CHRISTINA SALAS, Ph.D, M.Sc.

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CURRICULUM VITAE

DATE: February 10, 2021

PROFESSIONAL ADDRESS:

University of New Mexico Health Sciences Center
Department of Orthopaedics and Rehabilitation
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EDUCATION AND TRAINING:

- **Ph.D. Biomedical Engineering**, University of New Mexico Albuquerque, May 2014
  Honors: Passed dissertation defense with distinction
  Passed comprehensive exam with distinction
  Dissertation: The Trapeziometacarpal Joint: Tissue Characterization and Surgical Techniques for Treatment of Osteoarthritis
  PhD Transcripted Minor: Nanoscience and Microsystems Engineering
  Dissertation Advisor: Mahmoud Reda Taha, PhD
- **NSF Integrative Graduate Education and Research Traineeship (IGERT) Computational Biomechanics**, Mayo Clinic Rochester, Division of Engineering and Technical Services, July 2010-June 2012
- **NSF Integrative Graduate Education and Research Traineeship (IGERT) Experimental Biomechanics**, University of California San Francisco, San Francisco General Hospital Biomechanics Laboratory, January 2009-July 2009
- **M.S. Mechanical Engineering**, University of New Mexico Albuquerque, December 2008
  Honors: Passed thesis defense with distinction
  Thesis: A Biomechanical Comparison of Locked Plates Contrasted with Intramedullary Treatment of Distal Femur Fracture
  Emphasis: Orthopaedic biomechanics/finite element analysis
  B.S. Mechanical Engineering, California State University Chico, May 2005
  Senior Design Project: An Automated Vineyard Irrigation Tank Controller
  Minor: Manufacturing

EMPLOYMENT HISTORY:

- Associate Professor, Tenured, Department of Orthopaedics and Rehabilitation, University of New Mexico Health Sciences Center, Albuquerque, NM, July 2021-present

- Special Assistant to the Dean of Engineering for HSC Relations, School of Engineering, University of New Mexico, Albuquerque, NM, May 2018-present
- Assistant Professor, Department of Orthopaedics and Rehabilitation, University of New Mexico Health Sciences Center, Albuquerque, NM, July 2014-June 2020
- Assistant Professor, Department of Mechanical Engineering, University of New Mexico School of Engineering, Albuquerque, NM, 2015-2020, *secondary faculty appointment*
- Assistant Professor, Department of Civil Engineering, University of New Mexico School of Engineering, Albuquerque, NM, 2014-2020, *adjunct faculty appointment*
- Graduate Research Assistant, Department of Orthopaedics and Rehabilitation, University of New Mexico Health Sciences Center, Albuquerque, NM, 2007-2014, joint assistantship w/SOE
- Graduate Research Assistant, Department of Civil Engineering, University of New Mexico School of Engineering, Albuquerque, NM, 2006-2014, joint assistantship w/SOM
- Undergraduate Researcher in Dental/Medical Device Manufacturing, Lares Research, Chico, CA, 2004-2005

PROFESSIONAL RECOGNITIONS:

- 1 of 50 female awardees nationwide, In Style Magazine, Badass 50: Healthcare Workers Who Are Saving The Day, August/September 2020 https://www.instyle.com/news/badass-women-august-2020
- Angels Among Us award, Albuquerque Journal, September 2020 – for leading 3D printed mask effort for UNM
- 2019 University of New Mexico Health Science Center, Excellence in Research – Junior Faculty category, November 2019
- NIH Future Research Leader Recognition and Conference, National Institutes of Health, May 2019
- Outstanding Women in Technology Award Recipient, New Mexico Technology Council, March 2019
- Finalist: New Investigator Research Award, Orthopaedic Research Society, February 2019
- Recognized for innovation activities on the STC.UNM 2018 Innovation Calendar, Spring 2017
- Women in STEM Faculty Development Award, University of New Mexico, Spring 2016
- Force & Motion Foundation/ORS Young Scientist Travel Award, Orthopaedic Research Society, Spring 2016
- Featured in the UNM School of Engineering Journal, 5 for Christina Salas – intersection of engineering and medicine, Fall 2015
- Outstanding Graduate Student Award for Chemical and Nuclear Engineering, Biomedical Engineering, and Nanoscience and Microsystems Engineering, Spring 2014
- Graduate Student Success Scholarship, University of New Mexico, Spring 2014
- First place poster award in the Medicine and Health Science division; third place poster award overall – New Mexico Shared Knowledge Conference and Research Exposition April 2013
- Featured in Diversity Careers in Engineering & Information Technology magazine in a special edition on Technical Women of Color, April/May 2012
- $60,000 Integrative Graduate Education and Research Traineeship (IGERT) in Nanoscience and Microsystems, National Science Foundation, 2009-2011

- Podium presentation at 18th Symposium on Computational Methods in Orthopaedic Biomechanics selected to be published in a special edition of the International Journal of Computer Methods in Biomechanics and Biomedical Engineering titled Novel Computational Techniques in Orthopaedic Biomechanics (2010; published 2011)
- National Science Foundation Scholarship, California State University, Chico, CA, 2005
- Math, Engineering and Science Achievement (MESA) Programs Scholarship, California State University, Chico, CA, 2004

MEMBERSHIPS IN PROFESSIONAL SOCIETIES:

- American Association for the Advancement of Science, Member (2018-present)
- International Wrist Investigators Workshop (American Society for Surgery of the Hand specialty group), Member (2014-present)
- Southwest Orthopaedic Trauma Association, Member (2014-present)
- Materials Research Society, Member (2014-2017)
- Biomedical Engineering Society, Member (2013-present)
- Orthopaedic Research Society, Active Member (2008-present)
- Sigma Xi Scientific Research Society, Full Member (2010-2014)
- American Society of Mechanical Engineers, Member (2008-2012)

OTHER EXTRAMURAL PROFESSIONAL ACTIVITIES:

- Emprende Latino business accelerator for Latinx entrepreneurs, Design Thinking instructor and technical mentor – 2019-2020
- The Perry Initiative, Advisory Board, Co-Chair – 2018-present
- University of New Mexico Orthopaedic Research Journal, Co-Editor – 2014-present
  Adhoc reviewer for professional journals:
- Journal of Biomedical Materials Research: Part B: Applied Biomaterials manuscript reviewer – 2019 - present
- Journal of Hand and Microsurgery manuscript reviewer – 2017 - present
- American Journal of Hand Surgery manuscript reviewer – 2015 - present
- Journal of Applied Biomaterials – Functional Materials manuscript reviewer – 2015 - present
- Journal of Biomechanics manuscript reviewer – 2015 – present
- Journal of Orthopaedic Research manuscript reviewer – 2014 – present

INVITED LECTURES

- 2019, Advanced Biomanufacturing of the Bone-Ligament Interface, New Mexico Technology Council, November 15, 2019
- 2019, Engineered Scaffolds for Total Joint Replacement, UNM HSC Board of Regents meeting, October 8, 2019
- 2019, 3D Printing of Natural and Synthetic Polymers, UNM SOE/HSC Faculty Club Seminar, September 24, 2019
- 2019, Advanced Biomanufacturing of the Bone-Ligament Interface; Invited Lecture, Future Research Leaders Conference, National Institutes of Health, Bethesda, MD, May 20, 2019.
- 2019, 3D Printing with Near-Field Electrospinning Composite Scaffolds of the Bone-Ligament Interface; Advances in 3D Printing and Biofabrication in Orthopaedics Workshop organized by

the Women's Leadership Forum, Orthopaedic Research Society, Austin, TX, February 2, 2019. (1 of 3 invited presenters)

- 2018, Engineering in orthopaedics (and other medical specialties). UNM Faculty Lightning Lounge.
- 2018, Engineering in orthopaedics (and other medical specialties). UNM MD/PhD Journal Club.

SCHOLARLY ACHIEVEMENTS RELATED TO RESEARCH:

ORIGINAL PEER-REVIEWED RESEARCH ARTICLES IN JOURNALS: (20)

*****Denotes equal contribution, $^{+}$Denotes mentored student

1. Majumdar A, Chavez W, Sapradit TJ, Bankhead C, **Salas C**, Mercer D, Wascher DC, Richter DL. No Significant Difference Between Intramedullary and Extramedullary Button Fixation for Distal Biceps Brachii Tendon Rupture After Cyclic Loading in a Cadaver Model. Arthrosc Sports Med Rehabil. 2021. In Press.
2. Mottishaw L, Rush M, **Salas C**, Fountain D, Wells A L, Mercer D. Engineering the Scapholunate Interface. J Wrist Surg. 2021, In Press.
3. Zamani N^{+}, Pourkand A^{+}, **Salas C**, Mercer D, Grow D. A novel approach for assessing and training the drilling skills of orthopaedic surgeons. J Bone Joint Surg Am. 2019;101(16):e82.
4. Rush MN^{+}, Hagin E^{+}, Nguyen J^{+}, Lujan V^{+}, Dutton RA, **Salas C**. Design for transtibial modifiable socket for immediate postoperative prosthesis. UNM Orthopaedic Research Journal. 2019; 8(1): 93-97. https://digitalrepository.unm.edu/unm_jor/vol8/iss1/1/
5. Treme GP, **Salas C**, Ortiz G^{+}, Gill GK^{+}, Johnson PJ^{+}, Menzer H^{+}, Richter DL, Qeadan F, Wascher DC, Schenck RC. A biomechanical comparison of the Arciero and LaPrade reconstruction for posterolateral corner knee injuries. Orthop J Sports Med. April 15, 2019. https://doi.org/10.1177/2325967119838251.
6. **Salas C**, Brantley JA^{+}, Clark J^{+}, Reda Taha M, Mercer D. Damage in a distal radius fracture model treated with locked volar plating after simulated postoperative loading. J Hand Surg Am. 2018 Jul; 43(7):679.e1-679.e6. PubMed Central PMCID: PMC6035079.
7. **Salas C**, Howdieshell T, Tufaro R^{+}, Long L^{+}, Mauser A^{+}, Kondapi A^{+}, Aboubakr S^{+}. Pelvic ring emergency stabilization system (PRESS). UNM Orthopaedic Research Journal. 2018;7(1):82-86. https://digitalrepository.unm.edu/unm_jor/vol7/iss1/1/
8. Zamani N^{+}, Luo B, Pourkand A^{+}, **Salas C**, Mercer D, Grow D. Patterns in bone drilling performance before and after the 2017 motor skills course of the southwest orthopaedic trauma association. UNM Orthopaedic Research Journal. 2018;7(1)75-81. https://digitalrepository.unm.edu/unm_jor/vol7/iss1/1/
9. Moneim MS, **Salas C**, Lese AB^{+}, Thompson NB^{+}, Mercer DM. Long-term Outcomes of Partial Trapeziectomy With Capsular Interposition Arthroplasty for Osteoarthritis of the Thumb Basal Joint. Orthopedics. 2018 Mar 1;41(2):e228-e233. doi: 10.3928/01477447-20180123-03. Epub 2018 Jan 29. PubMed PMID: 29377052.
10. Pourkand A^{+}, **Salas C**, Regalado J^{+}, Bhakta K, Tufaro R^{+}, Mercer D, Grow D. Objective evaluation of motor skills for orthopaedic residents using a motion tracking drill system. Outcomes from an ABOS approved surgical skills training course. Iowa Orthop J. 2016;36:13-19.
11. **Salas C**, Mercer D, O'Mahony G^{+}, Love J, LaBaze D^{+}, Moneim MS. Thumb metacarpal subsidence after partial trapeziectomy with capsular interposition arthroplasty: A biomechanical study. Hand (NY). 2016;11(4):444-449.

