

Christopher J. Hernandez

Contact Information

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Education

Stanford University, Stanford, CA, 1996-2001
Ph.D., Mechanical Engineering 2001, Specialization: Biomechanics, Solid Mechanics
M.S., Mechanical Engineering 1997

Harvard University, Cambridge, MA, 1992-1996
S.B., Engineering Sciences (biomedical engineering), Cum Laude

Positions

Cornell University, Ithaca, NY

Professor 2020-Present
Sibley School of Mechanical and Aerospace Engineering
Associate Director of Graduate Affairs 2017-2020
Sibley School of Mechanical and Aerospace Engineering
Associate Professor 2012-2020
Assistant Professor 2010-2012.
Sibley School of Mechanical and Aerospace Engineering
Meinig School of Biomedical Engineering

Hospital for Special Surgery, NY, NY

Adjunct Scientist 2010-Present
Biomechanics, Hospital for Special Surgery, NY, NY

Case Western Reserve University, Cleveland, OH

Assistant Professor 2005 – 2010.
Department of Mechanical and Aerospace Engineering
Secondary Appointments:
Assistant Professor 2005 – 2010. Department of Orthopaedic Surgery.
Assistant Professor 2007 – 2010. Department of Biomedical Engineering
Research Associate 2007 – 2012. Department of Physical Anthropology, Cleveland Museum of Natural History

University of California, Berkeley, CA

Visiting Post Doctoral Researcher 2002 – 2004.
Associate Specialist 2004 – 2005.
Department of Mechanical Engineering (advisor Tony Keaveny)

The Mount Sinai School of Medicine, NY, NY

Postdoctoral Fellow: 2001-2002.
Department of Orthopaedics (advisor Mitchell Schaffler)

Stanford University, Stanford, CA

Doctoral Dissertation: 1996-2001.

VA Palo Alto, Rehabilitation Research and Development Center, Palo Alto, CA and the Department of Mechanical Engineering, Stanford University, Stanford, CA. (advisor Dennis Carter)

Honors and Awards

Fellow, American Society for Bone and Mineral Research (ASBMR), 2019
 Mid-Career Travel Award, American Society for Bone and Mineral Research (ASBMR), 2019
 Fellow, American Institute for Medical and Biological Engineering (AIMBE), 2019
 Fuller Albright Award, American Society for Bone and Mineral Research, 2018
 Fellow, American Society of Mechanical Engineers (ASME), 2017
 Zellman Warhaft Faculty Commitment to Diversity Award, Cornell University, 2017
 American Society for Bone and Mineral Research Harold M. Frost Young Investigator, 2006
 Finalist, Orthopaedic Research Society New Investigator Recognition Award, 2006
 Finalist, Orthopaedic Research Society New Investigator Recognition Award, 2004
 Travel Award for Sun Valley Hard Tissue Workshop, 2001
 Best Technical Paper, National Technical Career Conference, 2001
 Society of Hispanic Professional Engineers Foundation Scholarship, 2000
 Ford Foundation Dissertation Fellowship, 2000
 Alice L. Jee Memorial Travel Award for Young Investigators, 1999
 NSF Graduate Fellowship, 1996

Publications

AUTHOR ORDER follows BIOSCIENCES CONVENTION: the first author performed the greatest direct effort and the last author is the Principal Investigator/Corresponding Author/Mentor

Underlined names are trainees mentored primarily by C.J. Hernandez

* Indicates that these authors contributed equally to the work.

+ Indicates co-corresponding authors

For h-index and other information:

ResearcherID: B-5290-2009 <http://www.researcherid.com/rid/B-5290-2009>

Google Scholar: <https://scholar.google.com/citations?user=WdJj2AwAAAAJ&hl=en>

ORCID: orcid.org/0000-0002-0712-6533

NIH NCBI Bibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/christopher.hernandez.1/bibliography/41141664/public/?sort=date&direction=ascending>

1. **Hernandez, C.J.** “Musculoskeletal Microbiology: The Utility of the Microbiome in Orthopaedics” (2020) *J Orthop Res* Submitted.
2. Ellis, J.L., Fu, X., Karl, J.P., **Hernandez, C.J.**, Mason, J. B. Booth, S.L. (2020) “Multiple forms of orally-supplemented menaquinones (vitamin K) convert to tissue menaquinone-4 in mice” Submitted.
3. Lu, Y., Birol, E.B., Johnson, C., **Hernandez, C.J.**, Sabin, J. (2020) “A Method for Load-Responsive Inhomogeneity and Anisotropy in 3D Lattice Generation Based on Ellipsoid Packing” *Computer-Aided Architectural Design Research in Asia*.
4. Castaneda, M., Strong, J.M., Alabi, D.A., **Hernandez, C.J.** (2020) “The Gut Microbiome and Bone Strength” *Curr Osteoporos Rep* doi: 10.1007/s11914-020-00627-x
5. Luna, M., Guss, J.D., Vasquez-Bolanos, L.S., Alepuz, A.J., Dornevil, S., Strong, J.M., Alabi, D.A., Shi, Q., Pannellini, T., Otero, M., Brito, I.L., van der Meulen, M.C.H., Goldring, S.R., **Hernandez, C.J.** (2020)

“Obesity and Load-induced Post-traumatic Osteoarthritis in the Absence of Fracture or Surgical Trauma” *J Orthop Res*. In Press. doi: 10.1002/jor.24799

6. Chiou, A.E., Hinckley, J.S., Khaitan, R., Varsano, N., **Hernandez, C.J.**, Estroff, L.A., Weiner, S., Addadi, L., Wiesner, U.B., Fischbach, C. (2020) “Fluorescent silica nanoparticles to label metastatic tumor cells in mineralized bone microenvironments” *Small* doi:[10.1002/smll.202001432](https://doi.org/10.1002/smll.202001432)
7. Alliston, T., Foucher, K.C., Frederick, B., **Hernandez, C.J.**, Iatridis, J.C., Kozloff, K.M., Lewis, K.J., Liu, X.S., Mercer, D.M., Ochia, R., Queen, R.M., Rimnac, C.M., van der Meulen, M.C.H., Westendorf, J. J. (2020) “The Importance of Diversity, Equity and Inclusion in Orthopaedic Research.” *J Orthop Res* doi: 10.1002/jor.24685
8. Harper, C.E., **Hernandez, C.J.** (2020) “Cell Biomechanics and Mechanobiology in Bacteria: Challenges and Opportunities” *APL Bioengineering*. 2020 Apr 1;4(2):021501. doi: 10.1063/1.5135585. Invited Submission. Featured Article.
9. **Hernandez, C.J.**, Zavattieri, P.D., Trikanad, A.A., Rimnac, C.M. (2020) “Reply to Zadpoor: Fatigue mechanisms observed in **bone** provide insight to microarchitected materials.” *Proc Natl Acad Sci U S A*. doi: 10.1073/pnas.2000331117.
10. *Genova, L.A., *Roberts, M.F., Wong, Y-C, Harper, C.E., Santiago, A.G., Fu, B., Srivastava, A., Jung, W., Kreminski, L., Mao, X., Sun, X., Yang, F., Hui, C-Y, +Chen, P, +**Hernandez, C.J.**. (2019) “Mechanical Stress Compromises Bacterial Toxin Efflux.” *Proc Natl Acad Sci U S A*. 116 (51) 25462-25467 <https://www.pnas.org/content/early/2019/11/25/1909562116>
11. Torres, A.M., Trikanad, A.A., Aubin, C.A., Lambers, F.M., Luna, M., Rimnac, C.M., Zavattieri, P., **Hernandez, C.J.** (2019) “Bone-Inspired Microarchitected Materials with Enhanced Fatigue Life” *Proc Natl Acad Sci U S A* 16 (49) 24457-24462. <https://www.pnas.org/content/116/49/24457>
12. Guss, J.D., Taylor, E., Rouse, Z., Roubert, S., Higgins, C.H., Thomas, C.J., Baker, S.P., Vashishth, D., Donnelly, E., Shea, M.K., Booth, S.L., Bicalho, R.C., **Hernandez, C.J.**. (2019) “The microbial metagenome and bone tissue composition in mice with microbiome-induced reductions in bone strength.” *Bone*. 2019. 127:146-154. doi: 10.1016/j.bone.2019.06.010.
13. **Hernandez, C.J.**, Yang, X., Ji, G., Niu, Y., Sethuraman, A.S., Koressel, J., Shirley, M., Fields, M.W., Chyou, S., Li, T.M., Luna, M., Callahan, R.L., Ross, F.P., Lu, T.T., Brito, I.L., Carli, A.V., Bostrom, M.P.G. (2019) “Disruption of the Gut Microbiome Increases Risk of Periprosthetic Joint Infection in Mice” *Clin Orthop Rel Res*. 477(11):2588-2598. doi: 10.1097/CORR.0000000000000851.
 - Highlighted in Commentary: Tan T.L. (2019) *Clin Orthop Relat Res* 477:2599-2600
14. Hunt, H.B., Torres, A.M., Palomino, P.M., Marty, E., Saiyed, R., Cohn, M., Jo, J., Warner S., Sroga, G.E., King, K.B., Lane, J.M., Vashishth, D., **Hernandez, C.J.**, Donnelly, E. (2019) “Altered tissue composition, microarchitecture, and mechanical performance in cancellous bone from men with type 2 diabetes mellitus” *J Bone Miner Res*. <https://doi.org/10.1002/jbmr.3711>.
15. Mosquera M., Kim, S., Zhou, H., Jing, T.T., Luna, M., Guss, J.D., Lai, K., Leifer, C.A., Brito, I.L., **Hernandez, C.J.**, Singh, A. (2019) “Gut microbiome and systemic metabolic syndrome modulates humoral immunity against nanovaccines.” *Science Advances*. March 27 5(3): EAAV9788. doi: 10.1126/sciadv.aav9788
16. Guss, J.D., Ziemian, S.N., Luna, M., Sandoval, T.N., Holyoak, D.T., Guisado, G.G., Roubert, S., Callahan, R.L., Brito, I.L., van der Meulen, M.C.H., Goldring, S.R., **Hernandez, C.J.** (2019) “The effects of metabolic

syndrome, obesity, and the gut microbiome on load-induced osteoarthritis” *Osteoarthritis Cartilage*. 27 (1): 129-139. <https://doi.org/10.1016/j.joca.2018.07.020>

