

CODY M. O'CAIN

Senior Engineer, Biocore LLC

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EDUCATION	M.S., Mechanical & Aerospace Engineering December 2019
	University of Virginia, Charlottesville, VA Thesis: "Lisfranc Injury: A Mechanism, Tolerance, and Model Development"
	B.S., Biomedical Engineering May 2017
	Tulane University, New Orleans, LA Thesis: "Biomechanical Roles of Glycosaminoglycan Clusters in Tendon Homeostasis"

EXPERIENCE	Senior Engineer March 2020 – Present
	Biocore LLC, Charlottesville, VA
	<ul style="list-style-type: none">▪ Engineer for lower extremity, turf, and player performance research▪ Focusing on identifying on-field mechanism of lower extremity injuries in NFL athletes to guide countermeasures, equipment design, and facilitate research to improve player health and safety
	Graduate Research Assistant August 2017 – December 2019
	University of Virginia, Charlottesville, VA
	<ul style="list-style-type: none">▪ Managed and executed several independent research projects▪ Identified injury mechanism and tolerance for midfoot injury through cadaveric testing and finite element modeling▪ Developed methodology to automate the creation of specimen-specific lower extremity finite element models to investigate the effects of structural variation of the midfoot▪ Evaluated the effect of variation in ligament stiffness on midfoot injury tolerance▪ Evaluated sensitivity of different methods for syndesmotic fixation on ankle response with the use of a lower extremity finite element model▪ Aided with the mechanical characterization of cadaveric ankles with and without total ankle replacements on a gait simulator
	Research Assistant January 2015 – June 2017
Tulane University, New Orleans, LA	
<ul style="list-style-type: none">▪ Developed finite element modeled of glycosaminoglycan increase on local tissue level during tendon overuse	
Biomedical Division Intern May – August 2016	
Veteran Affairs Hospital, New Orleans, LA	
<ul style="list-style-type: none">▪ Managed government budget to instrument the new dental wing of hospital▪ Discussed with vendors and veterans to procure equipment that best fit needs	
Workshop Technician October 2015 – June 2017	
Scot Ackerman MakerSpace, New Orleans, LA	
<ul style="list-style-type: none">▪ Supervised and taught students about additive and subtractive manufacturing techniques	

SKILLS

- FEA (Ls-dyna, Altair HyperWorks)
- CAD (SOLIDWORKS, Autodesk Inventor)
- Programming (MathWorks MATLAB, TCL)
- Motion Capture (Vicon Nexus)
- Data Collection (DTS SLICEWare)
- Segmentation (Materialise Mimics, Materialise 3-Matic)
- Additive and Subtractive Manufacturing (3D Printing, CNC Machining)

AWARDS

- USNCCM15 Travel Award 2019
- IRCOBI Europe Travel Award 2018
- James A. Cronvich Award, 2017
- Kenneth H. Kuhn Sr. Memorial Award, 2017
- Oscar Lee Putnam Cultural and Enrichment Grant, 2016
- Tulane Leadership Scholarship, 2013 - 2016
- Texas Ladies Auxiliary Scholarship, 2013 - 2016

PUBLICATIONS

- C. M. O'Cain, B. D. Gepner, J. S. Park, R. W. Kent, J. R. Kerrigan, E. M. Spratley "Fibulotalar Cartilage Sensitivity to Syndesmotic Screw Vs. Suture Fixation," Orthopaedic Research Society, February 8-11, 2019, Phoenix, AZ, USA.
- C. M. O'Cain, B. D. Gepner, J. P. Donlon, E. M. Spratley, J. R. Kerrigan, R. W. Kent, "Implementation of Biofidelic Bone-Ligament Interaction in a Lower Extremity Finite Element Model," U.S. National Congress on Computational Mechanics, July 28 – August 1, 2019, Austin, TX, USA.
- C. M. O'Cain, B. D. Gepner, E. M. Spratley, J. R. Kerrigan, R. W. Kent, "Pipeline for Specimen Specific Bone-Ligament-Cartilage Finite Element Models," Ohio State Injury Biomechanics Symposium," May 19-21, 2019, Columbus, OH, USA.
- C. M. O'Cain, B. D. Gepner, J. R. Kerrigan, R. W. Kent, E. M. Spratley, "Effects of Syndesmotic Injury and Fixation on Tibiotalar Response," Orthopaedic Research Society, February 2-5, 2019, Austin, TX, USA.
- C. M. O'Cain, J. R. Kerrigan, E. M. Spratley, R. W. Kent, "In Situ Ligament Strain Estimation from 3D Motion Capture of Multiaxial Bony Kinematics," Orthopaedic Research Society, February 2-5, 2019, Austin, TX, USA.
- C. M. O'Cain, S. Roccabianca, R.C. Anderson, K.S. Miller, "Biomechanical Roles of Glycosaminoglycan Clusters in Tendon Homeostasis," Summer Biomechanics, Bioengineering, and Biotransport Conference, June 21-24, 2017, Tucson, AZ, USA.
- W. Spivey, C. M. O'Cain, B. D. Gepner, E. M. Spratley, J. S. Park, J. R. Kerrigan, "Effect of Total Ankle Replacement On Ankle Kinematics During Internal Rotation," Orthopaedic Research Society, February 8-11, 2019, Phoenix, AZ, USA.
- E. M. Spratley, C. M. O'Cain, J. P. Donlon, B. D. Gepner, J. L. Forman, R. W. Kent, "Ligament Wrapping in a Finite Element Model for Predicting Strain within the Midfoot and Forefoot," International Research Council of Biomechanics of Injury, September, 12-14, 2018, Athens, Greece.
- W. Spivey, C. M. O'Cain, B. D. Gepner, E. M. Spratley, J. R. Kerrigan, "Development of Dynamic Muscle Activation System for the Investigation of Lower Extremity Function," Ohio State Injury Biomechanics Symposium," May 19-21, 2019, Columbus, OH, USA.
- W. Spivey, C. M. O'Cain, B. D. Gepner, E. M. Spratley, J. R. Kerrigan, "Implementing Real-Time Extrinsic Muscle Control in a Robotic Gait Simulator for Investigating Lower Extremity Function," Summer Biomechanics, Bioengineering, and Biotransport Conference, June 25-28, 2019, Seven Springs, PA, USA.