12. Brantley J[+], Majumdar A[+], Jobe JT[+], Kallur A, **Salas C**. A biomechanical comparison of pin configurations used for percutaneous pinning of distal tibia fractures in children. Iowa Orthop J. 2016;36:133-137.
13. Evans S[+], Brantley J[+], Brady C[+], **Salas C**, Mercer D. Structures at risk during volar percutaneous fixation of scaphoid fractures: A cadaver study. Iowa Orthop J. 2015;35:119-123.
14. Dickens AJ*[+], **Salas C***, Rise L[+], Murray-Krezan C, Taha MR, DeCoster TA, Gehlert RJ. Titanium mesh as a low-profile alternative for tension-band augmentation in patella fracture fixation: A biomechanical study. Injury. 2015;46(6):1001-1006.
15. Dragomir-Daescu D*, **Salas C***, Uthamaraj S, Rossman T. Quantitative computed tomography-based finite element analysis predictions of femoral strength and stiffness depend on computed tomography settings. J Biomech. 2015;48(1):153-161.
16. Cheema T, **Salas C**, Morrell N, Lansing L, Reda Taha MM, Mercer D. Opening wedge trapezial osteotomy as possible treatment for early trapeziometacarpal osteoarthritis: A biomechanical investigation of radial subluxation, contact area, and contact pressure. J Hand Surg Am. 2012 Apr; 37(4): 699-705.
17. **Salas C**, Mercer D, DeCoster TA, Reda Taha MM. Experimental and probabilistic analysis of distal femoral periprosthetic fracture: a comparison of locking plate and intramedullary nail fixation. *Part A: experimental investigation*. Comput Methods Biomech Biomed Eng. 2011 Feb;14(2):157-164.
18. **Salas C**, Mercer D, DeCoster TA, Reda Taha MM. Experimental and probabilistic analysis of distal femoral periprosthetic fracture: a comparison of locking plate and intramedullary nail fixation. *Part B: probabilistic investigation*. Comput Methods Biomech Biomed Eng. 2011 Feb;14(2):175-182.
19. Dragomir-Daescu D, Op Den Buijs J, McEligot S, Dai Y, Entwistle R, **Salas C**, Melton LJ 3rd, Bennet K, Khosla S, Amin S. Robust QCT/FEA models of proximal femur stiffness and fracture load during a sideways fall on the hip. Ann Biomed Eng., 2011; 39(2): 742-755.
20. Afifi A, Medoro A, **Salas C**, Reda Taha MM, Cheema T. A novel cadaver model investigating irreducible metacarpophalangeal joint dislocation, J Hand Surg Am, 2009; 34(8): 1506-1511.

PEER-REVIEWED CONFERENCE PUBLICATIONS AND PUBLISHED ABSTRACTS: (8)
[+]Denotes mentored student

1. Majumdar A[+], Chavez W[+], Valdez J[+], Sapradit T[+], **Salas C**, Bankhead C[+], Mercer D, Richter DL. Unicortical versus bicortical button fixation for distal biceps brachii tendon rupture: A cadaveric biomechanical study. Orthop J Sports Med. 2019 July 1;7(7_suppl5). https://doi.org/10.1177/2325967119S00366
2. Glatz B, **Salas C**, Grow D, Coffee B, Baca J, "Bariatric Lift Prototype" in "Abstracts for the 2019 NAEMSP Scientific Assembly" Prehospital Emergency Care, 2019, 23(1): 97-152, DOI: 10.1080/10903127.2018.1521488
3. Treme G, Ortiz G[+], Gill GK[+], Menzer HM[+], Johnson PJ[+], **Salas C**, Qeadan F, Schenck RC, Richter DL, Wascher DC. A biomechanical comparison of knee stability after posterolateral corner reconstruction: Arciero vs. LaPrade. Orthop J Sports Med. 2017;5(7) (suppl 6).
4. Aboubakr S[+], **Salas C**, Taha MMR. Low velocity impact strength of CFRP composites incorporating nanoclay. American Society for Composites 30th Technical Conference (2015), East Lansing, MI.
5. Mercer D, **Salas C**, Love J, Lansing L[+], Medoro A[+], Reda Taha MM, Cheema T. Simulated osteotomy of the trapezium reduces radial subluxation and improves contact pressure distribution across the thumb carpometacarpal joint in lateral pinch, American Society of Mechanical Engineers Summer Bioengineering Conference, Naples, FL, June 2010.

6. **Salas C**, DeCoster T, Mercer D, Firoozbakhsh K, Reda Taha MM. Examining damage accumulation in osteoporotic distal femur fracture repair, Society for Experimental Mechanics 2009 Annual Conference & Exposition on Experimental & Applied Mechanics, Albuquerque, NM
7. Neidigk S, **Salas C**, Soliman E, Mercer D, Reda Taha MM. Creep and relaxation of osteoporotic bone, Society for Experimental Mechanics 2009 Annual Conference & Exposition on Experimental & Applied Mechanics, Albuquerque, NM
8. **Salas C**, Marmor M, Chu T, Hansma P, Matityahu A, Buckley J. Assessment of Local Bone Quality of the Distal Radius Using a Novel Hard Tissue Diagnostic Instrument, American Society of Mechanical Engineers Summer Bioengineering Conference, Lake Tahoe, CA, June 2009.

INVITED BOOK CHAPTERS: (2)

1. **Salas C**. "Tissue specific applications: Ligament and tendon entheses." 3D Bioprinting Applications in Tissue Engineering and Regenerative Medicine. Springer. To be submitted May, 2021.
2. **Salas C**. "Enabling technology: Hybrid spinning-spraying-printing systems." 3D Bioprinting Applications in Tissue Engineering and Regenerative Medicine. Springer. To be submitted May, 2021.

OTHER RESEARCH ARTICLES/ABSTRACTS: (6)

[+]Denotes mentored student

1. **Salas C**, Hoopes D[+], Reda Taha MM, DeCoster TA. External fixation for treating tibial shaft fractures using a triangular two-planar frame: A computational and biomechanical study. UNM Orthopaedic Research Journal. 2017;6(1):81-90. https://digitalrepository.unm.edu/unm_jor/vol6/iss1/1/
2. Aboubakr S[+], Nery S[+], Long L[+], Buksa C[+], Fritch C[+], **Salas C**. 3D bioprinter + electrospinner for bone-ligament tissue engineering. UNM Orthopaedic Research Journal. 2017;6(1):110-116. https://digitalrepository.unm.edu/unm_jor/vol6/iss1/1/
3. Gomez J[+], Mroczkowski J, Long L[+], Buksa C[+], Mercer D, **Salas C**, Grow D. Automated device to enable passive pronation and supination activities of the hand for experimental testing with cadaveric specimens: A collaboration between the University of New Mexico and New Mexico Institute of Mining & Technology. UNM Orthopaedic Research Journal. 2017;6(1):117-123. https://digitalrepository.unm.edu/unm_jor/vol6/iss1/1/
4. Long L[+], **Salas C**, Mercer D, Silva S, Knigge J[+]. Pilot study investigating the use of 3D printing in designing upper-extremity prosthetics for children: A pilot study. UNM Orthopaedic Research Journal. 2017;6(1):124-128. https://digitalrepository.unm.edu/unm_jor/vol6/iss1/1/
5. Moneim M, Lese A[+], Thompson N[+], **Salas C**, Mercer D. Long-term clinical and radiological outcome following partial trapeziectomy and capsular interposition for the treatment of thumb carpometacarpal joint arthritis. J Wrist Surg. 2015; 04-A029. DOI: 10.1055/s-0035-1567921.
6. Mercer D, Moneim M, Salas C. High resolution motion analysis for identification of primary trapeziometacarpal joint stabilizers during grip motions. J Wrist Surg. 2015; 04-A013. DOI: 10.1055/s-0035-1545651.

PUBLICATIONS IN REVIEW: (3)

[+]Denotes mentored student

1. Garbrecht E, Nguyen PAH[+], Eghazali N[+], Hill D, Canavan HE, **Salas C**, Decker M. Ex vivo human chondrocyte toxicity after exposure to tranexamic acid. J Bone Joint Surg. Submitted.
2. **Salas C**, Telis A[+], Tufaro R[+], McIver N[+], Mercer D. The h-taping method as a preventative measure against or treatment for A2 pulley tears during rock climbing: A biomechanical study. Am J Sports Med. Submitted.

3. Garbrecht E, Nguyen PAH[+], Eghazali N[+], Hill D, Canavan HE, **Salas C**, Decker M. Ex vivo human chondrocyte toxicity after exposure to intraoperative antiseptics and antibiotics. J Am Acad Orthop Surg. Submitted.
4.

PUBLICATIONS IN PREPARATION: (5)

[+]Denotes mentored student

1. Rush M[+], Elghazali N[+], Buksa C[+], Mottishaw L[+], Perez M[+], **Salas C**. Multimodal manufacturing of bone-ligament-bone composite scaffolds. Tissue Eng Part A.
2. **Salas C**, Carlston C[+], Dexter J, Reda Taha MM, Orbay J, Mercer D. Kinematic analysis of the thumb carpometacarpal joint in lateral pinch and grip. Hand. Expected submission 11/30/19.
3. **Salas C**, Reda Taha MM, Orbay J, Vernon L, Mercer D. Morphometric, mechanical, and histological characterization of the trapeziometacarpal joint ligaments. J Hand Surg Am. Expected submission 11/30/19.
4. Richter DL, McIver N[+], Sapradit T[+], Garcia J[+], Mercer R, Schenck R, **Salas C**, Treme G. A biomechanical analysis of a new technique for medial collateral ligament reconstruction. Am J Sports Med. Expected submission 12/15/19.

CONTRIBUTED ABSTRACTS AND ORAL PRESENTATIONS AT PROFESSIONAL MEETINGS: (52)

[+]Denotes mentored student

1. McIver N[+], Sapradit T[+], Garcia J[+], Mercer R[+], Schenck R, Treme G, Richter D, **Salas C**. A Biomechanical Analysis of a New Technique for MCL Reconstruction. 66th Annual Meeting of the Orthopaedic Research Society, Phoenix, AZ, February 8-11, 2020.
2. Majumdar A[+], Chavez W[+], Valdez J[+], Sapradit T[+], Bankhead C[+], **Salas C**, Mercer D, Richter D. Unicortical versus bicortical button fixation for distal biceps brachii tendon rupture: A cadaveric biomechanical study. 12th Biennial International Society of Arthroscopy, Knee Surgery, & Orthopaedic Sports Medicine (ISAKOS) Congress, Cancun, Mexico, May 12-16, 2019.
3. Elghazali N[+], Rush M[+], Garcia E[+], Buksa C[+], Perez M[+], Trujillo R[+], Lopez S[+], **Salas C**. Bio-3D Printing and Near-Field Electrospinning of Bone-Ligament Tissue Engineering Scaffolds. Society for Biomaterials 2019 Annual Meeting & Exposition, Seattle, WA, April 3-6, 2019. Rapid Fire Talk.
4. **Salas C**, Regalado J[+], Mejias-Morales D[+], Vakharia K[+], Prieto F[+], Mercer D. Low-profile mesh as an alternative to tension band wire treatment for olecranon fractures and osteotomies: A biomechanical comparison. **New Investigator Recognition Award Finalist**. 65th Annual Meeting of the Orthopaedic Research Society, Austin, TX, February 2-5, 2019.
5. Mercer D, Mejias-Morales D[+], **Salas C**, Regalado J[+], Gilligan P[+], Johnson J[+], Long L[+]. A biomechanical analysis of partial extensor tendon lacerations >50% in zone V: Is surgical intervention necessary? 2019 American Association for Hand Surgery Annual Meeting, Palm Desert, CA, January 30 – February 2, 2019.
6. Mercer D, Moneim M, **Salas C**. The New Mexico approach for the surgical treatment of thumb basal joint osteoarthritis: 2006-present. 3rd International Thumb Osteoarthritis Workshop, Stanford, CA, November 9-10, 2018.
7. **Salas C**, Regalado J[+], Mejias-Morales D[+], Prieto F[+], Vakharia K[+], Mercer D. Titanium mesh as a low-profile alternative to tension band wiring for repairing olecranon fractures. 2018 Biomedical Engineering Society Annual Meeting, Atlanta, GA, October 2018.
8. **Salas C**, Mercer D. Advanced biomanufacturing of bone-soft tissue composite scaffolds for carpal ligament regeneration. International Wrist Investigators Workshop 2018, Boston, MA, September 12, 2018.