17. Cresswell, E.N., McDonough, S.P., Palmer, S.E., **Hernandez, C.J.**, Reesink, H.L. (2019) “Can Quantitative Computed Tomography Detect Bone Morphological Changes Associated with Catastrophic Proximal Sesamoid Bone Fracture in Thoroughbred Racehorses?” *Equine Vet J*. 51 (1): 123-130. doi: 10.1111/evj.12965
18. *Levack, A.E., *Cyphert, E.L., Bostrom, M.P., **Hernandez, C.J.**, von Recum, H.A., Carli, A. (2018) “Current Options and Emerging Biomaterials for Periprosthetic Joint Infection” *Curr Rheumatol Rep*. <https://doi.org/10.1007/s11926-018-0742-4>
19. Cresswell, E.N., Nguyen, T.M., Horsfield, M.W., Alepuz, A.J., Metzger, T.A., Niebur, G.L., **Hernandez, C.J.** “Mechanically induced bone formation is not sensitive to local osteocyte density” (2018). *J Orthop Res*. 36(2): 672-81. doi: 10.1002/jor.23606.
20. Alliston, T., **Hernandez, C.J.**, Findlay, D.M., Felson, D.T., Kennedy, O.D. (2017) “Bone Marrow Lesions in Osteoarthritis: What Lies Beneath?” *J Orthop Res*. 36:1818-1825.
21. **Hernandez, C.J.** “The Microbiome and Bone and Joint Disease” (2017) *Curr Rheumatol Rep*. 19(12):77. doi.org/10.1007/s11926-017-0705-1
22. Matheny, J.B., Goff, M.G., Powder, S.L., Koff, M.F., Hayashi, K., Yang, X. Bostrom, M.P.G., van der Meulen, M.C.H., **Hernandez, C.J.** “An In Vivo Model of a Mechanically-Induced Bone Marrow Lesion” (2017) *J Biomech*. 64:258-261. doi: 10.1016/j.jbiomech.2017.09.020.
23. Guss J.D., Horsfield, M.W., Fontenele, F.F., Sandoval, T.N., Luna, M., Apoorva, F., Lima, S.F., Bicalho, R.C., Singh, A., Ley, R.E., van der Meulen, M.C.H., Goldring, S.R., **Hernandez, C.J.** (2017) “Alterations to the Gut Microbiome Impair Bone Strength and Tissue Material Properties” *J Bone Miner Res*. 32(6):1343-1353. doi: 10.1002/jbmr.3114.
24. Matheny J.B., Torres, A.M., Ominsky, M.S., **Hernandez, C.J.** (2017) “Romosozumab Treatment Converts Trabecular Rods into Trabecular Plates in Male Cynomolgus Monkeys” *Calcif Tiss Int*. 101(1):82-91. doi 10.1007/s00223-017-0258-3.
25. **Hernandez, C.J.**, van der Meulen, M.C.H. (2017) “Understanding Bone Strength Isn’t Enough” *J Bone Miner Res*. 32(6):1157-1162. doi: 10.1002/jbmr.3078.
26. **Hernandez, C.J.**, Cresswell, E.N. (2016) “Understanding Bone Strength from Finite Element Models: What Clinicians Need to Know.” *Clin Rev Bone Miner Metab*. 14 (3): 161-6. doi:10.1007/s12018-016-9218-0.
27. **Hernandez, C.J.**, Guss, J.D., Luna, M., Goldring, S.R. (2016) “Links Between the Microbiome and Bone” *J Bone Miner Res*. 31(9): 1638-46. doi: 10.1002/jbmr.2887
28. *Torres, A.M., *Matheny, J.B., Keaveny T.M., Taylor, D., Rimnac, C.M., **Hernandez, C.J.** (2016) “Material Heterogeneity in Cancellous Bone Reduces Permanent Deformations After Mechanical Failure.” *Proc Natl Acad Sci U S A*. 113(11): 2892-2897. doi: 10.1073/pnas.1520539113.
 - a. Covered by internet outlets including Futurity: <http://www.futurity.org/cancellous-bone-1113112-2/>
 - b. Covered in “Spongier Tissue, Stronger Bones” (2016) *Mechanical Engineering Magazine*. 138 (5): 22-23.
29. Cresswell, E.N., Goff, M.G., Nguyen, T.M., Lee, W.X., **Hernandez, C.J.** (2016) “Spatial Relationships between Bone Formation and Mechanical Stress within Cancellous Bone.” *J Biomech*. 49(2): 222-8.

30. Goff M.G., Lambers, F.M., Sorna R.M., Keaveny T.M., Hernandez, C.J. (2015) “Finite Element Models Predict the Location of Microdamage in Cancellous Bone Following Uniaxial Loading” *J Biomech* 48:4142-8.
31. Goff M.G., Lambers F.M., Nguyen T.M., Sung J., Rimnac C.M., Hernandez C.J. (2015) “Fatigue-induced microdamage in cancellous bone occurs distant from resorption cavities and trabecular surfaces.” *Bone* 79: 8-14.
32. Lambers, F.M., Bouman, A.R., Tkachenko, E.V., Keaveny, T.M., Hernandez, C.J. (2014) “Effects of loading mode and microstructure on the number and volume of microdamage sites in human vertebral cancellous bone.” *J Biomech* 47:3605-3612.
33. Goff, M.G., Chang, K.L., Litts, E.N., Hernandez, C.J. (2014) “The Effect of Misalignment in Orientation of Loading on the Locations of Potential Bone Formation in the Rodent Tail Loading Model.” *J Biomech.* 47:3156-61 doi: 10.1016/j.jbiomech.2014.06.016.
34. Hernandez, C.J., Lambers, F.M., Widjaja, J., Chapa, C., Rimnac, C.M. (2014) “Quantitative Relationships Between Microdamage and Cancellous Bone Strength and Stiffness” *Bone.* 66: 205-13. PMC4125443.
35. Sun, X., Weinlandt, W.H., Patel, H., Wu, M., Hernandez, C.J. (2014) “A Microfluidic Platform for Profiling Biomechanical Properties of Bacteria.” *Lab Chip.* 14 (14), 2491-2498. NIHMS600175.
36. Hernandez, C.J., Lopez, H.K., Lane, J.M. (2014) “Theoretical Consideration of the Effect of Drug Holidays on BMD and Tissue Age” *Osteoporos Int.* 25(5):1577-84. PMC4034526.
37. Lambers, F.M., Bouman, A.R., Rimnac, C.M., Hernandez, C.J. (2013) “Microdamage Caused by Fatigue Loading in Human Cancellous Bone: Relationship to Reductions in Bone Biomechanical Performance” *PlosONE.* 8(12): e83662. doi:10.1371/journal.pone.0083662. PMC3875472.
38. Matheny, J.B., Slyfield, C.R., Tkachenko, E.V., Lin, I., Ehlert, K.M., Tomlinson, R.E., Wilson, D.L., Hernandez, C.J. (2013) “Anti-resorptive agents reduce the size of resorption cavities: A three-dimensional dynamic bone histomorphometry study.” *Bone* 57(1):277-83. PMC3818704.
- **Featured on Cover.**
39. Easley, S.K., Chang, M.T., Shindich, D., Hernandez, C.J., Keaveny, T.M. (2012) “Biomechanical Effects of Simulated Resorption Cavities in Trabecular Bone Across a Wide Range of Bone Volume Fraction” *J Bone Miner Res.* 27: 1927-35. PMC3423528.
40. Goff, M., Slyfield, C.R., Kummari, S.R., Tkachenko, E.V., Fischer, S.E., Yi, I.H., Jekir, M.G., Keaveny, T.M., Hernandez, C.J. (2012) “Three-dimensional Characterization of Resorption Cavity Size and Location in Human Vertebral Trabecular Bone” *Bone.* 51: 28-37. PMC3371169.
41. Slyfield, C.R., Tkachenko, E.V., Fischer, S.E., Ehlert, K.M., Yi, I.H., Jekir, M. G., O’Brien, R.G., Keaveny, T.M., Hernandez, C.J. (2012) “Microscopic Tissue Damage Forms Preferentially Near Remodeling Cavities in Vertebral Cancellous Bone” *Bone.* 50: 1281-87. PMC3352993.
- **Featured on Cover.**
42. Liang B, Cotter M.M., Hernandez, C.J., Zhou, G. (2012) “Ectopic expression of SOX9 in osteoblasts alters bone mechanical properties”. *Calcif Tiss Int.* 90(2):76-89.

