

Curriculum Vitae

Alan R. Hargens, Ph.D.

Present Position, Phone and Fax Numbers, Email Address and Websites:

Professor, Department of Orthopaedic Surgery
University of California, San Diego
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San Diego, CA 92103-8894
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Web Site: <http://bones.ucsd.edu>

Born:

Great Falls, Montana

Citizenship:

U.S.A.

Education:

1962-1966 B.A. in Chemistry, Summa Cum Laude, University of Minnesota, Minneapolis
1966-1971 Ph.D. in Marine Biology, Scripps Institution of Oceanography, University of California,
San Diego

Postgraduate Training:

1971-1972 National Science Foundation NATO Postdoctoral Fellow, Institute of Biological
Chemistry A, University of Copenhagen, Denmark
1973-1975 American Heart Association Advanced Research Fellow, Department of Bioengineering,
School of Medicine, UC, San Diego
1975-1976 National Institutes of Health Trainee, Department of Medicine - Nephrology, University
of California, San Diego

Positions Held:

1971	Postgraduate Research Physiologist, Physiological Research Laboratory, Scripps Institution of Oceanography, University of California, San Diego
1972	Assistant Professor, Department of Zoophysiology, University of Aarhus, Denmark
1975-1976	Assistant Research Bioengineer, Department of AMES (Applied Mechanics and Engineering Sciences) - Bioengineering, School of Medicine, University of California, San Diego
1976-1978	Assistant Research Physiologist, Department of Surgery, School of Medicine, University of California, San Diego
1978-1979	Associate Research Physiologist, Department of Surgery, School of Medicine, University of California, San Diego
1979-1984	Associate Professor of Surgery, Department of Surgery, School of Medicine, University of California, San Diego
1978-1987	Orthopaedic Investigator and Biomedical Engineer, Department of Surgery - V.A. Medical Center, San Diego
1984-1988	Professor of Surgery, Department of Surgery, School of Medicine, University of California, San Diego
1987-1988	Chief, Space Physiology Branch, NASA Ames Research Center, Moffett Field, California
1988-1992	Lecturer, Department of Aeronautics & Astronautics, Stanford University
1988-1997	Space Station Project Scientist, NASA Ames Research Center, Moffett Field, California
1988-1998	Adjunct Professor, Department of Orthopaedics, School of Medicine, University of California, San Diego
1993-2000	Consulting Professor, Program in Human Biology, Stanford University
1994-1996	Chief (Acting), Gravitational Research Branch, NASA Ames Research Center, Moffett Field, California
1996-2000	Senior Research Physiologist, Gravitational Research Branch, NASA Ames Research Center, Moffett Field, California
1998-present	Professor, Department of Orthopaedic Surgery, School of Medicine, University of California, San Diego

Academic and Professional Honors:

1963	NSF Summer Research Award in Chemistry
1965	Phi Beta Kappa
1966	Summa Cum Laude graduate in Chemistry and Mathematics
1966-1969	National Science Foundation Graduate Fellowship
1967	California State Scholarship
1971-1972	National Science Foundation NATO Postdoctoral Fellowship
1973	American Heart Association Research Fellowship
1974-1975	American Heart Association Advanced Research Fellowship
1979-1984	National Institutes of Health Research Career Development Award
1986	Shinshu University Medal, Matsumoto, Japan
1987	Elizabeth Winston Lanier Award, American Academy of Orthopaedic Surgeons and Orthopaedic Research Society (Highest Research Award in Orthopaedic Surgery)
1987	Outstanding Service Award, Veterans Administration
1988	Fellow, American College of Sports Medicine
1988	Phi Beta Delta Honor Society for International Scholars (Charter Member of San Diego Chapter)
1988	NASA Cosmos Biosatellite Group Achievement Award