9. Regalado J[+], Prieto F[+], Mejias-Morales D[+], Vakharia K[+], Mercer D, **Salas C**. Low-profile mesh plating for treating olecranon fractures and osteotomies: A biomechanical evaluation. Western Orthopaedic Association 2018 Annual Meeting, Snowmass, Colorado, August 1-4, 2018.
10. Mejias-Morales D[+], Regalado J[+], Long L[+], Johnson B[+], Johnson J[+], Gilligan P[+], Mercer D, **Salas C**. Should we repair extensor tendon lacerations <50% of tendon width in zone V? Western Orthopaedic Association 2018 Annual Meeting, Snowmass, Colorado, August 1-4, 2018.
11. Nery S[+], Hamilton A[+], Mercer D, **Salas C**. "Smart" pedicle probe for residency motor skills evaluation & training: A pilot study. Western Orthopaedic Association 2018 Annual Meeting, Snowmass, Colorado, August 1-4, 2018.
12. Gomez J[+], Pollard T[+], Newhoff D[+], Gauger E[+], Orbay JL, Mercer D, Grow D, **Salas C**. Radial head instability and limited hand rotation after simulated interosseous membrane injury. Western Orthopaedic Association 2018 Annual Meeting, Snowmass, Colorado, August 1-4, 2018.
13. Schenck R, Treme G, Ortiz G[+], Johnson PJ[+], Menzer H[+], Gill GK[+], **Salas C**, Richter D, Wascher D, Mercer D. A biomechanical comparison of the Arciero and Laprade techniques for knee posterolateral corner reconstruction. 70th Annual Meeting of The Association of Bone and Joint Surgeons, Lisbon, Portugal, May 2018.
14. Mercer D, **Salas C**, Gomez J[+], Newhoff D[+], Gauger E[+], Pollard T[+], Long L[+,] Grow D, Orbay JL. Radial head multi-axial instability during active pronosupination after annular ligament and interosseous membrane sectioning. 70th Annual Meeting of The Association of Bone and Joint Surgeons, Lisbon, Portugal, May 2018.
15. **Salas C**, Mejias Morales D[+], Nery S[+], Buksa C[+], Garcia E[+], Mauser A[+], Prieto F[+], Rush M[+], Fritch C[+]. 3D Bioprinting+Electrospinning Hybrid System for Functionally-Graded Scaffolds of the Bone-Ligament Interface. 2018 Materials Research Society Spring Meeting & Exhibit, Phoenix, Arizona, April 2018.
16. Gomez J[+], **Salas C**, Newhoff D[+], Pollard TG[+], Gauger E[+], Long L[+], Orbay J. Quantification of the multi-axial stability of the radial head after annular ligament and interosseous membrane sectioning. American Association for Hand Surgery 2018 Annual Meeting. Phoenix, AZ, January 2018.
17. **Salas C**, Nery S[+], Buksa C[+], Aboubakr S[+], Fritch C[+], Alvarez C[+], Mauser A[+], Mercer D, Moneim M. Hybrid 3D bioprinting/electrospinning: Application to hand and wrist surgery. International Wrist Investigators Workshop 2017, San Francisco, CA, September 2017.
18. **Salas C**, Aboubakr S[+], Nery S[+], Buksa C[+]. Hybrid 3D bioprinting/electrospinning: Application to hand and wrist surgery. American Society for Surgery of the Hand 72nd Annual Meeting, San Francisco, CA, September 2017.
19. Johnson P[+,] Ortiz G[+], Menzer H[+], Gill GK[+], Schenck R, Treme G, Qeadan F, **Salas C**. A biomechanical comparison of Arciero and LaPrade techniques for knee posterolateral corner reconstruction. Western Orthopaedic Association 2017 Annual Meeting, Kauai, HI, August 2-5, 2017.
20. Ortiz G[+], Menzer H[+], Gill GK[+], Johnson P[+], Schenck R, Treme G, Qeadan F, **Salas C**. A biomechanical comparison of Arciero and LaPrade techniques for knee posterolateral corner reconstruction. The American Orthopaedic Society for Sports Medicine, Toronto, CA, July 20-23, 2017.
21. Mercer D, Peterson DE[+], **Salas C**, Moneim M. Percutaneous pinning through the anatomic snuff box: extrapolating the safe zone to surface landmarks. 69th Annual Meeting of The Association of Bone and Joint Surgeons, Austin, TX, April 2017.

22. Tufaro R[+], Telis A[+], Larson D[+], Mercer D, **Salas C**. The H-taping method for prophylactic or temporary fixation of partial A2 pulley tears during rock climbing: A biomechanical study. Biomedical Engineering Society 2016 Annual Meeting, Minneapolis, MN, October 2016.
23. Gomez J[+], Tufaro R[+], Pourkand A[+], Grow D, **Salas C**. Sensitivity of bone mineral density measurements to axial rotations and scan analysis in dual energy X-ray absorptiometry of the lateral distal femur. Biomedical Engineering Society 2016 Annual Meeting, Minneapolis, MN, October 2016.
24. Mercer D, Larson D[+], Paffett C[+], Romero J[+], Neher L, **Salas C**. Pronator quadratus rotational muscle flap to limit flexor tendon injury from VDR plate fixation. International Wrist Investigators Workshop 2016, Austin, TX, September 2016.
25. Moneim M, Mercer D, Peterson E[+], **Salas C**. Percutaneous pinning through the anatomic snuff box: Extrapolating the "safe zone" to surface landmarks. International Wrist Investigators Workshop 2016, Austin, TX, September 2016.
26. Larson D[+], Mercer D, Paffett C[+], Romero J[+], Neher L[+], **Salas C**. Partial Release of the Pronator Quadratus Muscle for Soft Tissue Coverage of a Distal Radius Volar Locking Plate. 91st Annual Meeting of the North Pacific Orthopaedic Society, Coeur D'Alene, ID, September 2016.
27. Ortiz G[+], Menzer H[+], Gill GK[+], Johnson P[+], Schenck R, Treme G, Qeadan F, **Salas C**. Arciero vs. Laprade: A biomechanical comparison of two techniques for knee posterolateral corner reconstruction. 2016 New Mexico Shared Knowledge Conference, Albuquerque, NM, April 2016.
28. Wostbrock N[+], Paffett C[+], Romero J[+], Neher LE[+], Larson D[+], Mercer D, **Salas C**. Pronator quadratus rotational muscle flap for coverage of a distal radius volar plate. 2016 New Mexico Shared Knowledge Conference, Albuquerque, NM, April 2016.
29. **Salas C**, Mercer D, Carlston C[+]. Morphometric, mechanical, and histological characterization of the ligaments of the thumb carpometacarpal joint: Correlation to thumb stability. 68th Annual Meeting of the Association of Bone and Joint Surgeons, Auckland, NZ, April 2016.
30. **Salas C**, Mercer D, Brantley J[+], Carlston C[+], Reda Taha M. Morphometric, mechanical, and histological characterization of the ligaments of the thumb carpometacarpal joint: Correlation to thumb stability. 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 2016.
31. Tufaro R[+], Telis A[+], Larson D[+], Mercer D, **Salas C**. The H-taping method for prophylactic or temporary fixation of partial A2 pulley tears during rock climbing: A biomechanical study. 2016 Annual Meeting of the Orthopaedic Research Society, Orlando, FL March 5–8, 2016. J Orthop Res, 34: S1. Published abstract.
32. Ortiz G[+], Menzer H[+], Gill GK[+], Johnson P[+], Schenck R, Treme G, Qeadan F, **Salas C**. Arciero vs. Laprade: A biomechanical comparison of two techniques for knee posterolateral corner reconstruction. 2016 Annual Meeting of the Orthopaedic Research Society, Orlando, FL March 5–8, 2016. J Orthop Res, 34: S1. Published abstract.
33. **Salas C**, Mercer D, Brantley J[+], Carlston C[+], Reda Taha M. Morphometric, mechanical, and histological characterization of the ligaments of the thumb carpometacarpal joint: Correlation to thumb stability. 2016 Annual Meeting of the Orthopaedic Research Society, Orlando, FL March 5–8, 2016. J Orthop Res, 34: S1. Published abstract.
34. **Salas C**, Mercer D, Carlston C[+], Lopez A, Moneim M. The CMC View: A comparison of 3 radiographic views by Eaton-Glickel classification and correlation to clinical disease severity. International Wrist Investigators Workshop 2015, Seattle, WA, September 2015.

35. Moneim M, **Salas C**, Mercer D. Long term outcome following partial trapeziectomy and capsular interposition for trapeziometacarpal osteoarthritis. International Wrist Investigators Workshop 2015, Seattle, WA, September 2015.
36. Aboubakr S, **Salas C**, Reda Taha MM. Low velocity impact strength of CFRP composites incorporating nanoclay. American Society for Composites 30th Technical Conference. East Lansing, MI, September 2015.
37. Pourkand A+, **Salas C**, Mercer D, Grow D. Objective evaluation of motor skills training effectiveness for orthopaedic residents utilizing a haptic motion tracking drill system. Western Orthopaedic Association 2015 Annual Meeting. Coeur d'Alene, ID, July-August 2015.
38. Moneim M, Mercer D, Morrell N, **Salas C**. Partial trapeziectomy with capsular interposition for thumb CMC arthritis. Western Orthopaedic Association 2015 Annual Meeting. Coeur d'Alene, ID, July-August 2015.
39. **Salas C**, Mercer D, Orbay J, Moneim M. High resolution motion analysis for identification of primary trapeziometacarpal joint stabilizers during grip motion. International Wrist Investigators Workshop 2014, Boston, MA, September 2014.
40. Hoblet A, **Salas C**, Brantley J, Baldwin E, Godfrey J, Mikola E. Pullout strength and stiffness of a non-metallic suture anchoring system for repair of the central slip of the extensor mechanism at the proximal interphalangeal joint. 78th Annual Meeting of the Western Orthopaedic Association, Big Island, HI, August 2014.
41. **Salas C**, Brantley J, Baldwin E+, Mercer D. Damage in the distal radius following treatment for extra-articular AO23-A3.2 fractures using two-column volar plates. 78th Annual Meeting of the Western Orthopaedic Association, Big Island, HI, August 2014.
42. **Salas C**, Mercer D, Moneim M. Cadaveric study investigating metacarpal subsidence in specimens treated with partial trapeziectomy/partial metacarpal base resection versus those treated with total trapeziectomy. 1st International Thumb Osteoarthritis Workshop, Newport, RI, October 2013.
43. **Salas C**, Hoblet A, Brantley J, Godfrey J, Mikola E. Pullout strength and stiffness of a non-metallic suture anchoring system for repair of the central slip of the extensor mechanism at the proximal interphalangeal joint. 68th Annual Meeting of the American Society for Surgery of the Hand, San Francisco, CA, October 2013, E-presentation.
44. Mercer D, **Salas C**, Brantley J, Baldwin E. Patterns of failure in the distal radius following treatment for AO23-A3.2 fractures using two-column volar plates. International Wrist Investigators Workshop 2013, San Francisco, CA, October 2013.
45. **Salas C**, Mercer D, O'Mahoney G, LaBaze D, Moneim M. Biomechanical study investigating partial trapeziectomy with local soft tissue interposition as possible treatment for trapeziometacarpal osteoarthritis. 59th Annual Meeting of the Orthopaedic Research Society, San Antonio, TX January 2013.
46. Mercer D, Morrell N, Cheema T, **Salas C**. Trapezial osteotomy reduces radial subluxation and improves contact pressure distribution across the thumb carpometacarpal joint in lateral pinch, 74th Annual Meeting of the Western Orthopaedic Association, Monterey, CA, August 2010.
47. Mercer D, **Salas C**, Love J, Lansing L, Medoro A, Reda Taha MM, Cheema T. Simulated osteotomy of the trapezium reduces radial subluxation and improves contact pressure distribution across the thumb carpometacarpal joint in lateral pinch, American Society of Mechanical Engineers Summer Bioengineering Conference, Naples, FL, June 2010.

