF, Massicotte VS, Assari S, Frara N, Harris MY, Amin M, King T, Cruz GE, Popoff SN. Prolonged High Force High Repetition Pulling Induces Trabecular Bone Loss and Microcracks, While Low Force High Repetition Pulling Induces Bone Anabolism. Proc. Hum. Factors Ergon. Soc. Annu. Meet. 2018.

Assari S, Darvish K. Characterization of Brain Tissue under High Rate Shear Loading: A Novel Test Method with Low Noise. IBS-IBRC. 2017.

Kermani G, Assari S, Hemmasizadeh A, Darvish K. Characterizing the Inhomogeneity of Aorta Mechanical Properties and its Effect on the Prediction of Injury. IBS-IBRC. 2016.

Rastgar-Agah M, Assari S, Rachev A, Darvish K. High Rate Failure Properties of Aortic Tissue. IBS-IBRC. 2014.

Assari S, Laksari K, Barbe M, Darvish K. Cerebral Blood Pressure Rise During Blast Exposure in a Rat Model of Blast-Induced Traumatic Brain Injury. ASME, IMECE. 2013 Nov; IMECE2013-64992, V03AT03A016.

Hemmasizadeh A, Cheheltani R, Assari S, Pleshko N, Darvish K. Spatial Variation in Aorta Composition and Correlation with Mechanical Properties. IEEE, 39th NEBEC. 2013.

Laksari K, Assari S, Darvish K. Computational Comparison of Shock Wave Propagation in Explosive Blast and Shock Tube Experiments. ASME, IMECE. 2013. IMECE2013-65073, V03AT03A072.

Laksari K, Assari S, Darvish K. Computational Simulation of Shock Tube and the Effect of Shock Thickness on Strain-Rates. IEEE, 39th NEBEC. 2013.

Assari S, Kaufman A, Darvish K, Rehman S, Park J, Haw J, Safadi F. Locked Plating Versus Spiral Blade

Retrograde Nailing in Supracondylar Femoral Fractures. ASME, SBC. 2012.

Assari S, Kaufmann A, Darvish K, Rehman S, Park J, Haw J, Safadi F. Supracondylar Femoral Fracture Fixation: Locked Plating Versus Retrograde Nailing. IEEE, 38th NEBEC. 2012.

Hemmasizadeh A, Assari S, Darvish K, Autieri M. Multilayer Quasi-Linear Viscoelastic Characterization of Porcine Aorta Using Nanoindentation. IBS-IBRC. 2012.

Assari S, Darvish K, Ilyas AM. A Biomechanical Study of Scaphoid Headless Screws. ASME, SBC. 2011.

Laksari K, Assari S, Darvish K. Modeling Linear Head Impact and the Effect of Brain-Skull Interface. 26th SBEC. 2010.

Romanov V, Assari S, Laksari K, Darvish K. Pressure oscillation tests of porcine aorta. ASME, SBC. 2010.

Romanov VV, Darvish K, Assari S. Characterization of Material Properties of Aorta from Oscillatory Pressure Tests. 26th SBEC. 2010.

Peer Reviews

Journal of Frontiers in Bioengineering and Biotechnology

Journal of Biomechanics and Modeling in Mechanobiology

Journal of Engineering in Medicine

Journal of Neurotrauma