1989	Associate Fellow, Aerospace Medical Association
1991	Honorary Lecture, University of Alabama College of Medicine, Student Summer Research Program
1992	Sustained Superior Performance Award, NASA Ames Research Center
1992	NASA Ames Honor Award for Excellence in the Category of Mentor
1993	Outstanding Performance Award, NASA
1994	Outstanding Performance Award, NASA
1995	Fellow, Aerospace Medical Association
1995	Outstanding Performance Award, NASA
1995	NASA Ames Women's Mentor Award
2001-2003	Program Chair, International Society of Adaptive Medicine
2003-2006	President, International Society of Adaptive Medicine
2003-2009	Member, NASA/ESA/CNES Review Committee on Development of Countermeasures for Long Duration Space Flight
2003	Jacquelin Perry Award co-author for lower body positive pressure exercise research in knee surgery patients, Orthopaedic Rehabilitation Association
2006	Hallman Lecture Award for Distinguished Visiting Professor, University of Waterloo, Canada
2008	Adaptation Biology and Medicine book dedication to AR Hargens
2008	Recognition Award, American Physiology Society History Group
2008, 2009	Invited Speaker, International Congress of Cardiovascular Sciences, Brazil
2008-2010	Member, American Heart Association Peer-Review Committee for Research
2008	Invited Speaker and Discussant, International Workshop on Cardiovascular Adaptation to Space Flight
2009	Invited Landmark Lecture, International Society of Adaptive Medicine, National Yang-Ming University, Taipei, Taiwan
2009-2011	Member and Acting Chair, "Integrative and Translational Research for the Human System" panel on a National Academies study that will recommend a portfolio and timeline for NASA research in life and physical sciences for the 2010-2020 decade.
2010-2012	Vice Chair, Translational Physiology Interest Group, American Physiological Society
2010	"Most-read full-text journal article by Orthopaedists in 2010": Neuschwander TB, Cutrone J, Macias BR, Cutrone S, Murthy G, Chambers H, and Hargens AR. The effect of backpacks on the lumbar spine in children: a standing magnetic resonance imaging study, Spine 35: 83-88, 2010.
2012	Honorary Lecture, Leslie Oliver Oration "The Gravity of Space Exercise for Astronaut Health and Earth Benefit", presented at Queen's Hospital, London, UK on 23 January 2012.
2013-2016	Chair, Translational Physiology Interest Group, American Physiological Society
2014	Nello Pace Award for Outstanding Leadership in and Contributions to the Field of Gravitational Physiology, presented at the International Society of Gravitational Physiology meeting, Waterloo, Canada on 18 June 2014.
2015	Citation Award from American College of Sports Medicine

Recent Abstracts and Student Awards:

1. **Groppo E**, R Eastlack, A Cutuk, H Noh, A Langemack, E Quigley, G Steinbach, A Hargens and R Pedowitz. Rehabilitation Using Lower Body Positive Pressure After Knee Surgery To Decrease Load

And Preserve Gait Mechanics. Presented at the Southwestern American College of Sports Medicine Conference, San Diego, California, 2000. **(1st Place Student Award)**