48. **Salas C**, Tai F, Mercer D, DeCoster TA, Reda Taha MM. Probabilistic failure analysis of locking compression plating vs. intramedullary nailing for the treatment of distal femur fractures, 18th Symposium on Computational Methods in Orthopaedic Biomechanics, New Orleans, LA, March 2010.
49. **Salas C**, DeCoster T, Mercer D, Firoozbakhsh K, Reda Taha MM. Examining Damage Accumulation in Osteoporotic Distal Femur Fracture Repair, Society for Experimental Mechanics Meeting, Albuquerque, NM, June 2009.
50. Neidigk S, **Salas C**, Soliman E, Mercer D, Reda Taha MM. Creep and Relaxation of Osteoporotic Bone, Society for Experimental Mechanics Meeting, Albuquerque, NM, June 2009.
51. Afifi A, Medoro A**, Salas C**, Reda Taha MM, Cheema T. Anatomy of Irreducible Metacarpophalangeal Dislocation in a Cadaver Model, American Society for Surgery of the Hand Conference, September 2009.
52. **Salas C**, Reda Taha MM, DeCoster T, Mercer D. Pattern of Failure of LCP's Contrasted with Conventional Treatment of Distal Femur Fracture, 27th Annual University of New Mexico Orthopaedic Alumni Conference, June 2008.

POSTER PRESENTATIONS AT PROFESSIONAL MEETINGS: (53)

+Denotes mentored student

1. Mottishaw L+, Buksa C+, Elghazali N+, Trujillo R+, Lopez S+, Rush M+, **Salas C**. 3D Biofabrication of Polypropylene Fumarate for Bone-Ligament Composite Interfacial Tissue Engineering. 66th Annual Meeting of the Orthopaedic Research Society, Phoenix, AZ, February 8-11, 2020.
2. Mercer D, Vernon L, Hoekzema N, Gray R, Rubio F, Yeager K, Orbay JL, **Salas C**. Flexor Carpi Radialis Tendon Insertion on the Trapezial Ridge: Correlation of Insertion Length to Failure Force. 66th Annual Meeting of the Orthopaedic Research Society, Phoenix, AZ, February 8-11, 2020.
3. Mercer D, Hoekzema N, Gray R, Orbay JL, Rubio F, Vernon L, Imada A, **Salas C**. Relationship of the Radial Head Safe Zone to the Bicipital Tuberosity. 66th Annual Meeting of the Orthopaedic Research Society, Phoenix, AZ, February 8-11, 2020.
4. Mottishaw L+, Rush MN+, Buksa C+, Elghazali N+, Perez M+, Trujillo R+, Lopez S+, **Salas C**. Hybrid additive manufacturing of poly(caprolactone)-modified bone-ligament composite scaffolds for interface tissue engineering. 2019 Materials Research Society Fall Meeting, Boston, MA, December 4, 2019.
5. Majumdar A+, Chavez W+, Valdez J+, Sapradit TJ+, Bankhead C+, **Salas C**, Mercer D, Richter DL. Unicortical versus bicortical button fixation for distal biceps brachii tendon rupture: A cadaveric biomechanical study. 2019 American Society for Surgery of the Hand Annual Meeting, Las Vegas, NV, September 5-7, 2019.
6. Mottishaw L+, Elghazali N+, Buksa C+, Garcia E+, Perez M+, Rush MN+, **Salas C**. Near-field electrospinning and characterization of polycaprolactone (PCL) scaffolds for bone-ligament enthesis tissue engineering. Advances in Tissue Engineering 27th Annual Short Course, Houston, TX, August 14-17, 2019.
7. Perez M+, Pioche-Lee DR+, Elghazali N+, Mottishaw L+, Lopez S+, Trujillo R+, Garcia E+, Buksa C+, Mauser A+, Prieto F+, Mejias-Morales D+, Rush MN+, **Salas C**. Impact of additive material

incorporated within a 3D printed polycaprolactone scaffold for bone regeneration. Advances in Tissue Engineering 27th Annual Short Course, Houston, TX, August 14-17, 2019.

8. Majumdar A+, Chavez W+, Valdez J+, Sapradit TJ+, Bankhead C+, **Salas C**, Mercer D, Richter DL. Unicortical versus bicortical button fixation for distal biceps brachii tendon rupture: A cadaveric biomechanical study. American Orthopaedic Society for Sports Medicine 2019 Annual Meeting, Boston, MA, July 11-14, 2019.
9. **Salas C**, Elghazali N+, Rush M+, Garcia E+, Buksa C+, Perez M+, Trujillo R+, Lopez S+. Mechanical characterization of polycaprolactone (PCL)/polypropylene fumarate (PPF) composite scaffolds for bone-ligament enthesis tissue engineering. University of Colorado Anschutz Orthopaedic Research Symposium, Aurora, CO, May 8, 2019.
10. Elghazali N+, Rush M+, Garcia E+, Buksa C+, Perez M+, Trujillo R+, Lopez S+, **Salas C**. Bio-3D Printing and Near-Field Electrospinning of Bone-Ligament Tissue Engineering Scaffolds. Society for Biomaterials 2019 Annual Meeting & Exposition, Seattle, WA, April 3-6, 2019.
11. **Salas C**, Rush M+, Garcia E+, Buksa C+, Perez M+, Mauser A+, Nery S+, Prieto F+, Mejias-Morales D+. Engineering the Bone-Ligament Interface for Scapholunate Biomaterial Scaffolds. 65th Annual Meeting of the Orthopaedic Research Society, Austin, TX, February 2-5, 2019.
12. Mercer D, Regalado J+, **Salas C**, Vakharia K+, Prieto F+, Mejias-Morales D+. Titanium mesh as a low-profile alternative to tension band wiring for olecranon repairs. 2019 American Association for Hand Surgery Annual Meeting, Palm Desert, CA, January 30-February 2, 2019.
13. Glatz B, Grow D, **Salas C**, Coffee B, Baca JT. Bariatric Lift Prototype. National Association of EMS Physicians Annual Conference 2019, Austin, TX, January 10, 2019.
14. Garcia E+, Rush M+, Buksa C+, Perez M+, Mauser A+, Nery S+, Prieto F+, Mejias-Morales D+, **Salas C**. 3D bioprinting and near-field electrospinning composite scaffolds for the bone-ligament interface. 2018 New Mexico Shared Knowledge Conference, Albuquerque, NM, November 7, 2018.
15. Prieto F+, Buksa C+, Mejias-Morales D+, Mauser A+, Garcia E+, Rush M+, Nery S+, **Salas C**. 3D bioprinting + near-field electrospinning bone-ligament interface scaffolds. 2018 Biomedical Engineering Society Annual Meeting, Atlanta, GA, October 2018.
16. Gomez J+, Pollard T+, Gauger E+, Newhoff D+, Grow D, Orbay JL, Mercer D, **Salas C**. Quantifying radial head instability and limitations in hand rotation after interosseous membrane and annular ligament simulated injury. 2018 European Orthopaedic Research Society Meeting, Galway, Ireland, September 25-28, 2018.
17. Mercer D, **Salas C**, Gomez J+, Newhoff D+, Gauger E+, Pollard T+, Grow D, Orbay JL. Effect of interosseous membrane injury on hand rotation and radial head multiaxial motion during active pronation and supination activities. 2018 American Orthopaedic Association Annual Meeting. Boston, MA, June 2018.
18. Mercer D, **Salas C**, Long L+, Gilligan P+, Johnson B+, Johnson J+, Mejias-Morales D+, Regalado J+. Biomechanical study of human partial extensor tendon lacerations. 2018 American Orthopaedic Association Annual Meeting. Boston, MA, June 2018.
19. Gomez J+, **Salas C**, Newhoff D+, Gauger E+, Pollard T+, Grow D, Mercer D, Orbay JL, Long L+. Quantifying the multi-axial rotational stability of the radial head during active pronation and supination activities. 64th Annual Meeting of the Orthopaedic Research Society. New Orleans, LA, March 2018.

20. Moneim M, Mercer D, **Salas C**, Lese A[+], Thompson N[+]. Long-term outcomes after partial trapeziectomy with capsular interposition arthroplasty for treating osteoarthritis of the thumb basal joint. 2018 American Association for Hand Surgery Annual Meeting, Phoenix, AZ, January 2018.
21. Nery S[+], Buksa C[+], Fritch C[+], **Salas C**. 3D bioprinting & electrospinning hybrid system for functionally-graded scaffolds of the bone-ligament interface. International Mechanical Engineering Conference and Exposition 2017, Tampa, FL, November 2017.
22. Fritch C[+], Nery S[+], Long L[+], Buksa C[+], **Salas C**. 3D bioprinting & electrospinning for bone-ligament tissue engineering. 15th Annual American Medical Association Research Symposium, Honolulu, HI, November 2017.
23. **Salas C**, Long L[+], Gomez J[+], Reda Taha M, Mercer D. Morphometric, mechanical, and histological characterization of the ligaments of the trapeziometacarpal joint. 2017 Biomedical Engineering Society Annual Meeting, Phoenix, AZ, October 2017.
24. Pourkand A, Smith R, Bhakta K, Zamani N, Mercer D, **Salas C**, Grow D. "Smart" surgical instruments: Surgical skill measurement apparatus for resident motor skills training and evaluation. 2017 Biomedical Engineering Society Annual Meeting, Phoenix, AZ, October 2017.
25. **Salas C**, Long L[+], Gilligan P[+], Johnson J[+], Johnson B[+], Mercer D. Partial extensor tendon lacerations in zone V of human cadavers: A biomechanical study. American Society for Surgery of the Hand 72nd Annual Meeting, San Francisco, CA, September 2017.
26. **Salas C**, Gomez J[+], Newhoff D[+], Pollard T[+], Mercer D, Orbay J. Quantification of radial head instability after simulated annular ligament and interosseous membrane injury during pronation/supination activities. American Society for Surgery of the Hand 72nd Annual Meeting, San Francisco, CA, September 2017.
27. Ortiz G[+], Gill K[+], Menzer H[+], Richter D, Johnson P[+], Schenck R, Treme G, Wascher D, **Salas C**. A biomechanical comparison of Arciero and LaPrade techniques for knee posterolateral corner reconstruction. 11th Biennial International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine Congress, Shanghai, China, June 2017.
28. **Salas C**, Tabe CE, Tufaro R[+], Addae-Mensah K[+], Tandberg WD, Buksa C[+], Avila J[+], Wernly J. The surgeon's role in cerclage wire failure after sternal fracture repair: A biomechanical evaluation. 63rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, March 2017.
29. **Salas C**, Nery S[+], Hamilton A[+], Pourkand A[+], Mercer D, Grow D. "Smart" surgical instruments: Pedicle probe for resident motor skills training and evaluation. 63rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, March 2017.
30. **Salas, C**, Gomez J[+], Tufaro R[+], Pourkand A[+], Grow D, Silva S. Bone mineral density sensitivity to axial rotation and region-of-interest selection at the lateral distal femur. 63rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, March 2017.
31. Telis A[+], Tufaro R[+], Larson D[+], Mercer D, **Salas C**. H-taping for fixation of partial A2 pulley tears in rock climbers. Western Orthopaedic Association 2016 Annual Meeting, Indian Wells, CA, September 2016.
32. **Salas C**, Bankhead C[+], Grow D, Mercer D. "Smart" surgical instruments for evaluation and training of surgical skills for orthopaedic residents. UNM 2016 Education Day Symposium, Albuquerque, NM, September 2016.

