

Jonathan B. Estrada

Curriculum Vitae

March 2016

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Education

2017 (est.)	Ph.D. candidate, Solid Mechanics, Brown University
2013	Sc.M., Solid Mechanics, Brown University
2011	B.S., Materials Science and Engineering, Massachusetts Institute of Technology

Refereed Journal Publications

Estrada JB, Bar-Kochba E, Stout DA, Toyjanova J, Kesari H, Reichner J, Franck C. “Mean deformation metrics for quantifying 3D cell-matrix interactions in the absence of material properties” *PNAS* 113 (11), 2016

Poellmann MJ, **Estrada JB**, Boudou T, Berent ZT, Franck C, Wagoner-Johnson AJ. “Differences in morphology and traction generation of cell lines representing different stages of osteogenesis” *J Biomech Eng* 137 (12), 2015

Estrada JB, Franck C. “Intuitive interface for the quantitative evaluation of speckle patterns for use in digital image and volume correlation techniques” *J Appl Mech* 82 (9), 2015

Papers in Preparation

Bar-Kochba E, Scimone MT, **Estrada, JB**, Franck, C. “Strain and Rate-dependent Diffuse Axonal Injury Pathomorphology of 3D Neuron Cultures Under Compression”

Conference Proceedings

(1 = talk, 2 = poster)

Bar-Kochba E, Scimone MT, **Estrada JB**, Franck C² “Strain and Rate-dependent Neuronal Injury in a 3D in-vitro Model of Traumatic Brain Injury”. Biophysical Society, Feb 2016

Estrada JB², Scimone MT, Landauer AK, Franck C “Investigation of Microcavitation as a Neuronal Damage Mechanism in Blast Traumatic Brain Injury”. Biophysical Society, Feb 2016

Estrada JB, Franck C¹ “Microcavitation as a Neuronal Damage Mechanism in Blast Traumatic Brain Injury”. Applied Physics Society Meeting, Division of Fluid Mechanics, Nov 2015

Estrada JB¹, Scimone MT, Franck C “Investigation of Microcavitation as a Neuronal Damage Mechanism in Blast Traumatic Brain Injury”. Society of Engineering Science, Oct 2015

Estrada JB¹, Landauer AK, Franck C “Red-Blue Diffraction Assisted Image Correlation for High-Speed Imaging”. Society of Engineering Science, Oct 2015

Scimone MT¹, Levine A, **Estrada JB**, Bar-Kochba E, Franck C, “Investigating the Neuroprotective Effects of Hypothermia as a Potential Therapeutic for Traumatic Brain Injuries using a 3D Neuronal Cell Model”. Society for Engineering Science, Oct 2015

Estrada JB¹, Franck C “Investigation of Microcavitation as a Neuronal Damage Mechanism in Blast Traumatic Brain Injury”. Society of Engineering Science, Oct 2014

Estrada JB¹, Oh C, Bar-Kochba E, Lopez-Fagundo C, Livi L, Hoffman-Kim D, Franck C. “3D Traction Forces of Schwann Cells on Compliant Patterned Substrates”. Society of Engineering Science, Oct 2014

Estrada JB¹, Bar-Kochba E, Franck C. “Determining a Failure Strain Envelope for Neurons in Uniaxial Compression”. Society of Engineering Science, Jul 2013

Awards

2014-15, 2015-16	Jacob K. Javits (GAANN) Fellowship
2012, 2013	NSF Graduate Research Fellowships Program Honorable Mention
2012	Award for Excellence, Graduate School, Brown University
2012	E. Paul Sorensen Graduate Fellowship in Engineering, Brown University
2011	Sigma Xi Honor Society

Teaching Experience

Brown University

Graduate

Experimental Mechanics, TA/Lab Designer (Sp '13, Sp '15)

Undergraduate

Introduction to Engineering, TA (Fa '15)

Dynamics and Vibrations, TA (Sp '14)

Mechanics of Solids and Structures, TA/Lab Designer (Fa '13, Fa '14)

Biomechanics, TA (Fa '12)

High School

Introduction to Engineering, Lincoln School for Girls, Instr. of Record (Sp '16)

Mechanics of Materials and Catapult Engineering, Summer@Brown, Instr. of Record (Su '15, '16)

Introduction to Engineering, Summer@Brown, Instr. of Record (Su '15, '16)

Do you want to be an Engineer?, Summer@Brown, Instr. of Record (Su '13, '14)

Massachusetts Institute of Technology

Undergraduate

Introduction to Solid State Chemistry, edX platform (online), Moderator (Fa '12, Sp '13)

Introduction to Solid State Chemistry, Section Leader (Fa '10, Sp '11)

Research Experience

Dissertation work involves primary cortical harvest to produce 3D collagen in vitro neuronal cultures. Microcavitation induced by high-energy pulsed laser and uniaxial impact induced by a mechanical linear voice coil actuator are considered as modes simulating traumatic brain injury. Cellular health and physiological function are quantified over time for different strain, strain rate parameters. Red-blue high-speed diffraction-assisted image correlation technique developed in conjunction with inverted microscope to discern three-dimensional displacement fields from 2D images.

Community Outreach

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| 2015-2016 | Weekly Seminar Founder/Organizer, Continua Research Society (Solids, Fluids, and Materials student seminar group) |
| 2015-2016 | Brown University Chorus President |
| 2013 | Invited Speaker, Biophysical Journal Club, "Neuronal Damage as a Result of Induced Microcavitation" |
| 2011 | Invited International Baccalaureate Seminar Speaker, "The Material Edge: Interdisciplinary Design for Our Future", Northport High School |