43. **Hernandez, C.J., Ramsey, D.S., Dux, S.J., Chu, E.H., Rimnac, C.M.** (2012) "Irradiation Does Not Modify Monotonic Damage Formation in Cancellous Bone." *Clin Orthop Rel Res.* 470 (9): 76-89. doi: 10.1007/s11999-011-2148-8. PMC3830084.
44. **Slyfield C.R., Tkachenko, E.V., Wilson, D.L., Hernandez, C.J.** (2012) "Three-Dimensional Dynamic Bone Histomorphometry." *J Bone Miner Res.* 27: 486-495. PMC3288521.
- **Featured on Cover.**
 - **Highlighted in: *IBMS BoneKEy*.** 2011 November;8(11):457-466 .
45. **Cotter, M.M., Loomis, D.A., Simpson, S.W., Latimer, B., Hernandez, C.J.** (2011) "Human Evolution and Osteoporosis-related Spinal Fracture." *PLoS One.* 6: e26658 doi:10.1371/journal.pone.0026658.
- **Highlighted** by over 100 internet articles For one example see: <http://www.sciencedaily.com/releases/2011/10/111019185817.htm>
 - **Highlighted** in *BoneKEy Reports* (2012) 1, Article number: 54 (2012) doi:10.1038/bonekey.2012.54
 - **Highlighted** in *Science* 25 May 2012: Vol. 336 no. 6084 p. 974, doi: 10.1126/science.336.6084.974
46. **Bonsignore, L.A., Colbrunn, R.W., Tatro, J.M., Messerschmitt, Hernandez, C.J., Goldberg, V.M., Stewart, M.C., Greenfield, E.M.** (2011) "Surface Contaminants Inhibit Osseointegration in a Novel Murine Model" *Bone* 49: 923-30.
47. **Stern, L. C., Brinkman, J.G., Furmanski, J., Rimnac, C.M., Hernandez, C.J.** (2011) "Near-Terminal Creep Damage Does Not Influence Fatigue Life Under Physiological Loading." *J Biomech.* 44:1995-8. PMC3543691.
48. **Dux, S.J., Ramsey, D., Chu, E.H., Rimnac, C.M., Hernandez, C.J.** (2010) "Alterations in Damage Processes in Dense Cancellous Bone Following Gamma-Radiation Sterilization" *J Biomech.* 43:1509-13.
49. **Emerton, K.B., Hu, B., Woo, A.A., Sinofsky, A., Hernandez, C., Majeska, R.J., Jepsen, K.J., Schaffler, M.B.** (2010) "Osteocyte apoptosis and control of bone resorption following estrogen withdrawal in mice." *Bone.* 46: 577-583. PMC2824001.
50. **Slyfield, C. R., Niemeyer, K. E., Tkachenko, E. V., Tomlinson, R. E., Steyer, G., Pattanacharoenphon, C. G., Kazakia, G. J., Wilson, D. L., Hernandez, C. J.** (2009). "3D surface texture visualization of bone tissue through epi-fluorescence-based serial block face imaging." *J Microsc* 236: 52-59. PMC2978811
51. **Kummari, S. R., Davis, A. J., Vega, L. A., Ahn, N., Cassinelli, E. H., Hernandez, C. J.** (2009). "Trabecular microfracture precedes cortical shell failure in rat caudal vertebrae under cyclic loading." *Calcif Tiss Int* 85: 127-33.
52. **Cotter, M. M., Simpson, S. W., Latimer, B. M., Hernandez, C. J.** (2009). "Trabecular microarchitecture of hominoid thoracic vertebrae." *Anat Rec.* 292:1098-106.
53. **Tkachenko E.V., Slyfield C.R., Tomlinson R.E., Wilson D.L., Hernandez C.J.** (2009) "Voxel Size and Measures of Individual Resorption Cavities in Three-Dimensional Images of Cancellous Bone." *Bone* 45: 487-492. PMC2728288
54. **Hernandez C.J., Loomis D.A., Cotter M.M., Schifle A.L., Anderson L.C., Elsmore L., Kunos C., Latimer B.** (2009) "Biomechanical Allometry in Hominoid Thoracic Vertebrae." *J Hum Evol* 56: 462-470.
55. **Hernandez, C.J.** (2008) "How can bone turnover change bone strength independent of bone mass?" *Bone.* 42: 1014-1020. PMC2442404

56. Bigley, R.F., Singh, M., **Hernandez, C. J.**, Kazakia, G. J., Martin, R. B., Keaveny, T.M. (2008) “Validity of serial milling-based imaging system for microdamage quantification.” *Bone*. 42: 212-215.
57. **Hernandez, C. J.**, Keaveny T.M. (2006) “A biomechanical perspective on bone quality.” *Bone*. 39:1173-1181. PMC1876764
58. **Hernandez, C.J.**, Gupta, A., Keaveny, T.M. (2006) “A biomechanical analysis of the effects of resorption cavities on cancellous bone strength.” *J Bone Min Res*. 21:1248-55. PMC1876766
59. Li, C.Y., Schaffler, M.B., Wolde-Semait, H. T., **Hernandez, C. J.**, Jepsen, K.J. (2005) “Genetic background influences cortical bone response to ovariectomy.” *J Bone Min Res*. 20:2150-8.
60. **Hernandez, C.J.**, Tang, S.Y., Baumbach, B.M., Hwu, P.B., Sakkee A. N., van der Ham F., Bank, R.A., DeGroot J., , Keaveny, T.M. (2005). “Trabecular microfracture and the influence of pyridinium and non-enzymatic glycation mediated collagen cross-links.” *Bone*. 37: 825-832.
61. **Hernandez, C.J.**, Majeska, R.J., Schaffler, M.B. (2004). “Osteocyte density in woven bone.” *Bone*. 35:1095-9.
62. **Hernandez, C.J.**, Beaupré, G.S. and Carter, D.R. (2003). “A theoretical analysis of the relative influences of peak BMD, age-related bone loss and menopause on the development of osteoporosis.” *Osteoporos Int*. 14: 843-7.
63. **Hernandez, C. J.**, Beaupré, G. S., and Carter, D. R. (2003). “A theoretical analysis of the changes in basic multicellular unit activity at menopause.” *Bone*. 32:357-363.
64. **Hernandez, C.J.**, Beaupré, G.S., Marcus, R., and Carter, D.R. (2002) “Long term predictions of the equivalence of daily and less than daily alendronate dosing.” *J Bone Min Res*. 17:1662-6.
65. **Hernandez, C.J.**, Beaupré, G.S., Marcus, R. and Carter, D.R. (2001). “A theoretical analysis of the contributions of remodeling space, mineralization and bone balance to changes in bone mineral density during alendronate treatment.” *Bone*. 29: 511-516.
66. **Hernandez, C.J.**, Beaupré, G.S., Keller, T.S. and Carter, D.R. (2001). “The influence of bone volume fraction and ash fraction on bone strength and modulus.” *Bone*. 29: 74-78.
67. **Hernandez, C. J.**, Beaupré, G. S. and Carter, D. R. (2000). “A model of mechanobiologic and metabolic influences on bone adaptation.” *J Rehab Res Develop*. 37: 235-44.
68. **Hernandez, C. J.**, Hazelwood, S. J. and Martin, R. B. (1999). “The relationship between BMU activation and origination in cancellous bone.” *Bone*. 25: 585-587.

Book Chapters

van der Meulen M.C.H., **Hernandez C.J.**. Adaptation of Skeletal Structure to Mechanical Loading. In: Marcus R, Feldman D, Dempster D, Cauley J, Luckey M, editors. Osteoporosis. 4th Edition ed. San Diego, CA, USA: Elsevier; 2020.

Hernandez, C.J. “Bone Mechanical Function and the Microbiota” Understanding the Gut-Bone Signaling Axis: Mechanisms and Therapeutic Implications. Springer. 2018 [10.1007/978-3-319-66653-2_12](https://doi.org/10.1007/978-3-319-66653-2_12)

Hernandez, C.J. “Cancellous Bone.” In: Murphy, W. L. editor. Handbook of Biomaterial Properties, 2nd ed. Springer. 2016.

van der Meulen M.C.H., **Hernandez C.J.**. Adaptation of Skeletal Structure to Mechanical Loading. In: Marcus R, Feldman D, Dempster D, Cauley J, Luckey M, editors. Osteoporosis. 4th Edition ed. San Diego, CA, USA: Elsevier; 2013.

Media Presence

2019

“Bone inspired microarchitectures with enhanced fatigue life” Physics World

<https://physicsworld.com/a/breaking-the-mystery-of-bone-micro-architecture/>.

“‘Buildings’ in human bone may hold key to stronger 3D-printed lightweight structures”

<https://www.purdue.edu/newsroom/releases/2019/Q4/buildings-in-human-bone-may-hold-key-to-stronger-3d-printed-lightweight-structures.html>

“Physical forces affect bacteria’s toxin resistance, study finds” Cornell Chronicle Dec 5, 2019.

<https://news.cornell.edu/stories/2019/12/physical-forces-affect-bacterias-toxin-resistance-study-finds>

“Bone breakthrough may lead to more durable airplane wings” Cornell Chronicle, Nov. 21, 2019.

<https://news.cornell.edu/stories/2019/11/bone-breakthrough-may-lead-more-durable-airplane-wings#>

“Link Found between gut bacteria and successful joint replacement” Cornell Chronicle, July 17, 2019

<https://news.cornell.edu/stories/2019/07/link-found-between-gut-bacteria-successful-joint-replacement#>

“Bone and the Microbiome have a Brittle Relationship” The Scientist, July 11, 2019

<https://www.the-scientist.com/news-opinion/bone-and-the-microbiome-have-a-brittle-relationship-66116>

2017

Accepting Inconvenient Facts (Ithaca March for Science, April 22, 2017):

https://youtu.be/PM_kZvtbWAg

Orthopaedic Research Society Video Outreach Competition, Third Place

<https://youtu.be/o4dggJ9YcmE>

2016

“Spongier Tissue, Stronger Bones” (2016) Mechanical Engineering Magazine. 138 (5): 22-23.

Featured on Academic Minute

<http://academicminute.org/2016/05/chris-hernandez-cornell-university-bones-reveal-new-engineering-secret/>

Featured on Cornell Chronicle

<http://www.news.cornell.edu/stories/2016/02/function-after-failure-bone-translates-engineering-strategy>

2015

Faculty help diversity the op-ed landscape through Public Voices program. Cornell Chronicle.

<http://www.cornell.edu/video/public-voices-faculty-diversify-op-ed-landscape>

“Use NIH to Stop the Job Killers” **Hernandez, C.J.** The Hill.

<http://thehill.com/blogs/congress-blog/246971-use-the-nih-to-stop-job-killers>

“My Own McFarland Story” **Hernandez, C.J.** Fox News Latino.

<http://latino.foxnews.com/latino/opinion/2015/02/19/opinion-my-own-mcfarland-story-with-happy-ending/>

2013

Hernandez, C.J. (2013) “Bone fatigue, stress fractures and bone repair (Sun Valley 2013)”. Bonekey 10:448.

doi:10.1038/bonekey.2013.182

2012

Highlighted in *BoneKEy Reports* (2012) 1, Article number: 54 (2012) doi:10.1038/bonekey.2012.54

Highlighted in *Science* 25 May 2012: Vol. 336 no. 6084 p. 974, doi: 10.1126/science.336.6084.974

2011

Over 100 internet news sites reported on “Human Evolution and Osteoporosis-related Spinal Fracture.”