33. Telis A+, Tufaro R+, Larson D+, Mercer D, Qeadan F, **Salas C**. The H-taping method for prophylactic or temporary fixation of partial A2 pulley tears during rock climbing: A biomechanical study. American Society for Surgery of the Hand 71st Annual Meeting, Austin, TX, September 2016.
34. Tufaro R+, Telis A+, Larson D+, Mercer D, **Salas C**. The H-taping method for prophylactic or temporary fixation of partial A2 pulley tears during rock climbing: A biomechanical study. 2016 Rocky Mountain American Society of Biomechanics, Estes Park, CO, April 2016
35. Gomez J+, Tufaro R+, Pourkand A+, Grow D, **Salas C**. Sensitivity of bone mineral density measurements to axial rotations and scan analysis in dual energy X-ray absorptiometry of the lateral distal femur. 2016 New Mexico Shared Knowledge Conference, Albuquerque, NM, April 2016.
36. Tufaro R+, Telis A+, Larson D+, Mercer D, **Salas C**. The H-taping method for prophylactic or temporary fixation of partial A2 pulley tears during rock climbing: A biomechanical study. 2016 New Mexico Shared Knowledge Conference, Albuquerque, NM, April 2016.
37. Tufaro R+, Telis A+, Larson D+, Mercer D, **Salas C**. The H-taping method for prophylactic or temporary fixation of partial A2 pulley tears during rock climbing: A biomechanical study. 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 2016.
38. Ortiz G+, Menzer H+, Gill GK+, Johnson P+, Schenck R, Treme G, Qeadan F, **Salas C**. Arciero vs. Laprade: A biomechanical comparison of two techniques for knee posterolateral corner reconstruction. 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 2016.
39. Mercer D, **Salas C**, Morrell N, Moneim M. Partial trapeziectomy with capsular interposition arthroplasty as treatment for thumb carpometacarpal osteoarthritis. American Society for Surgery of the Hand 70th Annual Meeting, Seattle, WA, September 2015.
40. **Salas C**, Orbay J, Mercer D. High resolution motion analysis for investigating trapeziometacarpal joint motion in lateral pinch and grip. 2015 American Orthopaedic Association Annual Meeting, Providence, Rhode Island, June 2015.
41. **Salas C**, Mercer D. High resolution motion analysis for identification of primary trapeziometacarpal joint stabilizers during grip motion. 61st Annual Meeting of the Orthopaedic Research Society, Las Vegas, NV, March 2015.
42. Moneim M, Mercer D, Morrell N, **Salas C**. Partial trapeziectomy with capsular interposition arthroplasty for surgical treatment of thumb carpometacarpal osteoarthritis. 6th Combined Meeting of the American Society for Surgery of the Hand and Japanese Society for Surgery of the Hand, Maui, HI, April 2015.
43. Evans S+, Brantley J+, **Salas C**, Baldwin E+, Mercer D. Anatomical study investigating structures at risk during volar percutaneous scaphoid fixation. 78th Annual Meeting of the Western Orthopaedic Association, Big Island, HI, August 2014.
44. **Salas C**, Brantley J+, Clark J+, Baldwin E+, Reda Taha MM, Mercer D. Patterns of failure in the distal radius following treatment for extra-articular fractures (AO 23-A3.2) using two column volar plates. 60th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2014.
45. **Salas C**, Dickens A+, Rise L+, Reda Taha MM, Gehlert R. Titanium mesh as a low-profile alternative for treatment of patella fractures: A feasibility study. 60th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2014

46. **Salas C**, Brantley J[+], Hoblet A[+], Mikola E. Pullout strength and stiffness of a non-metallic suture anchoring system for repair of the central slip of the extensor mechanism of the proximal interphalangeal joint. 60th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2014.
47. Mercer D, Brady C[+], Brantley J[+], Evans S[+], **Salas C**. Volar percutaneous approach for treatment of scaphoid fractures: An anatomical study investigating structures at risk. 68th Annual Meeting of the American Society for Surgery of the Hand, San Francisco, CA, October 2013.
48. Brady C[+], Brantley J[+], **Salas C**, Evans S[+], Mikola E, Mercer D. Volar percutaneous approach for treatment of scaphoid fractures: Anatomical study investigating structures at risk. New Mexico Shared Knowledge Conference 2013, Albuquerque, NM.
49. **Salas C**, DeCoster TA, Reda Taha MM, Hoopes D[+]. Finite element design and experimental testing of a novel triangular external fixation configuration for tibial shaft fracture treatment. Biomedical Engineering Society 2012 Annual Meeting, Atlanta, GA, October 2012.
50. **Salas C**, Dragomir-Daescu D. Finite element models of the proximal femur: Changing CT settings and meshing strategy, 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, February 2012.
51. **Salas C**, Mercer D, Reda Taha MM, Mercer R, DeCoster T. Biomechanical and finite element evaluation of intramedullary nail vs. locking compression plate used in the treatment of osteoporotic distal femur fractures, 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2010.
52. **Salas C**, Marmor M, Chu T, Hansma P, Matityahu A, Buckley J. Assessment of Local Bone Quality of the Distal Radius Using a Novel Hard Tissue Diagnostic Instrument, American Society of Mechanical Engineers Summer Bioengineering Conference, Lake Tahoe, CA, June 2009.
53. Afifi A, Medoro A[+], **Salas C**, Reda Taha MM, Cheema T. Anatomy of Irreducible Metacarpophalangeal Dislocation in a Cadaver Model, American Orthopaedic Association Meeting, San Francisco, CA, October 24-27, 2009.

PATENT APPLICATIONS/INVENTION DISCLOSURES:

AWARDED: (1)

- Rise L, **Salas C**, Dickens A, Taha MR, inventors; STC.UNM, assignee. Low-profile, high tension mesh plate for subcutaneous fracture fixation. US patent 9,517,097. December 13, 2016.

PENDING: (6)

- PCT/US18/42559 PCT Filed July 17, 2018 – "Scaffolds for Bone-Soft Tissue Interface and Methods of Fabricating the Same"
- PCT/US15/836,684 Filed December 8, 2017 - "Pelvic Ring Emergency Stabilizing System (PRESS)"
- Provisional 62/641,179 Filed March 9, 2018 – "Bariatric Lift Assist Device"
- PCT/US filed December 2018, Provisional 62/597,010 Filed December 11, 2017 - Mild Traumatic Brain Injury Diagnostic Immunochromatographic Microneedle Patch
- Provisional 62/591,094 Filed November 27, 2017 – "Modifiable Socket for Transtibial Immediate Post-Operative Prosthesis"
- Provisional 62/777,640 Filed November 2018 – "Wheelchair Accessories for Stroke Patients"

NOTABLE PRESS ON RESEARCH/EDUCATION/INNOVATION (2015-2020):

1. UNM Professor Spearheads Project to 3D Print 5,000 Masks for Immigrants. Daily Lobo. https://www.dailylobo.com/article/2020/09/unm-professor-spearheads-project-to-3d-print-5000-masks-for-immigrants. September 2020.
2. UNM Using 3D Face Mask-Printing Initiative to Help New Mexico Communities. KOAT News. https://www.koat.com/article/unm-using-3d-face-mask-printing-initiative-to-help-new-mexico-communities/33386083#. July 21, 2020.
3. UNM Faculty Pull Together to Takle Coronavirus. KUNM. https://www.kunm.org/post/unm-faculty-pull-together-tackle-coronavirus. April 17, 2020
4. UNM Receives Grant to Create 3D Printing Hub for PPE. KOB4 News. https://www.kob.com/albuquerque-news/unm-receives-grant-from-air-force-to-create-3d-printing-hub-for-ppe/5700694/. April 14, 2020.
5. School of Engineering Leaps Into Making Masks. Albuquerque Journal. https://www.abqjournal.com/1442981/school-of-engineering-leaps-into-making-masks.html. April 12, 2020.
6. National non-profit inspires New Mexico girls to pursue male-dominated career. KRQE Channel 13. https://www.krqe.com/news/national-non-profit-inspires-new-mexico-girls-to-pursue-male-dominated-career/. June 1, 2019, Accessed June 20, 2019.
7. Putting ideas to work: alumna's practical approach is changing the ortho game. Mirage. 2019 spring;39(1):12-14. https://issuu.com/unm-alumni-association/docs/unm-019-a-mirage-spring-2019-issuu/12. Published March 1, 2019, Accessed March 4, 2019.
8. Rivera G. Researchers use new tech to reconstruct ligaments. Daily Lobo. http://www.dailylobo.com/article/2018/10/3d-printing-ligament-research. Published October 3, 2018. Accessed October 8, 2018.
9. Allison Martinez. UNM researchers: 3D printing could change surgery for sports injuries. KRQE Channel 13. https://goo.gl/ZfHspP. Accessed September 27, 2018
10. Good as new: Bioprinting replacements for worn-out ligaments, UNM HSC Newsbeat, September 10, 2018: http://hscnews.unm.edu/news/good-as-new
11. UNM research team wins $50,000 biodesign competition with “Limitless Socket”, UNM HSC Newsbeat, December 18, 2017: http://hscnews.unm.edu/news/unm-research-team-wins-50-000-bio-design-competition-with-limitless-socket
12. Students build devices for patients facing strokes, trauma, other injuries. DailyLobo.com, November 15, 2017: http://www.dailylobo.com/article/2017/11/biodesign-program?_h=d8308510-6f58-40bb-872f-134e83274390
13. UNM students design rehabilitation devices. Albuquerque Journal, October 23, 2017: https://www.abqjournal.com/1081552/health-devices-developed.html
14. Innovation by Design: UNM Health Sciences and engineering course joins forces with Lovelace UNM Rehabilitation Hospital, UNM HSC Newsbeat, October 4, 2017: http://hscnews.unm.edu/news/innovation-by-design
15. UNM Orthopaedics & Rehabilitation Research Division issued patent for innovative meshplate, April 17, 2017: http://news.unm.edu/news/unm-s-orthopaedics-rehabilitation-research-division-issued-patent-for-innovative-meshplate

16. UNM researchers developing bone-ligament adherence systems, using student-built 3D bioprinters, 3Dprint.com, March 2, 2017: https://3dprint.com/166723/unm-grant-bioprinting-bone/
17. UNM researchers build 3D bio-printer, KOB4 Eyewitness News, March 1, 2017: http://www.kob.com/health-news/unm-researchers-build-3d-bio-printer-science-health-technology/4413818/
18. UNM researchers using 3-D printer to create replacement human tissue, KRQE News 13, February 23, 2017: http://krqe.com/2017/02/23/unm-researchers-using-3-d-printer-to-create-replacement-human-tissue/
19. UNM orthopaedics studies use of 3D-printed "tissue for joint replacements, DailyLobo.com, February 28, 2017: http://www.dailylobo.com/article/2017/02/28-3d-tissue-hsc-research
20. UNM Orthopaedics investigating 3D-printed "tissue" for joint replacements, UNM HSC Newsbeat, February 21, 2017: http://hscnews.unm.edu/news/releases-20170221-5800658
21. 3D printing creates low-cost prosthetic hands for children, Orthopedics This Week, September 1, 2016: https://ryortho.com/breaking/3d-printing-creates-low-cost-prosthetic-hands-for-children/
22. UNMH foundation could help fund future of prosthetics, New Mexico Daily Lobo, August 16, 2016: http://www.dailylobo.com/article/2016/08/3d-printing-
23. 5 things you need to know today, and one of the coolest local experiments with 3-D printing, Albuquerque Business First, August 9, 2016: https://www.bizjournals.com/albuquerque/blog/morning-edition/2016/08/unm-3d-printing-prosthetic-hands-pediatric-patient.html
24. 3D printing provides cheap alternative to prosthetic hands, KRQE News 13 Albuquerque, August 8, 2016: http://krqe.com/2016/08/08/3d-printing-provides-cheap-alternative-to-prosthetic-hands/
25. UNM physicians studying 3-D printing of prosthetic hands and fingers, UNM HSC Newsbeat, August 5, 2016: http://hscnews.unm.edu/news/unm-orthopaedics-studying-3-d-printing-of-prosthetic-hands-and-fingers