2. **White KK**, RS Meyer, JM Smith, SJ Mubarak and AR Hargens. Intramuscular and blood pressures in legs positioned in the hemilithotomy position on a fracture table. San Diego Chapter of the American College of Surgeons and San Diego Society of General Surgeons, Surgical Residents Paper Competition, 2000. **(2nd Place Award)**
3. **Tanaka K**, J Waldie, G Steinbach, P Webb, D Tourbier, J Knudsen, C Jarvis and A Hargens. Positive and negative counterpressure differentials decrease and increase skin microvascular flow in the hand. AsMA 2001 Meeting. In: Aviation, Space, and Environmental Medicine, 72(3):263, Reno, Nevada, 2001. **(New Investigator Honorable Mention Award)**
4. **Steinbach G**, B Macias, T. Nguyen, D O'Leary, W Yost, J Cantrell and A Hargens. A noninvasive ultrasound technique used to assess changes in cranium dynamics following 30 days bedrest. AsMA 2001 Meeting. In: Aviation, Space, and Environmental Medicine, 72(3):251-252, Reno, Nevada, 2001. **(New Investigator Honorable Mention Award)**
5. **Monga M**, E Groppo, RS Meyer and A Hargens. Genetic determination of urinary stone risk in identical twins. 20th World Congress of Endourology and Shockwave. Genoa, Italy, 2002. Journal of Endourology 16 (Suppl) PO4-5, 2002 **(Awarded Prize for Best Overall Paper from 1200 submitted)**
6. **Macias B**, H Tran Cao, B Lee, M Bawa, E Groppo, R Pedowitz, A Hargens. Physiologic responses of lower body negative pressure treadmill exercise as a training modality. American College of Sports Medicine (ACSM) SW Chapter, Las Vegas, Nevada, 2002. **(Student Award from American College of Sports Medicine (ACSM) SW Chapter, Las Vegas, Nevada, 2002)**
7. **Groppo E**, R Ng, R Eastlack, A Cutuk, G Schmid-Schonbein, A Hargens and R Pedowitz. Quantifying neutrophil activation with xylenol orange reaction: a possible method for detecting systemic activation. FASEB Journal 16: A82(121.3), 2002. **(Zweifach Student Award from the Microcirculatory Society)**
8. **Bawa, M**, ER Groppo, GC Steinbach, SM Lee, SM Smith, AR Hargens, RS Meyer. Lower body negative pressure treadmill exercise prevents the spinal deconditioning of astronauts in simulated space flight. American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, Louisiana, 2003 **(First Prize Award for the Rehabilitation and Spine Division at the American Academy of Orthopaedic Surgeons)**
9. **Keehan MM**, SMC Lee, DE Watenpaugh, SM Schneider and AR Hargens. Simultaneous exercise and lower body negative pressure countermeasure during bed rest protects exercise capacity. 7th Congress of the International Society for Adaptive Medicine, San Diego, California, 2003. **(First Place Student Award)**
10. **Kimura S**, GC Steinbach, DE Watenpaugh and AR Hargens. Lower body negative pressure treadmill exercise may maintain lumbar spinal structure and function during 30 days of bedrest. 7th Congress of the International Society for Adaptive Medicine, San Diego, California, 2003. **(Second Place New Investigator Award)**
11. **Wiemann JM**, T Ueno, AK Schwartz, WT Yost and AR Hargens. Noninvasive measurements of intramuscular pressure using ultrasound for detecting compartment syndromes. Western Student

Medical Research Forum, 2003. **(Subspecialty Award Winner in the Western Student Medical Research Forum, one of only 20 selected for this honor from a total of 354 submissions)**