For one example see: <http://www.sciencedaily.com/releases/2011/10/111019185817.htm>

Invited Conference Presentations

“Mechanobiology of Microbes in Musculoskeletal Tissues” ORS Musculoskeletal Biology Workshop. Snowbird, UT, USA. 2021

“The Microbiome and Bone and Joint Disease” Tissue Repair and Regeneration Gordon Research Conference. Colby College, NH, USA. 2021

“The Microbiome and Orthopaedic Disorders” Emory University School of Medicine, Musculoskeletal Research Symposium, April 2020 CANCELLED FOR PANDEMIC

“The Microbiome and Implant Infection” Clare Valley Bone Meeting, Clare, South Australia Feb 2020

“Biological regulation of bone quality” Clare Valley Bone Meeting, Clare, South Australia Feb 2020

“The Microbiome and Bone” Bone and Teeth Gordon Research Conference. Galveston, TX, USA, Feb 2020.

“The Microbiome and Periprosthetic Joint Infection” eCM Orthopaedic Infection. Davos, Switzerland, June 2019.

“The Microbiome and Bone Strength” NYU/Orthopaedic Research Society Northeast Symposia, June 2019

“What is the Microbiome and How is it Relevant to Musculoskeletal Disease?” Orthopaedic Research Society. Austin, TX, USA. February 2019.

“Bone Strength and the Microbiome” American Society for Bone and Mineral Research. “Gut Microbiome” session. Montréal, Québec, Canada. September 2018.

“Effects of the Microbiome on Bone Strength and Tissue Material Properties” 7th International Conference on Osteoimmunology: Interactions of the Immune and Skeletal Systems. Chania, Crete, Greece. June 2018.

“Beyond Whole Bone Strength” American Society for Bone and Mineral Research Pre-Meeting Symposium: Current Concepts in Bone Fragility: From Cells to Surrogates*. Denver, CO, USA. September 2017.

“Musculoskeletal Microbiology: The Microbiome and Bone and Joint Disease” Trinity College Dublin, Dublin, Ireland, July 2017.

“Three Dimensional Imaging of Bone, Microdamage and Remodeling” Summer Symposium Royal College of Surgeons of Ireland, Dublin, Ireland, July 2017.

“The Microbiome and Bone” 12th Annual Meeting Update on Osteoporosis and Skeletal Health. Northern California Institute for Bone Health, Oakland, CA, 2017.

- “Microdamage and Bone Remodeling in Bone Marrow Lesions” in the workshop “Bone Marrow Lesions: What Lies Beneath” organized by O. Kennedy and T. Alliston. Orthopaedic Research Society National Meeting 2017.
- “Disruption of the Gut Microbiome Impairs Bone Strength and Tissue Mechanical Properties.” Gordon Research Conference on Musculoskeletal Bioengineering. Andover, NH, USA, 2016.
- “Microbiome and Joint Disease” AAOS/ORS Workshop Tackling Joint Disease by Understanding Crosstalk between Cartilage and Bone. Rosemont, IL, USA, 2016.
- “Techniques for Probing Tissue-Level Mechanical Properties” Contribution to “Tissue Level Composition and Mechanical Measurements. What Could Possibly go Wrong?” Orthopaedic Research Society National Meeting. New Orleans, LA, USA, 2014.
- “Bone Fatigue, Bone Repair: How does it relate to Stress Fractures” Workshop on Musculoskeletal Biology, Sun Valley, ID, USA, 2013
- “Remodeling and Bone Quality” AAOS/ORS Bone Quality and Fracture Prevention Research Symposium. Rosemont IL, USA. 2013
- “The Mechanical Impact of Bone Turnover: A Structural Analysis of the Effects of Remodeling Cavities on Cancellous Bone Strength” Workshop on Skeletal Tissue Biology, Sun Valley, ID, USA, 2006.
- “Mechanobiologic and Metabolic Factors in Bone Remodeling.” Hard Tissue Workshop, Sun Valley ID, USA. 1999.

Invited Institutional Seminars/Lectures

- Worcester Polytechnic Institute, Department of Biomedical Engineering, Spring 2020 VIRTUAL
- Washington University in St. Louis, Musculoskeletal Research Center, Fall 2020 VIRTUAL
- Mayo Clinic, Department of Orthopaedics, Summer 2020 VIRTUAL
- Columbia University, Department of Biomedical Engineering, Summer 2020 VIRTUAL
- UC Davis, Department of Orthopaedics, Spring 2020 VIRTUAL
- Georgia Institute of Technology, Petit Institute for Bioengineering and Bioscience, Spring 2020 CANCELLED
- University of Adelaide, Centre for Orthopaedic Trauma and Research, Adelaide, Australia, Spring 2020
- St. Vincent’s Institute for Medical Research, Melbourne, Australia, Spring 2020
- University of Arizona, Arthritis Center, Spring 2020
- Brigham and Women’s Hospital, Harvard Medical School, Department of Orthopaedics, Fall 2019
- Iowa State University, Department of Mechanical Engineering, Fall 2019
- ETHZurich, Institute of Biomechanics, Zurich, Switzerland, Summer 2019
- Rush University Medical Center, Medicine, Spring 2019
- Columbia University, Department of Orthopaedics, Fall 2018
- University of Illinois, Urbana-Champaign, Mechanical Science and Engineering, Fall 2018
- University of Pennsylvania, Musculoskeletal Research Center, Fall, 2018
- Purdue University, Department of Civil Engineering, Spring 2018
- Indiana University Purdue University Indianapolis, Anatomy and Cell Biology, Spring 2018
- Hospital for Special Surgery, Metabolic Bone Disease Grand Rounds, Spring 2018
- Tufts University, Jean Mayer USDA Human Nutrition Research Center on Aging, Fall 2017
- Boston University, Department of Mechanical Engineering, Fall 2017
- Lawrence Livermore National Labs, Bioscience and Biotechnology Division, Spring 2017
- University of Toronto, Biomedical Engineering, Spring 2016
- UC Riverside, Department of Mechanical Engineering, Spring 2015
- Cornell University, Sibley School of Mechanical and Aerospace Engineering, Fall 2014

UC San Diego, Department of Mechanical Engineering, Spring 2014
 Indiana University Purdue University Indianapolis, Fall 2013
 Stanford University, Department of Mechanical Engineering, Fall 2013
 University of Rochester, Department of Biomedical Engineering, Spring 2013
 Rensselaer Polytechnic Institute, Department of Biomedical Engineering, Spring 2012
 UC Davis, Department of Orthopaedics, Fall 2011
 UC Berkeley, Department of Mechanical Engineering, Fall 2011
 Stanford University, Department of Mechanical Engineering, Fall 2011
 VA Palo Alto, Bone and Joint Center, Fall 2011
 Hospital for Special Surgery, Metabolic Bone Disease Grand Rounds, Fall 2011
 Hospital for Special Surgery, Biomechanics Division, Summer 2011
 New York City Bone Club, City University of New York, Fall 2010
 City College of New York, Department of Biomedical Engineering, Fall 2010
 Alfred University, Inamori School of Engineering, Fall 2010
 Ohio State University, Department of Biomedical Engineering, Spring 2010
 Cornell University, Department of Mechanical and Aerospace Engineering, Spring 2009
 University of Michigan, Department of Biomedical Engineering, Fall 2008
 Indiana University Purdue University Indianapolis, Department of Anatomy and Cell Biology, Spring 2008
 Case Western Reserve University, Department of Biomedical Engineering, Spring 2008
 Columbia University, Department of Biomedical Engineering, Summer 2007
 University of Toledo, Department of Mechanical Engineering, Fall 2007
 Case Western Reserve University, Department of Orthopaedics, Fall 2006
 Boston University, Department of Mechanical Engineering, Fall 2005

Abstract Presentations (national and international meetings, out of 102 total)

1. Castaneda, M., Smith, K., Nixon, J.C., Rowan, S., **Hernandez, C.J.** (2020) “Alterations to the Gut Microbiome Impair Bone Tissue Strength in Aged Mice” American Society for Bone and Mineral Research. Seattle, WA, USA.
2. Luna, M., Guss, J.D., Vasquez-Bolanos, L.S., Castaneda, M., Vargas Rojas, M., Strong, J.M., Alabi, D.A., Dorenevil, S., Taylor, E.A., Bicalho, R., Donnelly, E.L., **Hernandez, C.J.** (2020) “Identifying Components of the Gut Microbiome that Regulate Bone Tissue Mechanical Properties” American Society for Bone and Mineral Research. Seattle, WA, USA.
3. Ji, G., Yang, X., Bostrom, M.P.G., Carli, A.V., **Hernandez, C.J.** (2020) “The Microbial Metabolite Butyrate Improves Response to Periprosthetic Joint Infection in Mice with Compromised Gut Microbiota” Musculoskeletal Infection Society. Fort Lauderdale, FL, USA.
4. **Hernandez, C.J.**, Luna, M., Vasquez-Bolanos, L.S., Castaneda, M. (2019) “Identifying the Components of the Gut Microbiota that Influence Bone Strength” Biomedical Engineering Society, Philadelphia, PA, USA.
5. **Hernandez, C.J.**, Torres, A.M., Trikanad, A.A., Aubin, C., Lambers, F.M., Luna, M., Rimnac, C.M., Zavattieri, P. (2019) “Fatigue failure of cancellous bone is sensitive to an unexpected aspect of microarchitecture: A study with bone biomechanics and 3D printing.” American Society for Bone and Mineral Research, Orlando, FL, USA. **Mid-Career Investigator Travel Award.**
6. Ellis, J.L., Fu, X., Karl, J.P., **Hernandez, C.J.**, Mason, J.B., Booth, S.L. (2019) “Purified and Food-based Menaquinones Accumulate in Liver and Feces of C57BL6 Mice” ASN Nutrition. Baltimore, MD, USA.
7. Luna, M., Guss, J.D., Vasquez-Bolanos, L.S., Alepuz, A., Strong, J., Callahan, R., Brito, I.L., van der

Meulen, M.C.H., Goldring, S.R., **Hernandez, C.J.** (2019) “Early Joint Degeneration After Mechanical Overload is Not Sensitive to Obesity”. Trans. Orthopaedic Research Society, Austin, TX, USA.

8. Vasquez-Bolanos, L.S., Luna, M., Hernandez, C.J. (2019) “Selective removal of components of the gut microbiome has differential effects on bone strength.” Trans. Orthopaedic Research Society, Austin, TX, USA.