26. New biodesign course at UNM generates new, award-winning technologies, STC.UNM, February 18, 2016: https://stc.unm.edu/new-biodesign-course-at-unm-generates-new-award-winning-technologies/
27. Biodesign course wins award for invention proposals, DailyLobo.com, February 18, 2016: http://www.dailylobo.com/article/2016/02/18-biodesign-course-wins-award-for-proposals
28. UNM, national initiative encourages women to enter this medical field, Albuquerque Business First, February 11, 2016: http://www.bizjournals.com/albuquerque/blog/morning-edition/2016/02/unm-national-initiative-encourages-women-to-enter.html
29. UNM orthopaedics research team contributes to "Biodesign" class award, UNM HSC Newsbeat, February 9, 2016: http://hscnews.unm.edu/in-brief/unm-orthopaedics-research-team-contributes-to-biodesign-class-award
30. 'Biodesign' course teams UNM engineering students, faculty with UNM physician, UNM HSC Newsbeat, September 14, 2015: http://hscnews.unm.edu/news/biodesign-course091415
31. UNM orthopaedics investigates "smart" surgical tools for residents, UNM HSC Newsbeat, June 1, 2015: http://hscnews.unm.edu/news/unm-orthopaedics-investigates-smart-surgical-tools-for-residents060115
32. Engineering, orthopaedics program focuses on women, Albuquerque Journal, March 16, 2015: http://www.abqjournal.com/555292/engineering-orthopedics-program-focuses-on-women.html
33. Hands-on with The Perry Initiative, UNM HSC-TV, December 9, 2013: https://www.youtube.com/watch?v=UyNPJJ7W_U4&feature=youtu.be

CURRENT GRANT AND CONTRACT FUNDING: $228,814

- Lobo Rainforest I-Corp Site Program Salas (PI) 2/1/2020-5/1/2021
  Funding Agency: STC.UNM/National Science Foundation
  Grant Title: Med-Spec: Medical Checklist and Assistive Platform
  Summary: The technology supported is a checklist application with various assistive virtual tools including interactive user specific physical accessories. The application allows users to access a library of standard checklists for the medical field. Additionally, users can create and customize checklists. Checklists can have added features, including timers, drug dosages, standard ranges for vitals, alerts, etc.
  Funding amount: $3,000

- Innovation/Commercialization award
  Project Title: Med-Spec: Medical Checklist and Assistive Platform
  Principal Investigators: Salas
  Summary: The technology supported is a checklist application with various assistive virtual tools including interactive user specific physical accessories. The application allows users to access a library of standard checklists for the medical field. Additionally, users can create and customize checklists. Checklists can have added features, including timers, drug dosages, standard ranges for vitals, alerts, etc.
  Funding Agency: UNM Clinical and Translational Science Center and UNM School of Engineering
  Funding period: 2/1/2020-1/31/2021
  Funding amount: $50,000

- Equipment Grant Salas (PI) 08/01/2019-07/31/2020
  Funding Agency: UNM Health Sciences Center
  Grant Title: Low Capacity Mechanical Load Frame for Soft-Tissue and 3D Bioprinted Scaffold Characterization
  Summary: This equipment supports tensile and compressive mechanical characterization of low-force capacity cadaveric and synthetic biomaterials (small ligaments, tendon, skin, bioprinted and electrospun tissue scaffolds, etc.).
  Funding Amount: $18,000

- Education grant
  Project Title: Evaluating the Effects of Using 3D Printed Models to Improve Acetabular Fracture Identification and Classification by Orthopaedic Surgical Residents
  Principal Investigator: Salas (PI)
  Summary: The purpose of this study is to use 3D models to improve resident education by creating a visual, tangible reference to understand acetabular fracture classification: To ascertain whether the use of 3D printed models of acetabular fractures enables surgical residents to more correctly classify each fracture type over the use of 2D CT scans only; To understand the long-term impact of fracture classification training.
  Percent Effort: 1%
  Funding Agency: Scholarship in Education Allocations Committee (SEAC)
  Funding period: 9/15/2019-9/14/2021
  Funding amount: $8,850

- UL1TR001449 (Supplement)

Project Title: (Parent) UNM Clinical and Translational Science Center, (Supplement) Advanced Biomanufacturing of the Bone-Ligament Interface
Principal Investigators: Larson (PI), Salas (Supplement PI)
Summary: The overarching goal of this research program is to develop patient-specific bone-ligament-bone scaffolds utilizing a novel 3D bioprinting and electrospinning biomanufacturing technology. This goal will be accomplished by developing a thorough understanding of the interrelationship of the fabrication technique to the scaffold structure and its ability to facilitate health cell-matrix interactions.
Percent Effort: 33%
Funding Agency: National Institutes of Health
Funding period: 9/1/2018-3/31/2020
Funding amount: $148,964 (Supplement)

PAST GRANT AND CONTRACT FUNDING: ($289,500 as PI; $5,000 as Co-PI)

- Innovation/Commercialization award
  Project Title: Wheelchair Accessories for Stroke Patients (WASP)
  Principal Investigators: Salas
  Summary: The technology developed under this award is a customizable, suspension armrest for stroke patients that provides support and comfort over traditional options and opportunity for resistance training for patients with spasticity. This award supports prototyping and testing of the technology.
  Funding Agency: UNM Clinical and Translational Science Center and UNM School of Engineering
  Funding period: 2/1/2019-1/31/2020
  Funding amount: $50,000

- Education grant
  Project Title: "Smart" Surgical Instruments for Evaluation and Training of Surgical Skills for Residents in the University of New Mexico Graduate Medical Education Program
  Principal Investigators: Salas
  Summary: We propose the development of sensor based surgical instruments (surgical drill and spine awl) for use in training and evaluation of the surgical skills of UNM orthopaedic residents. We will implement this evaluation program at the 2015 (Phoenix), 2016 (ABQ), and 2017 (ABQ) Southwest Orthopaedic Trauma Association's PGY1 Surgical Skills Course. The drilling and spine probe skills of year 1 UNM residents will be evaluated and compared to 25 residents from orthopaedic residency programs in the US Southwest region (University of Arizona, William Beaumont, Texas Tech University, Mayo Clinic Scottsdale, University of Las Vegas – Nevada, Banner Health). This information will be used to establish a training program for UNM orthopaedic residents using our "smart" surgical instruments.
  Funding Agency: UNM Scholarship in Education Allocations Committee (SEAC)
  Funding Period: 9/1/2015-6/30/2019
  Funding amount: $19,000

- Lobo Rainforest I-Corp Site Program Salas (PI) 3/1/2019-5/1/2019
  Funding Agency: STC.UNM/National Science Foundation
  Grant Title: Wheelchair Accessories for Stroke Patients (WASP)
  Summary: The technology supported under this award is a customizable, suspension armrest for stroke patients that provides support and comfort over traditional options and opportunity for resistance training for patients with spasticity. This award supports early stage entrepreneurial activities.
  Funding amount: $3,000

- Innovation/Commercialization award Salas (PI) 2/1/2018-1/31/2019
  Funding Agency: UNM Clinical and Translational Science Center and UNM School of Engineering
  Grant Title: Modifiable Socket for Transtibial Immediate Post-Operative Prosthesis (Limitless Socket)
  Summary: This proposal is a result of the Biodesign Initiative, structured to bring together a multidisciplinary team of investigators from UNM Main and HSC campuses to facilitate ideas and innovations with commercial potential to address barriers in clinical care. The technology developed under this award is a transtibial immediate post-operative prosthesis that allows for early mobility and faster transition to a permanent prosthesis.
  Funding amount: $50,000

- Basic science grant Salas (PI) 10/1/2016-9/30/2018
  Funding Agency: American Foundation for Surgery of the Hand
  Grant title: Hybrid 3D Bioprinting/Electrospinning: Application to Hand and Wrist Surgery
  Summary: This research proposal targets delineating the interrelationship between a hybrid material fabrication technique for 3D scaffolds to regenerate the ligament-bone interface at the scapholunate joint.
  Funding amount: $20,000

- Foundation grant Salas (PI) 8/1/2016-7/31/2017
  Funding Agency: Carrie Tingley Hospital Foundation
  Grant Title: Investigating the Use of 3D Partial Finger/Partial Hand Prosthetics for Pediatric Patients at Carrie Tingley Hospital
  Summary: 3D printed devices have shown promise as a low-cost pediatric prosthetic, but no mechanical test data exists to support their use. We requested funding to support a 1-year research program designed to test the feasibility of using 3D printing technology to manufacture partial finger and partial hand prosthetic devices for use at CTH.
  Funding amount: $15,000

- Faculty development award Salas (PI) 9/1/2016-8/31/2017
  Funding Agency: Women in STEM (WIS) Faculty Development Award, University of New Mexico
  Grant Title: Engineering the Bone-Ligament Interface through 3D Bioprinting/Electrospinning
  Summary: This research proposal targets delineating the interrelationship between a hybrid material fabrication technique, the structure of each material phase, and multi-scale mechanical properties of a novel biocomposite to serve as a 3D scaffold for regeneration of the ligament-bone interface.
  Funding amount: $10,000

- Innovation/Commercialization award Salas (PI) 4/1/2016-3/31/2017
  Funding Agency: UNM Clinical and Translational Science Center and UNM School of Engineering
  Grant Title: Pelvic Ring Emergency Stabilizer System (PRESS)
  Summary: This proposal is a result of the Biodesign Initiative, structured to bring together a multidisciplinary team of investigators from UNM Main and HSC campuses to facilitate ideas and innovations with commercial potential to address barriers in clinical care. The problem in which we were tasked with providing a solution was for a pelvic binding system for traumatic pelvic ring fractures that enabled full frontal access without the need for removal of the device.