12. **Eastlack RK**, AR Hargens, ER Groppo, GC Steinbach, KK White and RA Pedowitz. Lower body positive pressure exercise after knee surgery. *Clinical Orthopaedics and Related Research*, 2003 **(Recipient of the Jacquelin Perry Award from the Orthopaedic Rehabilitation Association)**
13. **Macias BR**, DE Watenpaugh, D O'Leary, SM Schneider, SMC Lee and AR Hargens. Supine lower body negative pressure exercise maintains orthostatic tolerance in men and women after 30-d bed rest. 15th Humans in Space Symposium, No. 11.8.2-3, Graz, Austria, 2005. **(International Travel Award and First Place Award)**
14. **Meuche S**, SM Schneider, SMC Lee, BR Macias, DE Watenpaugh and AR Hargens. Supine treadmill exercise in lower body negative pressure combined with resistive exercise counteracts bone loss, reduced aerobic upright exercise capacity, and reduced muscle strength. *American College of Sports Medicine, SW Chapter, San Diego, CA*, 2006. **(Student Award from American College of Sports Medicine, SW Chapter)**
15. **Brandon R. Macias, Tom K. Scott Award for best abstract and oral presentation in the field of Gravitational and Space Biology, American Society for Gravitational and Space Biology**, 27 October 2007.
16. **Macias BR**, SM Schneider, SMC Lee, P Guinet, S Meuche, RL Hughson, SM Smith, SR Zwart, DE Watenpaugh, and AR Hargens. WISE-2005: Lower Body Negative Pressure Treadmill Exercise and Resistive Exercise Countermeasure Maintain Physiologic Function in Women during 60-days of Bed Rest. *American Society for Gravitational and Space Biology 2007*, Poster B10 **(First Place Poster Award)**. October 2007
17. **Neuschwander TB**, Macias BR, and AR Hargens. Backpack straps significantly decrease brachial artery blood flow. *American College of Sports Medicine, SW Chapter, San Diego, CA*, 2007. **(Award from American College of Sports Medicine, SW Chapter)**
18. **David Hakopian**, undergraduate mentee, won the **2007 UC San Diego Undergraduate Library Research Prize** competition co-sponsored by the UCSD Libraries and the Vice-Chancellor of Student Affairs. His research involved studies of hydrostatic blood pressure during microgravity produced by parabolic flight.
19. **Macias BR**, SM Schneider, SMC Lee, P Guinet, S Meuche, RL Hughson, SM Smith, SR Zwart, DE Watenpaugh, and AR Hargens. WISE-2005: Lower Body Negative Pressure Treadmill Exercise and Resistive Exercise Countermeasure Maintain Physiologic Function in Women during 60-days of Bed Rest. **(American Physiological Society: Exercise & Environmental Physiology Section, Gravitational Physiology Pre-doctoral Award)** 7 April 2008
20. **Sara Richardson**, undergraduate mentee, won the **2009 UC San Diego Undergraduate Library Research Prize** competition co-sponsored by the UCSD Libraries and the Vice-Chancellor of Student Affairs. Her research was titled "Simulation of EVA Suit Effects during Lunar and Martian Analog Exercise".
21. **JR Bachman**, undergraduate mentee, **Second Place Award, 2010 UC San Diego Undergraduate Library Research Prize** competition co-sponsored by the UCSD Libraries and the Vice-Chancellor

of Student Affairs. His research was titled “Lower Limb Bone and Muscle Blood flow and Oxygenation Changes with Body Tilt”.

22. **Mehria Sayad-Shad**, undergraduate mentee, **2010 Norman James Award** at the American College of Sports Medicine, SW Chapter in San Diego, CA, 2010. Her research was titled “Blood Flow and Oxygenation are Modulated by External Pressure during Isometric Muscle Contractions”, 23 October 2010
23. **Mehria Sayad-Shad**, undergraduate mentee, **2011 David S. Bruce Outstanding Undergraduate Abstract Award** from the American Physiological Society, based on abstract, 1-page letter, and support letter. 24 February 2011
24. **Mehria Sayad-Shad**, undergraduate mentee, **David S. Bruce Excellence in Undergraduate Research Award** from the American Physiological Society at EB 2011 for “Excellence in Undergraduate Research Award by presenting a poster to an APS review committee onsite at the Experimental Biology meeting, Washington, DC, 10 April 2011
25. **JR Bachman**, Edward Grigoryan, Kevin Patterson, Thomas Hegstad, Mehria Sayad-Shah, Alan Hargens, “Modeling Intracranial Pressure in Microgravity during Parabolic Flight”, **Student First Place Poster Award** from American Society for Gravitational and Space Biology 2011, 5 November 2011
26. **Kevin Anderson**, **APS/NIDDK Minority Travel Fellowship Award** from the American Physiological Society at the Experimental Biology meeting, San Diego, CA, 21 April 2012
27. **JR Bachman**, undergraduate mentee, **2012 David S. Bruce Outstanding Undergraduate Abstract Award** from the American Physiological Society, based on abstract, 1-page letter, and support letter. 22 February 2012
28. **JR Bachman**, undergraduate mentee, **David S. Bruce Excellence in Undergraduate Research Award** from the American Physiological Society, based on research presentation to the APS Education Committee 22 April 2012
29. **Sandra Thao**, undergraduate mentee, **2013 Student Research Award** at the American College of Sports Medicine, SW Chapter in Newport Beach, CA. Her research was titled “Leg Blood Flow and Limb Circumference with Altered External Pressure for Prostheses in Sports” 18 October 2013
30. **Davina Moossazadeh**, Canyon Crest High School mentee, **2014 Engineering Scholar**, Society of American Military Engineers, April 2014.
31. **Shannon Baird**, teacher mentee at The Preuss School UCSD, **American Physiological Society Research Teacher Professional Development Fellowship**: La Jolla, CA. 2014
32. **Erika Clary**, undergraduate mentee, **American Physiological Society Undergraduate Summer Research Fellowship**, 2014
33. **Jacqueline Holt**, medical student mentee, **Michael L. Pollock Student Scholarship** for abstract, Holt J, BR Macias, R Healey, SMC Lee, SM Schneider, A Snyder, DG Chang, and AR Hargens. WISE 2005: Aerobic and Resistive Exercises Protect Lumbar Paraspinal Lean Muscle Mass during 60 day Bed Rest in Women. American College of Sports Medicine, San Diego, CA 2015.