Ongoing Research Support

R56 AG067997-01 Hernandez (PI) 09/30/20-08/31/21
NIH/NIA \$597,237 Total Costs
“The Microbiome and Bone Strength”
This the first year of support for R01 AG067997 awarded by the institute before awarding the R01 project.
Role: PI

R01 AG067997-01 Hernandez (PI) 04/01/21-03/31/26
NIH/NIA (Scored at 1% in Fall 2020) \$3,761,923 Total Costs
“The Microbiome and Bone Strength”
In this project we determine how changes in the gut microbiome regulate bone tissue material properties.
Role: PI

W911NF1910121 Chen, Hernandez co-PI 02/16/19-02/15/22
Army Research Office \$180,000 Hernandez
“Single-cell Super-resolution Imaging of Bacterial Metal Efflux Mechanobiology”
In this project we examine the effects of mechanical forces on bacterial proteins involved in toxin resistance/efflux.
Role: Co-PI

McManus Award Hernandez (PI) 12/15/18-12/14/20
Cornell Sibley School of Mechanical Engineering
“Funds to Support a Change in Research Direction”
These funds are an internal award to allow faculty to transition their research goals. I am using these funds to transition to microbiome-orthopaedics related research.
Role: PI

R21 AR073454 Hernandez (PI) 05/01/2018-02/28/2020
NIH/NIAMS \$407,061 Total Costs
“The Role of Bone Resorption in Bone Marrow Lesions”
In this project we use a novel animal model to study the underlying mechanisms within bone marrow lesions
Role: PI

Pending Research Support

2055214 Hernandez (PI) 04/01/21-03/31/24
“Mechanoregulation in the Maintenance of the Bacterial Cell Wall”
In this project we explore the two-component response regulator VxrAB as a mechanosensitive system in *V. Cholerae*.
Role: PI

R01AR078886 Hernandez (PI) 04/01/21-3/31/25
NIH/NIAMS
“The Microbiome and Periprosthetic Joint Infection”
In this project we examine the effects of the gut microbiome on susceptibility to periprosthetic joint infection.

11/05/20

Role: PI

R01 AR075122 Donnelly (PI) 04/01/20-03/31/25
NIH

“Identifying the Critical Multiscale Determinants of Bone Fracture Resistance”

In this project we examine the effects of bone tissue material properties on brittleness using clinical specimens.

Role: Co-I

Completed Research Support

R21AR071534-01 Hernandez, Bostrom (multiple PI) 02/01/2017-01/31/2020
NIH/NIAMS \$430,855 Total Costs

“The Microbiome as a Risk Factor for Periprosthetic Joint Infection”

In this project we test the idea that an impaired gut flora can influence rates of infection during joint replacement.

Role: PI (multiple-PI)

1362934 Hernandez (PI) 03/15/15–03/14/18
NSF/CMMI \$400,000 Total Costs

“Biomechanics and Mechanobiology of Live Bacteria”

In this project we use microfluidic devices to mechanically stimulate live bacteria.

Role: PI

R21 AR068061 Hernandez (PI) 03/01/15-02/28/17
NIH/NIAMS \$370,946 Total Costs

“Separating Systemic Inflammation From Obesity in Load-Induced Osteoarthritis”

In this project we explore the effects of systemic inflammation on susceptibility to osteoarthritis following mechanical loading.

Role: PI

PR141864 Hernandez (PI) 08/24/2015-02/23/17
CDMRP/DoD \$311,389 Total Costs

“Alterations in Gut Microbiota and Post-Traumatic Osteoarthritis”

In this project we determine how alterations in the microbiome influence the development of post-traumatic OA.

Role: PI

R01 AR057362-01 Hernandez (PI) 03/01/10-02/28/14
NIH/NIAMS \$1,231,165 Total Costs

“Biomechanical Effects of Microstructural Flaws in Cancellous Bone”

In this project we seek to understand the influence of resorption cavities on the formation of microscopic tissue damage and the corresponding changes in cancellous bone strength and resistance to cyclic loading.

Role: PI

1068260 Hernandez (PI) 07/01/11-06/30/14
NSF \$300,000 Total Costs

“Spatial Relationships Between Trabecular Bone Tissue Strain and Bone Formation”

In this project we use an in vivo animal model, finite element modeling and high resolution 3D fluorescent imaging to determine if local tissue strains are spatially related to regions of new bone formation.

Role: PI

No Number Hernandez (PI) 07/01/13 – 06/30/15
AMGEN \$50,000 Total Costs

Formation of New Trabeculae with Sclerostin Antibody Treatment

This project involves applying three dimensional dynamic bone histomorphometry to specimens of monkey vertebral bone from animals treated with sclerostin antibody

Role: PI

S10 RR033461 Hernandez (PI) 04/20/13 – 04/19/14
NIH \$754,684 Total Costs
“Acquisition of a Nano Computed Tomography Instrument for shared Cornell Imaging”

Number: F33AR065348Hernandez (PI) 09/01/13 – 05/01/14
NIH \$51,022 Total Costs
“Associations between gut microbiota, flagellin production and bone microstructure”
Role: PI

R21 AR 054448-01 Hernandez (PI) 09/01/07-08/31/09
NIH/NIAMS \$337,514 Total Costs
“Three-Dimensional Dynamic Bone Histomorphometry”
Role: PI

RES 106726 Hernandez (PI) 01/01/08-06/30/09
Musculoskeletal Transplant Foundation \$100,000 Total Costs
“Biomechanical Consequences of Gamma Radiation Sterilization on Cancellous Bone Allograft”
Role: PI

No Number Hernandez (PI) 04/05/11-07/01/13
Musculoskeletal Transplant Foundation \$50,000 Unrestricted Gift
“Distribution of Bacteria in Allograft”
Role: PI

No Number Rimnac (PI) 01/01/09-12/31/09
“Effect of microscopic tissue damage on the long-term viability of cortical bone allografts”
Role: Co-Investigator

RES 502548 Hernandez (PI) 07/01/07-06/30/09
Case Western Reserve University
Presidential Research Initiative
“An In Vivo Model of Damage and Repair of Cancellous Bone”
Role: PI

Mentoring

Post-doctoral Fellows

Name	University	Year
Xuanhao Sun	Cornell University	2012-2013
Floor M. Lambers	Cornell University	2011-2013

Doctoral Students (Primary Advisor)

Name	Title - Year	Degree Field
Junsung Lee	Current	Mechanical Engineering
Christine E. Harper	Current	Biomedical Engineering
Melanie Roberts	Current	Mechanical Engineering

Marysol Luna	“The influence of the Gut Microbiome on Bone and Joint Disease”	Mechanical Engineering
Jason D. Guss	“The Role of the Gut Microbiome in Bone and Joint Disease” 2018	Biomedical Engineering
Ashley Torres	“Fatigue Behavior of Cancellous Bone, Microdamage Accumulation and Biologically Inspired Cellular Solids” 2018	Biomedical Engineering
Jonathan Matheny	“Interactions Between Bone Remodeling and Microdamage in Cancellous Bone” 2017	Biomedical Engineering
Erin Cresswell (Litts)	“Spatial Regulation of Bone Formation in Functional Adaptation of Cancellous Bone” 2017	Mechanical Engineering
Matthew Goff	“The Role of Micro and Ultra-Structure in Accumulation in Cancellous Bone” 2015	Biomedical Engineering
Craig R. Slyfield	“The Biomechanics of Cancellous Bone Remodeling” 2012	Mechanical Engineering
Meghan Cotter	“Gross Morphology, Microarchitecture, Strength and Evolution of the Hominoid Vertebral Body” 2011 Case Western Reserve University	Evolutionary Biology
Seetha Ramudu Kummari	“Experimental and Computational Evaluation of Microscopic Tissue Damage and Remodeling Cavities in Trabecular Bone” 2011 Case Western Reserve University	Mechanical Engineering

Masters of Science Students (with Thesis, Primary Advisor)

Name	Title	Degree Field	Year of Completion
Yu-Chern “Chad” Wong	“Stress Analysis of Bacteria Submitted to Extrusion Loading”	Mechanical Engineering	2018
Remy Walk	“Bone phenotype of Toll-like Receptor 5 Deficient (TLR5KO) Mice and PTH Treated Osteopenic Sheep”	Mechanical Engineering	2017
Katherine Ehlert	“Methods of Measuring Microscopic Tissue Damage in Cancellous Bone: Sampling and Statistical Power”	Mechanical Engineering	2013
Evgeniy Tkachenko	“Measures of Resorption Cavities in Three-dimensional Images of Cancellous Bone”	Mechanical Engineering	2011
Daniel Ramsey	“Effects of Irradiation on the Damage Processes in Human Trabecular Bone” Case Western Reserve University	Mechanical Engineering	2010
Justin Daggett	“Measures of Remodeling Cavity Size and Number in Cancellous Bone Following Estrogen Depletion” Case Western Reserve University	Biomedical Engineering	2009
David A. Loomis	“A Biomechanical Analysis of Ape and Human Thoracic Vertebrae Using Quantitative Computed Tomography Based Finite Element Models” Case Western Reserve University	Mechanical Engineering	2009
Stephanie Dux	“The Effect of Gamma Radiation Sterilization on Yield Properties and Microscopic Tissue Damage in Dense Cancellous Bone” Case Western Reserve University	Mechanical Engineering	2009
Craig R. Slyfield	“Automated Sub-Micron Resolution Serial Block Face Imaging of Cancellous Bone using Epifluorescence Microscopy”	Mechanical Engineering	2008

	Case Western Reserve University		
Andrew Schifle	“A Biomechanical Study of Vertebral Allometry in Primates” Case Western Reserve University	Mechanical Engineering	2007

Masters of Engineering Students and Non-Thesis Master’s Degree (Primary Advisor)