Funding amount: $25,000

- NM Small Business Assistance grant Salas (PI) 6/1/2016-9/30/2016
  Funding Agency: Sandia National Laboratories
  Grant Title: "Hey Dad" Fall Prevention Device
  Summary: This was a collaborative project with a local small business, Kennedy Trimnell Co. The objective was to develop a device that was intended to be worn by individuals who had lost function of their legs and had been impacted by dementia. Functionally, the device needed to trigger an audible warning to the wearer in the event that they attempted to rise from their seat.
  Funding amount: $7,500

- Innovation/Commercialization award Salas (PI) 9/1/2015-8/31/2016
  Funding Agency: UNM Clinical and Translational Science Center
  Grant Title: Low Cost Spine Surgical Simulator for Orthopaedic Residency Training with Advanced Haptic Technology
  Summary: Orthopaedic training is a motor skills-demanding surgical specialty. Historically, much of the technical learning occurs in the operating room (OR). This is an effective method of training for simple fractures or low-risk cases. For more complicated operations or high-risk situations such as spine surgery, using the OR as an introduction to surgical techniques can introduce unnecessary risk. We proposed development of an augmented reality spine surgical simulator for evaluation and training of orthopaedic residents.
  Funding amount: $25,000

- Industry grant Salas (PI) 6/1/2015-5/30/2016
  Funding Agency: Arthrex Research Grant
  Grant Title: Regaining Knee Stability Following Posterolateral Corner Knee Reconstruction Using Arciero and LaPrade Techniques
  Summary: The purpose of this study is to investigate which reconstruction technique best restores stability to an isolated PLC injury and with concurrent injuries at the tibiofibular joint and ACL, respectively.
  Funding amount: $15,000

- Research award Tabe (PI) 12/1/2014-11/30/2015
  Funding Agency: Surgical Research Investigator Award, UNM Dept. of Surgery
  Grant Title: The Surgeon's Unintentional Role in Sternal Wire Failure
  Summary: The objective of this study was to evaluate the surgeon's role in contributing to sternal wire failure by measuring axial forces applied to sternal wires placed by a cardiothoracic surgeon. This evaluation was made for wires placed using Figure-of-Eight (Fo8) and Simple closure techniques. We found that a significant number of observed forces exceed the yield strength of the wire during closure (Fo8: 126/178; Simple: 73/160). Mechanically, any stresses exceeding the yield strength of the material is causing un-recoverable deformation. The surgeon is contributing to failure of sternal wires.
  Role: Co-PI; responsible for design and implementation of experiments, manuscript first author
  Funding amount: $5,000

- Innovation/Commercialization Award Salas (PI) 10/1/2014-9/30/2015
  Funding Agency: UNM Clinical and Translational Science Center and UNM School of Engineering
  Grant Title: Innovative Tools and Techniques for Pediatric Bone Density Positioning

Summary: The pilot funding requested will provide the opportunity to investigate the feasibility of an innovative tool and technique for positioning and support of pediatric cerebral palsy (CP) patients (and all pediatric patients requiring annual BMD scans) in bone density scanners to eliminate errors in diagnosis and treatment.
Funding amount: $50,000

PENDING GRANT AND CONTRACT FUNDING: ($500,300 as PI; $3,616,404 as Co-PI)

- NSF Faculty Early Career Development Program (CAREER 17-537)
  Salas (PI) 05/01/2020-04/30/2025
  Funding Agency: National Science Foundation
  Grant Title: CAREER: Advanced Biomanufacturing of Functionally-Graded Bone-Ligament-Bone Scaffold
  Summary: The goal of this research project is to develop a complex 3D bone-ligament-bone (BLB) scaffold that effectively mimics endogenous tissue to guide functional tissue regeneration. Essential to a successful outcome, the BLB scaffold must: 1) recapitulate the functionally-graded, mechanically-competent bone ligament interface at time zero and 2) direct, through strategic biochemical, biomechanical, and structural optimization, the differentiation of mesenchymal stem cells (MSCs) to the desired terminal cell types and encourage expression of extracellular matrix proteins essential for the regeneration of bone, ligament, and interfacial phase-specific tissues. To facilitate this outcome, scaffolds will be fabricated using a hybrid process of direct-write 3D printing (3DP) and near-field electrospinning (NFE) using a custom platform with an integrated control system to allow for multi-phase, multi-material deposition in a single process. Leveraging the knowledge gained from preliminary testing, new bioinks will be developed for each tissue phase, relationships between material properties and 3DP/NFE fabrication parameters will be characterized, and the mechanical strength, stiffness, and cell viability of the scaffolds will be quantified. Optimized scaffolds, seeded with a co-culture of terminally-differentiated human fibroblasts, osteoblasts, and chondrocytes in a static and mechanically stimulated environment, will be assessed for phenotypic marker expression and extracellular matrix distribution. Lastly, scaffolds will be assessed for their ability
  to direct the differentiation of MSCs to the relevant terminal cell types for each phase.
  Funding Amount: $500,300

- Graduate Research Training Initiative for Student Enhancement (G-RISE) (T32)
  Canavan (PI), Salas (Co-PI) 05/01/2020-04/30/2025
  Funding Agency: National Institutes of Health
  Grant Title: Mentoring with Impact for Job Opportunity Alternatives in STEM (MIJO/AS)
  Summary: Biomedical career/research/mentoring training opportunities for graduate students in STEM
  Funding Amount: $3,616,404

TEACHING/EDUCATION

POSTDOCTORAL RESEARCH ASSISTANTS (1):

- Matthew Rush PhD, Fall 2018 - present

PhD STUDENT MENTORING/THESIS ADVISOR (4):

- Natalia McIver, Biomedical Engineering (PhD anticipated 2023)
- Hannah Russert, Biomedical Engineering (PhD anticipated 2023)
- John Yarmey, Biomedical Engineering (MS anticipated Dec. 2019)
- Phuong Nguyen, Biomedical Engineering (project advisor, PhD 2019)

MASTER'S STUDENT MENTORING/THESIS ADVISOR (7):

- Lorraine Mottishaw, Biomedical Engineering (MS anticipated 2020)
    - Thesis: TBD
- Christopher Buksa, Mechanical Engineering (MS anticipated 2020)
    - Thesis: "Voxel-Based Control of the Internal Structure of 3D Bioprinted Scaffolds – Materials and Architecture"
- Jodie Gomez, Mechanical Engineering (MS anticipated 2020)
    - Thesis: "Pediatric Bone Density Positioning Device for Lateral Distal Femur Scans: Design, Fabrication, and Validation"
- Jasmin Regalado, Mechanical Engineering, MS degree with distinction, Summer 2018; current position: Research Engineer at Intel Corporation
    - Thesis: "Mechanical Characterization of Low-Profile, High-Tension Mesh Plates for Subcutaneous Bone Fixation"
- Rachel Tufaro, Biomedical Engineering, MS degree with distinction, Summer 2016; current position: Research Scientist, Mechanical Engineer at Sandia National Laboratories
    - Thesis: "The H-Taping Method for Prophylactic and Temporary Treatment of A2 Pulley Tears"
- Gabriel Ortiz, Mechanical Engineering, MS degree, Fall 2016; current position: Research Technician, Mechanical Engineer at Los Alamos National Laboratories
    - Thesis: "Arciero vs. LaPrade: A Biomechanical Comparison of Two Techniques for Knee Posterolateral Corner Reconstruction"
- Justin Brantley, Biomedical Engineering, MS degree with distinction Summer 2014; current position: PhD student in Electrical Engineering at the University of Houston, TX
    - Thesis: "A Biomechanical Analysis of One-Third Tubular Plates for the Treatment of Benign Lesions in the Distal Femur"

UNDERGRADUATE STUDENT MENTORING (17):

1. Joshua Trujillo, Post-Baccalaureate research assistant, 2019
2. Durante Pinoche, Chemical & Biological Engineering (BS anticipated Spring 2021)
3. Ruben Trujillo, Chemical & Biological Engineering (BS Spring 2019); accepted to Cornell University
4. Serafina Lopez, Chemical & Biological Engineering (BS Spring 2019); accepted to Cornell University
5. Marissa Perez, Chemical & Biological Engineering (BS Spring 2019); accepted to Rice University; **NSF Graduate Research Fellowship awardee**
6. Nafisa Elghazali, Post-Baccalaureate, 2019, currently: PhD student at UC Irvine
7. Darielys Mejias-Morales, Post-Baccalaureate, 2018, currently: Medical school in Puerto Rico
8. Jacob Valdez, Mechanical Engineering (BS Spring 2019)
9. Tony Sapradit, Mechanical Engineering (BS anticipated 2021)
10. Daniel Sikora, Biochemistry, cum laude, Fall 2018, currently: PhD student in Biomedical Engineering at UNM
11. Ava Mauser, Chemical and Biological Engineering, summa cum laude, Spring 2018, currently: PhD student in Biomedical Engineering at the University of Michigan; **NSF Graduate Research Fellowship awardee**
12. Steven Nery, Electrical Engineering, magna cum laude, Spring 2017, currently: Quality Engineer, Sennheiser
13. Alexander Hamilton, Computer Engineering, summa cum laude, Spring 2017, currently: DevOps Engineer, OpenEye Scientific Software Inc.
14. Christopher Buksa, Mechanical Engineering, Spring 2017, currently: graduate research assistant

15. Terese Martinez, Mechanical Engineering, summa cum laude, Spring 2017, currently: PhD program Mechanical Engineering Georgia Tech
16. Jessica Avila, Mechanical Engineering, BS summa cum laude, Spring 2016; currently: Medical student, Texas Tech University El Paso
17. Lauren Long, Mechanical Engineering, BS magna cum laude, Spring 2016; currently: MS Mechanical Engineering, University of Michigan

UNM MEDICAL STUDENT MENTORING (11):

All students listed were mentored through their medical school required research projects

1. Benjamin Spangler, 1st year medical student, Project: 3D bioprinting and electrospinning – optimization of the hybrid platform for composite tissue scaffolds
2. John Garcia, 2nd year medical student at Meharry Medical College, Project: Medial collateral ligament reconstruction Treme vs. LaPrade
3. Ryen Ormesher, 2nd year medical student, Project: "Smart" Pedicle Probe for orthopaedic resident training and education
4. Fermin Prieto, 3rd year medical student, Project: 3D bioprinting and electrospinning – Polyethylene Glycol Diacrylate bioinks
5. Chanju Fritch, 4th year medical student, Project: 3D bioprinting and electrospinning – tissue decellularization for bioinks
6. Tom Pollard, Project: Multiaxial radial head stability following injury to the annular ligament and interosseous membrane; now a resident in orthopaedics at George Washington University
7. Joshua Romero, Project: Pronator quadratus release for distal radius coverage to prevent flexor tendon injury
8. Aditi Majumdar, Project: Percutaneous pinning of distal tibial fractures in children; now a resident in orthopaedics at UNM
9. Dukens LaBaze, Project: Thumb metacarpal subsidence after partial trapeziectomy with capsular interposition
10. Kwasi Addae-Mensah, Project: Surgeons role in sternal wire failure
11. Christina Brady, Project: Benign osseous tumors of the distal femur

UNM ORTHOPAEDIC RESIDENT MENTORING (20):

All residents were mentored through their required residency research projects while at UNM

1. Aamir Ahmad, Project: "Smart" Pedicle Probe
2. Christopher Kurnik, Project: "Smart" Pedicle Probe
3. Christopher Schultz, Project: Digital caliper study for rotational osteotomy
4. Patrick Gilligan, Project: Extensor tendon lacerations in zone 5
5. Erika Garbrecht, Project: Chondrocyte viability after exposure to antiseptic solutions and TXA
6. Aditi Majumdar, Project: Pediatric Pinning of distal femur fractures
7. Paul Johnson, Project: Arciero/LaPrade reconstructions for PLC injury
8. Christopher Bankhead, Project: Distal biceps button fixation: unicortical or bicortical fixation
9. Alexander Telis, Project: H-taping method for prophylactic treatment of A2 pulley injury in rock climbers
10. Brielle Payne, Project: Flexible intramedullary nails for pediatric femur fractures
11. Michael Decker, Project: Chondrocyte viability after exposure to antiseptic solutions and TXA
12. Drew Newhoff, Project: Multiaxial stability of the radial head following IOM and annular ligament injury
13. Katherine Gavin, Project: Early results from the surgical trauma room
14. George K. Gill, Project: Arciero/LaPrade reconstructions for PLC injury
15. Heather Menzer, Project: Arciero/LaPrade reconstructions for PLC injury, Sports medicine fellow at University of Virginia

16. Evan Baldwin, Project: Trapeziometacarpal thumb stability, Director, Recovery Services of New Mexico
17. Scott Evans, Project: Structure at risk during volar percutaneous scaphoid fixation, Fellowship trained hand surgeon
18. Taylor Jobe, Project: Pediatric pinning of the femur, Fellowship trained hand surgeon
19. Aaron Dickens, Project: Low-profile mesh plate for subcutaneous fracture fixation, Fellowship trained trauma surgeon
20. Daniel Hoopes, Project: Multiaxial triangular external fixation of tibia shaft fractures, Fellowship trained trauma surgeon

ORTHOPAEDIC FELLOW MENTORING (12):

All fellows were mentored through their required fellowship research projects while at UNM