34. **Alex Snyder**, medical student mentee, **APS Excellence in Professional Student Research Travel Award** for abstract Snyder AJ, BR Macias, R Healey, JA Holt, DG Chang, JC Lotz, and AR Hargens, Lumbar Paraspinal Muscle Atrophy during Long Duration Spaceflight. Experimental Biology, Boston, MA 2015.
35. **Alex Snyder**, medical student mentee, **American Physiological Society Exercise & Environmental Physiology Section's National Space Biomedical Research Institute's Gravitational Physiology Predoctoral Award**, Experimental Biology, Boston, MA 2015.
36. **Jamila Siamwala**, Postdoctoral mentee, **American Physiological Society Exercise & Environmental Physiology Section's National Space Biomedical Research Institute's Gravitational Physiology Beginning Investigator Award** for abstract Siamwala JH, BR Macias, R Healey, and AR Hargens. Cerebral Vascular Changes in Space Mice Calvaria. Experimental Biology, Boston, MA 2015.
37. **Timothy Macaulay**, undergraduate mentee, **Julia Brown Undergraduate Research Scholarship** to support his summer research opportunity in the Clinical Physiology Research Laboratory titled "Altered Residual Limb Volume Associated with a Vacuum-Assisted Prosthesis" 2015.
38. **Sravya Challa**, medical student mentee, **2015 Student Research Award** for abstract Muscle Microvascular Blood Flow, Oxygenation, and pH as Potential Diagnostic Parameters in Athletes with Chronic Exertional Compartment Syndrome at the American College of Sports Medicine, SW Chapter in Newport Beach, CA 2015
39. **Timothy Macaulay**, undergraduate mentee, **2015 Student Research Award** for abstract Lower Body Negative Pressure Treadmill Exercise Attenuates Simulated Space Flight-Induced Reductions of Balance Abilities in Males but Not Females at the American College of Sports Medicine, SW Chapter in Newport Beach, CA 2015
40. **Richard Valle, Euan Tan, Kristine Khieu, and Kyle Gillespie**, undergraduate student finalists for designing and building a asteroid chipping and sampling device "Rock Extraction Chipping Container", as part of the MicroG-NExT competition at NASA-Johnson Space Center, April 2016.

Scientific/Research Advisory Board Memberships

- | | |
|--------------|---|
| 1995-2000 | Member of the Scientific Board, CIRCAID Medical Products, Inc., San Diego, CA |
| 1998-present | Member of the Scientific Board, DynaMed, Stockholm, Sweden |

Professional Society Memberships:

- | | |
|------|---|
| 1965 | Phi Beta Kappa |
| 1966 | American Chemical Society |
| 1967 | American Association for the Advancement of Science |
| 1974 | American Physiological Society |
| | 1989-1991; Member, Committee on Committees |
| | 2009-present; Member, APS Reynolds Award Review Committee |
| | 2010: Vice Chair, Translational Physiology Interest Group |