Name	University	Degree Field	Year of Completion
Bowen Luo	Cornell University	Biomedical Engineering	Current
James Abert	Cornell University	Mechanical Engineering	Current
Colby Johnson	Cornell University	Mechanical Engineering	2020
Josue Santana	Cornell University	Biomedical Engineering	2019
Taylor Sandoval	Cornell University	Mechanical Engineering	Current
Ritvik Sarkar	Cornell University	Mechanical Engineering	2016
Kristin Lee	Cornell University	Mechanical Engineering	2016
Liza Man	Cornell University	Mechanical Engineering	2015
Rachel Sorna	Cornell University	Mechanical Engineering	2014
Will Weinlandt	Cornell University	Mechanical Engineering	2014
Yejin Kim	Cornell University	Biomedical Engineering	2013-2014
Melissa Xu	Cornell University	Biomedical Engineering	2013-2014
Daniel Blackman	Cornell University	Biomedical Engineering	2013-2014
Christopher Chapa	Cornell University	Mechanical Engineering	2013
Jin Yan	Cornell University	Mechanical Engineering	2013
Katarina Chang	Cornell University	Mechanical Engineering	2012
Kevin Yam	Cornell University	Mechanical Engineering	2012
Ting Li	Cornell University	Biomedical Engineering	2012
Abby George	Cornell University	Biomedical Engineering	2012
Bo Li	Cornell University	Mechanical Engineering	2012
Jung Kim	Cornell University	Biomedical Engineering	2012

Ph.D. Student Committee Member

Name	Advisor (University)	Degree Field	Year
Xieyue “Sharon” Xiao	Brito (Cornell University)	Biomedical Engineering	Current
Rachel Miller	Shepherd (Cornell University)	Materials Science Engineering	Current
Amanda Rooney	van der Meulen (Cornell University)	Biomedical Engineering	2020
Jessie Ellis	Booth (Tufts University)	Nutrition	2020
Lauren Genova	Chen (Cornell University)	Chemistry	2020
Sophia Ziemian	van der Meulen (Cornell University)	Biomedical Engineering	2020
Pablo Palomino	Donnelly (Cornell University)	Biomedical Engineering	2019
Ashley Lloyd	Donnelly (Cornell University)	Materials Science Engineering	Current
Derek Holyoak	van der Meulen (Cornell University)	Biomedical Engineering	2018
T. Julia Chen	van der Meulen (Cornell University)	Mechanical Engineering	2017
Garry Brock	van der Meulen (Cornell University)	Mechanical Engineering	2014
Chi Zhang	Gao (Cornell University)	Mechanical Engineering	2013

Frank Ko	van der Meulen (Cornell University)	Mechanical Engineering	2013
Matthew Leinebeweber	Gao (Cornell University)	Mechanical Engineering	2014
Radhika Patel	Gao (Cornell University)	Mechanical Engineering	2014
Lindsay Bonsignore	Greenfield (Case Western Reserve University)	Biomedical Science	2011
Elaine Lee	von Recum (Case Western Reserve University)	Biomedical Engineering	2011
Kerim Genc	Cavanaugh (Case Western Reserve University)	Biomedical Engineering	2011
Fuping Yuan	Prakash (Case Western Reserve University)	Mechanical Engineering	2007
Michael Sobieraj	Rimnac (Case Western Reserve University)	Mechanical Engineering	2007
Liren Tsai	Prakash (Case Western Reserve University)	Mechanical Engineering	2006
Karen Warden	Davy (Case Western Reserve University)	Mechanical Engineering	2006

Undergraduate Student Mentoring (not including senior projects)

Name	University	Degree Field	Years
Jacob Nixon	Cornell University	Mechanical Engineering	2020-Present
Meredith Dobrzynski	Cornell University	Computer Science	2019-2020
Malissa Ramsukh	Cornell University	Biology	2019-Present
Brian Arenas	Cornell University	Mechanical Engineering	2019
Sophie Dornevil	Cornell University	Biology	2018-Present
David Shamritsky	Cornell University	Biomedical Engineering	2019-Present
Denise Alabi	Cornell University	Biology	2017-2020
Jasmin Strong	Cornell University	Biology	2018-2020
Natalie Kalos	Cornell University	Biomedical Engineering	2018
Kimberly Hemmerling	Cornell University	Biological Engineering	2017-2017
Meghana Machireddy	Cornell University	Mechanical Engineering	2017-2019
Sebastian Roubert	Cornell University	Mechanical Engineering	2016-2018
Adrian Alepuz	Cornell University	Mechanical Engineering	2016-2018
Laura Vasquez-Bolanos	Cornell University	Mechanical Engineering	2016-2019
Kyle Cripps	UC Berkeley	Computer Science	REU 2016
Gabriel Guisado	University of Rochester	Biomedical Engineering	REU 2016, 2017
Taylor Sandoval	Cornell University	Mechanical Engineering	2015-2018
Jonlin Chen	Cornell University	Biological Engineering	2015-2016
Lucy Wang	Cornell University	Mechanical Engineering	2015-2017
Fernanda Fontenele	University Federal de Sergipe	Mechanical Engineering	Brazil Scientific Mobility Sum 2015
Nisha Gupta	Case Western Reserve University	Biomedical Engineering	REU 2015
Saie Ganoo	Cornell University	Mechanical Engineering	2015
Ritvik Sarkar	Cornell University	Mechanical Engineering	2015
Lauren Henderson	Cornell University	Biology	2014-2015

Michael Horsfield	Cornell University	Biological Engineering	2014-2016
Aaron Chen	Cornell University	Unaffiliated	2014
Seth Kline	Cornell University	Physics	2013
Wei “Kristin” Lee	Cornell University	Mechanical Engineering	2013-2014
William Weinlandt	Cornell University	Biological Engineering	2012-2013
Harsh Patel	Cornell University	Physics	2012-2013
Irene Lin	Cornell University	Civil Engineering	2012-2014
John Widjaja	Cornell University	Biological Engineering	2012-2013
Thu Nguyen	Cornell University	Mechanical Engineering	2012-2015
Hellen Lopez	Cornell University	Mechanical Engineering	2012
Amanda Bouman	Cornell University	Mechanical Engineering	2011-2015
Robert Zhang	Cornell University	Mechanical Engineering	2011-2013
Sam Fischer	Cornell University	Mechanical Engineering	2011-2012
Christopher Chapa	Cornell University	Mechanical Engineering	2011-2013
Ingrid (Tse-Yin) Tu	Cornell University	Mechanical Engineering	2011-2012
Kristin Regan	Cornell University	Mechanical Engineering	2011-2013
Katarina Chang	Cornell University	Mechanical Engineering	2011
Paul Scilingo	Cornell University	Mechanical Engineering	2011-2012
Pritika Dasgupta	Cornell University	Biological Engineering	2010-2011
Abhinav Rao	Cornell University	Mechanical Engineering	2010-2011
J.P. Siemon	Case Western Reserve University	Biomedical Engineering	2009-2010
Brendan Goodwine	Case Western Reserve University	Biomedical Engineering	2009-2010
Katherine Ehler	Case Western Reserve University	Mechanical Engineering	2007-2010
Shangjin Li	Case Western Reserve University	Biomedical Engineering	2009
Anthony Turner	Case Western Reserve University	Mechanical Engineering	2008
Ryan Tomlinson	Case Western Reserve University	Biomedical Engineering	2006-2008
Nathan Johnson	Case Western Reserve University	Mechanical Engineering	2006-2008
Stephanie Dux	Case Western Reserve University	Mechanical Engineering	2007-2008
Karina Hendarto	Case Western Reserve University	Biomedical Engineering	2007-2008
Matthew Aehle	Case Western Reserve University	Biomedical Engineering	2007-2008
Kyle Niemeyer	Case Western Reserve University	Mechanical Engineering	2007
Bojian Popove	Case Western Reserve University	Mechanical Engineering	2006-2007
Fredrick Douglas	Case Western Reserve University	Computer Science	2007
Chiderah Okoye	Case Western Reserve University	Biomedical Engineering	2007
Delmer Lopez	Case Western Reserve University	Chemistry	2006
Evgeniy Tkachenko	Case Western Reserve University	Mechanical Engineering	2005-2009

Undergraduate Student Mentoring (Junior and Senior Projects)

Name	University	Junior Project Senior Project (Department)	Years
Do Hyun “Raymond” Chung	Cornell University	Senior Project (MAE)	2015
Paul Scilingo	Cornell University	Senior Project (MAE)	2011
Jennifer Doughty	Cornell University	Senior Project (MAE)	2011-2012
Chris Center	Case Western Reserve University	Senior Project (MAE)	2009
Jennifer Brinkman	Case Western Reserve University	Senior Project (MAE)	2009
Kenneth Hornfeck	Case Western Reserve University	Senior Project (MAE)	2009
Andrew Renckly	Case Western Reserve University	Senior Project (MAE)	2009
Xiaoxin Zhu	Case Western Reserve University	Junior Project (BME)	2009
Monica Clark	Case Western Reserve University	Junior Project (BME)	2009

Victoria Ma	Case Western Reserve University	Senior Project (MAE)	2007-2008
Tim O'Conner	Case Western Reserve University	Senior Project (MAE)	2007
Mark Shoukry	Case Western Reserve University	Senior Project (BME)	2007-2008
Eric Rodriguez	Case Western Reserve University	Senior Project (BME)	2008
Alex Sira	Case Western Reserve University	Senior Project (MAE)	2008
Tony Rotella	Case Western Reserve University	Senior Project (MAE)	2008
Adam Leiferman	Case Western Reserve University	Junior Project (MAE)	2007
Matt Somner	Case Western Reserve University	Junior Project (MAE)	2007
Michael Wiehagen	Case Western Reserve University	Senior Project (MAE)	2006
Anthony Nalley	Case Western Reserve University	Senior Project (MAE)	2006
Julio Oro	Case Western Reserve University	Senior Project (MAE)	2006
Amanda Putnam	Case Western Reserve University	Senior Project (MAE)	2006
Zachary Moore	Case Western Reserve University	Senior Project (MAE)	2006
Robert Malinoski	Case Western Reserve University	Senior Project (MAE)	2006
Kent Seaburn	Case Western Reserve University	Junior Project (MAE)	2006
Fred Mayse	Case Western Reserve University	Junior Project (MAE)	2006
David Loomis	Case Western Reserve University	Junior Project (MAE)	2006
Micah Thau	Case Western Reserve University	Junior Project (MAE)	2006
Jacob Crandall	Case Western Reserve University	Senior Project (MAE)	2006
Hunter Ewan	Case Western Reserve University	Senior Project (MAE)	2006