1. Geneva Tranchida, hand surgeon, UNM, NM
2. Scott Sandilands, trauma surgeon, UNM, NM
3. Brandee Black, sports medicine surgeon, UNM, NM
4. Norfleet Thompson, hand surgeon, Campbell Clinic Orthopaedics, TN
5. Erica Gauger, hand surgeon, TRIA Orthopaedic Center, MN
6. James Rose, hand surgeon, Western Orthopaedics & Sports Medicine, CO
7. Cory Carlson, hand surgeon, Aspire Orthopedic Institute, OR
8. Dustin Larson, hand surgeon, The Center Orthopedic & Neurosurgical Care & Research, OR
9. David Erik Peterson, hand surgeon, Cache Valley Hospital, UT
10. Andrea Lese, hand surgeon, West Virginia University, WV
11. Aaron Hoblet, hand surgeon, Desert Orthopaedics, OR
12. Lee Rise, trauma surgeon, Christus St. Vincent Hospital, NM

DISSERTATION/THESIS ADVISORY COMMITTEES (5):

1. Phuong Nguyen, PhD Biomedical Engineering, UNM, Summer 2019
2. Jakub Mroczkowski, MS Mechanical Engineering, New Mexico Institute of Mining and Technology, Spring 2018
3. Jesus Lerma, PhD Mechanical Engineering UNM, Fall 2017
    a. Dissertation: "Engineering Principles Applied to Medical Problems: A Compilation of Projects in Biomechanics"
4. Julia Walker, MS Mechanical Engineering UNM, Summer 2016
    a. Thesis: "The Minimal Model of Type 2 Diabetes: Modeling in Simulink and System Parameter Identification"
5. Ashkan Pourkand, MS Mechanical Engineering, New Mexico Institute of Mining and Technology, Summer 2016
    a. Thesis: "Robotic Tools for Improving the Quality of Bone Drilling"

PHD QUALIFYING EXAM COMMITTEES (4):

1. Ian Larson, PhD Biomedical Engineering (August 2019)
2. Telmo Diez Perez, PhD Biomedical Engineering (Committee Chair, February 2019)
3. Kevin Fotso Tagne, PhD Biomedical Engineering (Committee Chair, February 2018)
4. Adeline Marianne Fanni, PhD Biomedical Engineering (Committee Chair, August 2016)

HIGH SCHOOL STUDENT MENTORING (4):

All students were mentored through their junior/senior honors projects

1. Mystique Lamb, Amy Biel High School Summer 2018- Spring 2019; accepted to Mechanical Engineering at the University of New Mexico
2. Jared Knigge, Hope Christian Academy; currently an undergraduate student in Biomedical Engineering at Colorado State University

3. William Morland, NexGen Academy NM, HS Senior
4. Nicole Spence, Albuquerque Academy graduate 2016, currently: undergraduate student in Biomedical Engineering at Northwestern University

CLASSROOM/LABORATORY TEACHING: (1 undergraduate course, 6 graduate courses, 14 independent study/problems courses)

Fall 2019

1. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)
2. BME 598/CBE 499/CBE 515/ECE 595/ME 561 Biodesign - Graduate level engineering and medicine course to provide students direct experience in the process of innovating medical technologies (~48 lecture hours/semester) – Topic: Pre-hospital and Emergency Medical Services
3. ME 599 Masters Thesis – Graduate research assistant supervision (~10 hours/wk)

Spring 2019

1. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)
2. BME 551 Graduate Problems Course - Graduate student research project on technology development (Wheelchair Accessories for Stroke Patients) (~6 hrs/wk)
3. ME 552 Graduate Problems Course – Graduate problems class in technology development (Wheelchair Accessories for Stroke Patients) (~2 hrs/wk)
4. ME 599 Masters Thesis – Graduate research assistant supervision (~10 hours/wk)

Fall 2018

1. BME 598/CBE 499/CBE 515/ECE 595/ME 561 Biodesign - Graduate level engineering and medicine course to provide students direct experience in the process of innovating medical technologies (~48 lecture hours/semester) – Topic: Geriatrics
2. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)
3. ME 451 Undergraduate Problems Course – Undergraduate problems course in biomechanical research (~4 hrs/wk)
4. ME 599 Masters Thesis – Graduate research assistant supervision (~10 hours/wk)
5. NSMS 650 Research Course - Graduate student research project on technology development (~2 hrs/wk)

Spring 2018

1. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)
2. ME 452 Undergraduate Problems Course – Undergraduate problems course in technology development (Limitless Socket Project) (~4 hrs/wk)
3. ME 552 Graduate Problems Course – Graduate problems class in technology development (Limitless Socket Project) (~4 hrs/wk)
4. ME 599 Masters Thesis – Graduate research assistant supervision (~10 hours/wk)
5. NSMS 650 Research Course - Graduate student research project on technology development (~2 hrs/wk)

Fall 2017

1. BME 598 Biodesign - Graduate level engineering (BME 598) and medicine (BIOM 505) course to provide students direct experience in the process of innovating medical technologies (~48 lecture hours/semester)
2. ME 599 Masters Thesis – Graduate research assistant supervision (~10 hours/wk)
3. NSMS 650 Research – Graduate student research project on technology development (~2 hrs/wk)
4. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)

Spring 2017

1. CBE 551 Graduate Problems Course – Graduate level course in technology development (banana lift system) (~4 hrs/wk)
2. ME 452 Undergraduate Problems Course – Undergraduate problems course in technology development (PRESS System) (~4 hrs/wk)
3. ME 552 Graduate Problems Course - Graduate problems class in medical image segmentation and 3D computer modeling (~3 hrs/wk)
4. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)

Fall 2016

1. BME 598 Biodesign - Graduate level engineering (BME 598) and medicine (BIOM 505) course to provide students direct experience in the process of innovating medical technologies (~48 lecture hours/semester)
2. ME452 Independent Study - Undergraduate Mechanical Engineering course in Biomechanics and Mechanical Design (~48 contact hours/semester)
3. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)

Spring 2016

1. ME551 Independent Study – Graduate Mechanical Engineering course on Matlab and Python Computing Languages (~48 contact hours/semester)
2. ME598 Master's Thesis – Mechanical Engineering MS Thesis advisement course (~100 contact hours/semester)
3. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)

Fall 2015

1. BME598/BIOM505 Biodesign – Graduate level engineering (BME 598) and medicine (BIOM 505) course to provide students direct experience in the process of innovating medical technologies (~48 lecture hours/semester)
2. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)

Summer 2015

1. ME551 Independent Study – Graduate Mechanical Engineering course on LabView and National Instruments Data Acquisition Hardware (~48 contact hours/semester)
2. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)

Spring 2015

1. ME452 Independent Study – Undergraduate Mechanical Engineering course in Biomechanics and Mechanical Design (~48 contact hours/semester)
2. BME572 Biomaterials Engineering (Guest Lecturer) – MS and PhD level course (3 lecture hours)
3. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)

Fall 2014

1. CE202 Engineering Statics – Undergraduate Mechanical/Civil Engineering
2. Orthopaedic Resident Research Co-Instructor (grad medical education) (~6 lecture hours/semester)

SERVICE

LOCAL/REGIONAL/NATIONAL/INTERNATIONAL OUTREACH AND MENTORING ACTIVITIES

Most outreach activities that I have led can be found on our department website at: https://orthopaedics.unm.edu/about-us/outreach.html

- Perry Initiative High School Outreach Program (POP) at the University of New Mexico, Albuquerque (June 2019, March 2018, March 2017, March 2016, March 2015, November 2013, March 2013) - Promoting the advancement of women in orthopaedic surgery and engineering by providing hands on experience (8 hour workshops) in surgical techniques, biomechanical experiments, mentoring/networking. 40 participants annually (nearly 300 NM high school students) UNM program director and mentor; Co-Chair Advisory Board for the national organization
- UNM/APS Black Student Union Health Careers Expo (November 2017, 2018) - Hour long hands-on activity for 30 (per year) high school juniors/seniors to learn about engineering-in-medicine and orthopaedic surgery
- SciGirls of New Mexico (recurring) - Classroom presentations and 3D printed prosthetic hand assembly workshop for junior high students
- Dream Makers Health Careers Program (recurring ~ 2 times/month in summer) - Lead tours of my laboratory and presentations on engineering-in-medicine
- North/North Central Math, Engineering, and Science Achievement (MESA) programs Leadership Summit at NM Highlands University (November 2016) - Led activity for 150 students to assemble 3D printed prosthetic hands
- Perry Initiative Medical Student Outreach Program (MSOP) at the University of New Mexico, Albuquerque, NM (October 2016, 2017, 2018) - Promoting the advancement of female medical students in orthopaedic surgery by providing (4 hour workshops) hands on experience in surgical techniques and mentoring/networking. UNM program director and mentor
- Innovation Academy for Women of the Americas at the University of New Mexico, Albuquerque, NM (Summer 2016, Winter 2019) - An international outreach program that will facilitate the academic and career advancement of women, particularly from underrepresented, minority, and indigenous groups in the fields of Science, Technology, Engineering, Mathematics, and Architecture (STEM+A) by providing them with the knowledge, skills, and support to ascend to higher level research and senior leadership roles in the workforce. Mentored/advised 2 female undergraduate engineering students from Mexico through their summer research projects. Both students won

$10,000 scholarships to attend UNM for graduate school based on their outstanding research projects.

- Exploring Interests in Technology and Engineering (E.X.I.T.E.) Camp Hosted by IBM (August 9th-13th, 2010)- Rochester, MN area middle school girls are teamed up with mentors/volunteers to help them learn about careers in math, science and engineering. Co-organized Mayo Clinic presentation highlighting current research projects in biomedical engineering
- Perry Outreach Program at the University of California, San Francisco (July – August 2009) - Program coordinator and mentor for the inaugural year
- Upward Bound Math and Science Program at California State University, Chico (August 2004-May 2005) - An academic program which assists a diverse population of motivated low income and first generation high school students to achieve their goals of succeeding in post-secondary education. Program tutor for high school math/science
- San Antonio Pre-Freshman Engineering Program (PREP), San Antonio, TX (Summers 2000-2002) - A collaborative effort of local school districts, colleges and universities to encourage underrepresented junior high school and high school students to begin preparing for scientific and engineering career paths. Program mentor, physics instructor, curriculum editor

OTHER SERVICE:

DEPARTMENTAL:

- University of New Mexico Orthopaedic Research Journal – Co-editor – 2014-present

UNM HEALTH SCIENCES CENTER:

- UNM Scholarship in Education Allocations Committee (Spring 2019 – present)
- HSC/STC.UNM Health Hackathon Coordination team (Fall 2017-present)
- UNM School of Medicine/School of Engineering Leadership Team (Spring 2017 – present)
- Advancing Institutional Mentorship Excellence (AIME) Faculty of Color Mentorship Pilot Project participant/mentee (2014-2016)
- Physical Therapy faculty hiring committee seeking assistant professor hire to lead the Gait Analysis Laboratory – Summer/Fall 2015

UNM SCHOOL OF ENGINEERING:

- Biomedical Engineering Graduate Program, Curriculum Committee, October 2019-present
- Special Assistant to the Dean of Engineering for Health Science Relations, 5/2018-present
- Civil Engineering faculty hiring committee seeking 3 assistant professor hires in structural, environmental, and transportation – Fall 2019/Spring 2020
- NIH MARC scholars program faculty mentor for Durante Pioche-Lee – 1/2019-present
- NIH Post-Baccalaureate Research and Education Program faculty mentor for Nafisa Elghazali – 7/2018-present
- McNair Scholars faculty mentor for Marissa Perez – 3/2018-5/2019
- Mechanical Engineering faculty hiring committee seeking assistant professor hire in advanced manufacturing – Fall 2016/Spring 2017
- Student representative on faculty hiring committee seeking assistant professor hire in biomedical engineering and computational modeling, Spring 2013

- Student representative on faculty hiring committee seeking assistant professor hire for advanced materials and cyber security research, Spring 2012