Awards Received by Trainees

Post-doctoral and Graduate Trainees

Macy Castaneda

Ford Foundation Predoctoral Fellowship 2020

Christine E. Harper

Whetten Memorial Award, Cornell Center for Nanoscience & Technology (CNF) 2020

National Science Foundation Graduate Research Fellowship 2019

Melanie F. Roberts

Whetten Memorial Award, Cornell Center for Nanoscience & Technology (CNF) 2017

Marysol Luna

Bouchet Society Member, 2019

Finalist, Student Paper Award, World Congress of Biomechanics, 2018

National Science Foundation Graduate Research Fellowship 2017

Jason Guss

Best Presentation, Orthopaedic Research Society Preclinical Models Section, 2018

1st place, 3 Minute Thesis Competition, Cornell University, 2018

American Society for Bone and Mineral Research Young Investigator Travel Award 2016

Jonathan Matheny

National Science Foundation Graduate Research Fellowship, 2013

Ashley Torres

European Society of Biomechanics Student Award Finalist, 2017

Bouchet Society Member, 2016

Best Poster, Society of Hispanic Professional Engineers RISE Symposia, 2015

Kappa Delta/ORS Travel Award 2015
National Science Foundation Graduate Research Fellowship 2013

Erin Cresswell (Litts)

American Society for Bone and Mineral Research Young Investigator Travel Award 2016
National Science Foundation Graduate Research Fellowship 2013

Floor M. Lambers, Ph.D.

Travel Award, International Society of Bone Morphometry, 2012

Meagan Cotter

Alice L. Jee Student Travel Award, Sun Valley Workshop on Musculoskeletal Biology, 2010

Craig R. Slyfield,

Alice L. Jee Student Travel Award, Sun Valley Workshop on Musculoskeletal Biology, 2010

Undergraduate Trainees

Laura Vasquez-Bolanos (current, Ph.D. student UCSD)

National Science Foundation Graduate Research Fellowship 2019

Sebastian Roubert (current, Ph.D. student Harvard)

National Science Foundation Graduate Research Fellowship 2018

Lucy Wang (current, Ph.D. student Stanford)

National Science Foundation Graduate Research Fellowship 2017

Thu Nguyen (current, Ph.D. candidate Stanford)

National Science Foundation Graduate Research Fellowship, 2016

Kyle Niemeyer (current, Assistant Professor, Oregon State University)

National Science Foundation Graduate Research Fellowship, 2010

Teaching

Cornell University

Course	Title	Units	Level	Enrollment
MAE/BME 4640 – Spring 2019	Orthopaedic Tissue Mechanics	3	Undergrad – Elective	24
MAE/BME 4640 – Spring 2018	Orthopaedic Tissue Mechanics	3	Undergrad – Elective	31
MAE/BME 4640 – Spring 2017	Orthopaedic Tissue Mechanics	3	Undergrad – Elective	31
MAE/BME 4640 – Spring 2017	Orthopaedic Tissue Mechanics	3	Undergrad – Elective	29
MAE 2120 – Spring 2016	Mechanical Properties and Selection of Engineering Materials	3	Undergrad – Required for Mechanical Engineering	122
MAE 6640 – Fall 2015	Mechanics of Bone	3	Grad	9

MAE 2120 Spring 2015	Mechanical Properties and Selection of Engineering Materials	3	Undergrad – Required for Mechanical Engineering	157
MAE 6640 Fall 2014	Mechanics of Bone	3	Grad	15
MAE 2120 Spring 2013	Mechanical Properties and Selection of Engineering Materials	3	Undergrad – Required for Mechanical Engineering	152
MAE 6640 Fall 2012	Mechanics of Bone	3	Grad	10
MAE 2120 Spring 2012	Mechanical Properties and Selection of Engineering Materials	3	Undergrad – Required for Mechanical Engineering	154
MAE 6640 Fall 2011	Mechanics of Bone	3	Grad	14
MAE 6640 Fall 2010	Mechanics of Bone	3	Grad	9

Case Western Reserve University

Course	Title	Units	Level	Enrollment
EMAE 689 Spring 2010	Special Topics Cell Biomechanics	3	Grad Covered 1/3 of class	7
EMAE 376 Spring 2010	Aerostructures	3	Undergrad – Upper Required for AE	29
EMAE 372 Fall 2009	Relation of Materials to Design	4	Undergrad – Upper Required for Biomechanics Track	15
EMAE 376 Spring 2009	Aerostructures	3	Undergrad – Upper Required for AE	20
EMAE 372 Fall 2008	Relation of Materials to Design	4	Undergrad – Upper Required for Biomechanics Track	20
EMAE 415 Spring 2008	Introduction to Musculoskeletal Biomechanics	3	Grad	7
EMAE 376 Spring 2008	Aerostructures	3	Undergrad – Upper Required for AE	26
EMAE 372 Fall 2007	Relation of Materials to Design	4	Undergrad – Upper Required for Biomechanics Track	19
EBME 105 Fall 2007	Introduction to Biomedical Engineering	3	Undergrad Covered 1/3 of class	120
EMAE 376 Spring 2007	Aerostructures	3	Undergrad – Upper Required for AE	16
EMAE 376	Aerostructures	3	Undergrad – Upper	28

Spring 2006			Required for AE	
EMAE 372 Fall 2006	Relation of Materials to Design	4	Undergrad – Upper Required for Biomechanics Track	16

Course Descriptions

Cornell University

MAE/BME 4640: Orthopaedic Tissue Mechanics. This is a senior/master's student elective course covering the mechanical properties of tissues from the musculoskeletal system and orthopaedic implants.

MAE 2120: Mechanical Properties and Selection of Engineering Materials. This is a required course for a B.S. in mechanical engineering. It is a second semester solid mechanics course covering three dimensional stress states, introduction to fatigue, introduction to fracture mechanics, a design based material selection.

MAE 6640: Mechanics of Bone. This is a graduate level course covering the mechanical properties of bone and other mineralized tissues and interactions between bone structure and biology. A multiscale approach is taken ranging from whole bone structure across organisms to nano-scale effects on bone tissue mechanical performance.

Case Western Reserve University

EMAE 372: Relation of Materials to Design. A four unit course covering the design of mechanical and structural elements considering static failure, residual stresses, stress concentration, impact, fatigue, creep and environmental conditions on the mechanical behavior of engineering materials. Laboratories include materials testing (tension, bending, notch impact, fracture toughness).

EMAE 376: Aerostructures. A three unit course covering mechanical analysis of thin walled structures and pressure vessels, and introduction to finite element analysis and design and construction of novel, airworthy micro-air vehicles.

EMAE 415: Introduction to Musculoskeletal Biomechanics. A three unit graduate course introducing students to biomechanical analysis of the musculoskeletal system and mechanical properties of musculoskeletal tissues.

EMAE 689: Special Topics: Cell Biomechanics. A three unit graduate course introducing students to biomechanical cells. Provided three weeks of lectures, homework and exam material related to the biomechanics of bacteria.

EBME 105: Introduction to Biomedical Engineering. A three unit course for first year engineering students meant to introduce them to the field of biomedical engineering. Provided 9 lectures on Biomechanics, Biomaterials and Tissue Engineering, created two homework assignments and 1 exam.

Additional Instruction

EMAE 283: Mechanical Engineering Laboratory. This two-unit course involved open-ended laboratory projects in faculty laboratories. I provided laboratory projects in Spring 2006, Spring 2007 and Spring 2010.

- 2006 Students performed a four-point bending test of a whole bone model made of polymer. Students used a screw-driven Instron device and strain gage data acquisition to test composite beam theory calculations.
- 2007 Students developed testing fixtures to perform three point bending tests on rodent femurs and performed the tests using a Bose electroforce testing device.
- 2009 Students developed a new polymer embedding media for use with bone.

EBME 405: Biomaterials for Prosthetic and Orthotic Use. A three-unit graduate course examining the manufacture and material properties of orthopaedic tissues and biomaterials used for their replacement. Provided a guest lecture. Fall 2008.

PHOL512: Skeletal Biology. Provided 1 week of lectures/discussion on the topic "Osteocytes and Mechanotransduction in Bone." Spring 2007.

Surgical Anatomy: Musculoskeletal: A short course for medical students concentrating on musculoskeletal tissue. Provided 1 lecture each term on biomechanics of orthopaedic tissues. Fall 2006-2010

Orthopaedic Resident Education: A short course covering topics key to licensure in Orthopaedic Surgery. Provided 1 lecture each year to orthopaedic residents. Fall 2006-2010

Orthopaedic Grand Rounds: Provided grand rounds lectures to residents on Biomechanics, Biomaterials, Bone Regeneration and Repair (3 different lectures, 1-2 per year, 2006-2010)

Instructor, University of California, Berkeley.

ME176: Orthopaedic Biomechanics. Provided 1 week of lectures and a homework assignment.

ME 107b: Mechanical Engineering Laboratory. Students use a mechanical testing device to evaluate the mechanical properties of synthetic bone and aluminum and use asymmetric composite beam theory to predict mechanical strain in an entire synthetic bone with and without and aluminum intermedullary rod. Lectured, led laboratory sessions and graded assignments through entire semester. Spring 2003.

Teaching Assistant Stanford University

ME 281: Orthopaedic Biomechanics and ME 282: Biomechanics Projects. Graded assignments (research papers), gave two guest lectures, assisted students in organizing projects. Fall, Winter, Spring 1997-1998

Teaching Assistant, Phillips Academy Andover (MS)² program

Discrete Mathematics and Calculus: Gave three guest lectures. Graded homework, lead daily review sessions. Summer 1996.

Professional Service

Orthopaedic Research Society

Board of Directors, 2018-2020

Chair, Membership Committee, 2018-2020

Member, Membership Committee, 2016-2020

Panelist, ORS Sun Valley Skeletal Biology Workshop, 2017

Presenter, Professional Development Session, ORS Sun Valley Workshop 2014

Program Committee Member, 2015-2016

Session Moderator Annual Meeting 2007, 2010, 2019

Abstract Reviewer Annual Meeting 2007, 2009, 2011, 2012

Professional Development Seminars

“How to make the most of your sabbatical” Phoenix, AZ, USA. March 2020.

“Diversifying your candidate pool” New Orleans, LA, USA. March 2018.

American Society for Bone and Mineral Research

Councilor (Board of Directors) 2020- Present

Program Committee 2021

Nominating Committee, 2019

Diversity in Bone and Mineral Research Subcommittee

Member, 2013-2019

Co-Chair, 2016-2019. Promoted Diversity and Inclusion efforts at Council meetings, organized annual diversity reception at the national meeting. Nominated and promoted URM society members to leadership positions.

Professional Development Seminars

Webinar: Bone and the Microbiome (February 2020)

Meet the Professor Seminar, Orlando, FL, September 2019

“5 Ways Social Media Can Boost Your Career: The Fundamentals of Social Media in Science” Professional Development Webinar Series. (March 2018)

<http://www.asbmr.org/courses/launch/9f5c20f3-91bc-4c00-8574-61363ee7b64d/aadf1138-41cc-435f-9cc6-7b5a9c533398>

Meet the Professor Seminar, Houston, TX, USA 2014

National Institutes of Health

NIDDK

Special Emphasis Review Panel Fall 2009

NIAMS

Ad hoc Reviewer SBSR Study Section (R awards), Summer 2017, Winter 2018

Ad hoc Reviewer PPMOSS Study section (F awards), Fall 2017

Standing Member, ASM Study Section (K awards) 2012-2014

International Bone and Mineral Society Sun Valley Workshop

Member, Steering Committee, 2010-2013

International Society of Bone Morphology

Steering Committee Member, 2012-2015

Abstract Reviewer for International Meeting, 2012

National Science Foundation

Panelist Fall 2008, Spring 2009, Spring 2011, Spring 2012, Spring 2015, Spring 2018

National Evolutionary Synthesis Center (NESCent)

2012-2015 Invited Participant “The Perils of Being Bipedal: An Evolutionary Perspective on Human Musculoskeletal Disorders.”

American Society of Mechanical Engineers

Session Co-Chair Summer Bioengineering Meeting, 2011

Abstract Reviewer Summer Bioengineering Meeting 2008. 2011

Biomedical Engineering Society

2009 Co-chair Session Entitled “Bone Mechanics and Adaptation”

2008 Co-chair Session Entitled “Bone Mechanics and Adaptation”

Referee for Bone, Journal of Biomechanics, Journal of Biomechanical Engineering, Journal of Bone and Mineral Research, Clinical Biomechanics, Biomechanics and Modeling in Mechanobiology, Clinical Pharmacokinetics, Journal of Bone and Joint Surgery, Engineering Fracture Mechanics, Computer Methods in Biomechanics and Biomedical Engineering, Proceedings of the National Academy of Sciences

Member of the American Society for Bone and Mineral Research, the Orthopaedic Research Society, American Society of Mechanical Engineers, Biomedical Engineering Society, Society of Hispanic Professional Engineers and the American Association for the Advancement of Science.

University Service

Cornell University

Department

2017-2020 Director of Graduate Studies, Mechanical Engineering

- 2017-2020 Associate Director for Graduate Affairs, Sibley School of Mechanical and Aerospace Engineering
Led the PhD program in Mechanical Engineering (rated within the top 10 in the U.S.). Led new student orientation, student-mentor matching, academic requirements, long-term strategy for the graduate program.
- 2015-2016 Member, Computational Mechanics Search Committee
- 2014-2016 Program Committee Member
- 2014-2015 Chair, Biomechanics Search Committee
- 2014-2015 Graduate Admissions Committee Biomedical Engineering
- 2011-2012 Chair, Graduate Programs Committee
- 2010-2012 Graduate Admissions Committee, Mechanical Engineering
- 2010-2011 Secretary of the Faculty

College

- 2019-Present Member, Advisory Board, Cornell Sloan University Center for Exemplary Mentoring

University

- 2019 Chair, Graduate Grievance Review Board (Summer 2019)
- 2018-Present Member and **Chair** (2018-2020), Research Advisory Committee. The Research Advisory Committee provides internal reviews for research proposals that limit the number of submissions from each institution.
- 2011 – 2017 Faculty in Residence. As a faculty member living within the first year dormitory, promoted the living-learning environment. I lead a team of faculty fellows to provide educational programs within the freshmen residences. I organize and lead two program events each month within the freshmen residences and additionally work with other faculty and professional staff in the New Student Programs. Activities include organizing mixers to get students to meet faculty as well as formal events twice per month promoting cultural awareness and pre-professional activities.

Case Western Reserve University

Department

- 2009-2010 Graduate Admissions Chair

School of Engineering

- 2009-2010 Research Committee
- 2007-2008 Continuing Education Committee
- 2006-2007 Graduate Studies Committee

University

- 2009-2010 President's Advisory Council on Minorities
- 2007-2008 Steering Committee. Research ShowCASE

Stanford University

Coordinator and Community Associate, Multicultural Theme House, Stanford University. Worked to provide a supportive environment for graduate students of color through educational and social events in student residences. 1997-2001.

Resident Fellow. Worked as an advisor and tutor in mathematics and engineering topics to incoming first-year engineering students for Stanford's Summer Engineer Academy. 2000.

Student Coordinator, Biomechanical Engineering Division. Student representative for the Division. Attended faculty meetings, interviewed candidates during a faculty search, developed undergraduate degree curriculum and recruited new graduate students. 1997-1998.

Outreach and Diversity

Society of Hispanic Professional Engineers National Organization

- 2018 Co-chair Faculty Development Institute (a one-day professional development program for assistant professors)
- 2017 Seminar: Career Paths in Engineering, Harvard University SHPE Chapter
- 2015-2016 Faculty presenter at the Faculty Institute (mentoring event for junior engineering faculty) and the Graduate Institute (a mentoring program targeted to current graduate students/post-docs)
- 2016 Past Chair, Scientific Paper/Poster Sessions
- 2011-2015 Chair, Scientific Poster/Poster Sessions
Each year I oversaw three the efforts of 3 other faculty and 3 undergraduate assistants to regarding advertising, web-based abstract submission, abstract review by other faculty, abstract selection, session organization, travel reimbursement.

Cornell University

- 2019 – Latino Studies Program: Fridays with Faculty Lunch Series Presenter
- 2015 – Public Voices Fellow
- 2015 – Latino Studies Program: Friday’s with Faculty Lunch Series Presenter
- 2015 – CATALYST Scientific Program. Created and lead a one-week long laboratory experienced for high school students, predominately students from under-represented groups. The program included instruction in three-point bending, biomechanics, image analysis and statistics.
- 2012 – Present Two annual presentations to the “Ivy League Leadership Program” which brings Hispanic students from rural California to Ivy League Schools (see below).
- 2011 – Present Sloan Mentor. Mentored graduate students in engineering from under-represented groups.
- 2010 – Present Diversity Programs in Engineering. Provided a number of services to Cornell Diversity Programs in Engineering including graduate student recruitment at the Society of Hispanic Professional Engineers meeting, annual presentations for the CU Empower peer-mentoring organization, and to the CATALYST summer engineering/science program for high school students. References: Jami Joyner and Sara Xayarath Hernandez.

Ivy League Leadership Project

The Ivy League Leadership project is an informally networked group of high school instructors who bring students from lower economic parts of the U.S. (predominately Hispanic/Latino) on a week-long tour of Ivy League and sister colleges and universities in the Northeast. The programs all include weekly leadership and college preparation for the students.

- 2013-Present Annual Presenter, Watsonville CA Ivy League Leadership Program
- 2015-Present Annual Presenter, Central Valley CA Ivy League Leadership Program

Case Western Reserve University (2005-2010)

- 2006-2010. Faculty Advisor. Case Western Reserve University Chapter of the National Society of Black Scientists and Engineers.

Stanford University (1996-2001)

Resident Fellow. Worked as an advisor and tutor in mathematics and engineering topics to incoming first-year engineering students for Stanford’s Summer Engineer Academy. 2000.

Graduate Peer Advisor. Advised undergraduates on coursework, research opportunities, technical careers and the graduate school application process. Helped place undergraduates in research assistant positions. 1998-2001.

Professional Advisor, Stanford Society of Chicano/Latino Engineers and Scientists (a chapter of the Society of Hispanic Professional Engineers). Guided officers and student members. 2000-2001.

Graduate Liaison, Stanford Society of Chicano/Latino Engineers and Scientists (a chapter of the Society of Hispanic Professional Engineers). Gave presentations to undergraduates about graduate school career options. 1998-1999.

President, Stanford Society of Chicano/Latino Engineers and Scientists (a chapter of the Society of Hispanic Professional Engineers). Met with industry representatives to solicit financial support and employment opportunities for members. 1999.

Invention Disclosure

Hernandez, C.J., Sun, X.”Microfluidic devices for mechanical testing/stimulating cells” Cornell. U.S. Provisional Patent 61892941.

von Recum H.A., Thatiparti T.R., Korley J. K., Hernandez C.J. “Slow-Release “Slow-Release Antibiotic Gel or Anti-Inflammatory Joint Injection” CWRU #2010-1915

von Recum H.A., Thatiparti T.R., Korley J. K., Hernandez C.J. “Slow-Release Antibiotic Coatings for Orthopaedic Implants” CWRU #2010-1914

Sira A., Tocci T., Marks J.M., Chak A., Trunzo J., Hernandez C.J. “Anti-reflux esophageal stent” CWRU.

O’Conner T., Shoukry M., Marks J.M., Chak A., Hernandez C.J. “Novel method of compressing and expanding stents” CWRU.

Dux S.J., Johnson, N., Kummari, S.R., Hernandez C.J. “Novel Fracture Fixation Device” CWRU.

Hernandez C.J., Gobezie R., Loomis D.A., Liu C.C.. “Smart Orthopaedic Implant that Detects Loosening” CWRU.

Hernandez, C.J., Beaupré, G.S., Marcus, R., Carter, D.R. “Computer Simulation Software for Osteoporosis Drug Treatment” Stanford Office of Technology and Licensing Docket #00-177.