1976	Microcirculatory Society (U.S.)
1976	European Society for Microcirculation
1977	Orthopaedic Research Society
1978	Societe Internationale de Recherche Orthopedique et de Traumatologie (SIROT)
1980	International Society of Lymphology
1983	Aerospace Medical Association (Life Member and Fellow)
1989-present	Member, Scientific Program Committee
1990-1992	Member, Nominating Committee (Associate Fellows)
1983	American College of Sports Medicine
1985	American Society for Gravitational and Space Biology
1985	European Low Gravity Research Association
1985	IUPS Commission on Gravitational Physiology
1988	American Heart Association Council on Circulation
1996-present	International Society for Adaptive Medicine (President, 2003-2006; Board of Directors and Program Committee)
2004	International Academy of Astronautics "Humans in Space Symposium" (Program Committee Member)
2005	International Congress of Physiological Sciences (Symposium Chair)
2006-2009	Orthopaedic Research Society (Program Committee abstract reviewer)
2010-2014	Orthopaedic Research Society (Topic Chair and Member, Program Committee)
2010-present	International Society for Gravitational Physiology (Council of Trustees and Program Committee)

Research Expeditions (funding):

1967	R/V ALPHA HELIX Amazon Expedition (NSF)
1968	R/V ALPHA HELIX Bering Sea Expedition (NSF)
1969	Crater Lake, Oregon Expedition (NSF, NIH)
1970	R/V ALPHA HELIX Guadeloupe Island, Mexico Expedition (NSF)
1970	Tweedsmuir Salmon Expedition, Bella Coola, B.C., Canada (Fleischman Foundation)
1970-1971	R/V ALPHA HELIX Antarctic Expedition (NSF)
1978	R/V ALPHA HELIX Green Turtle Expedition (NSF)
1983	Pacific Billfish and Tuna Research (PGF)
1985	Giraffe Physiology Expedition, South Africa (NIH, NSF, National Geographic Society)
1991-1993	Giraffe Cardiovascular System, Omaha Zoo (NASA)

Teaching Experience (course number):

1969-1971	Topics of Environmental Physiology (SIO 294), Scripps Institute of Oceanography
1972	Comparative Physiology, University of Aarhus, Denmark
1973-1989	Independent Study (AMES-Bioengineering 199 and Biology 199), University of California, San Diego
1978	Advanced Cell Physiology (AMES-Bioengineering 274), University of California, San Diego
1977-1978	Doctoral Committee, Jorge Huacuz-Villamar, Department of AMES-Bioengineering, University of California, San Diego
1977-1987	Compartment Syndrome Pathophysiology, Diagnosis and Treatment, Department of Surgery, University of California, San Diego

1979-1987 Quantitative Physiology
A. Structure and Function (AMES-Bioengineering 271A)
B. Cardiovascular (AMES-Bioengineering 271B), University of California, San Diego

1979-1987 Transport Phenomena (AMES-Bioengineering 173, 272 and 273), University of California, San Diego

1980 Laboratory Projects in Biology (Biology 203 A, B, C), University of California, San Diego

1982-1983 Doctoral Committee, Peter Burkhard, Department of AMES-Bioengineering, University of California, San Diego

1982-1987 Surgery Research (Surgery 299), University of California, San Diego

1983-1984 Master's Committee, Suzanne Malloy, Department of AMES-Bioengineering, University of California, San Diego

1984-1987 Doctoral Committee, Tadachi Tamura, Department of AMES-Bioengineering, University of California, San Diego

1985-1987 Doctoral Committee, Donald W. Sutton, Department of AMES-Bioengineering, University of California, San Diego

1985-1988 Doctoral Committee, Joerg-Uwe Meyer, Department of AMES-Bioengineering, University of California, San Diego

1986-1988 Doctoral Committee, Amy Tsai, Department of AMES-Bioengineering, University of California, San Diego

1986-1988 Doctoral Committee, Sharon Gott, Department of AMES-Bioengineering, University of California, San Diego

1986-1989 Doctoral Committee, Michelle Mazzoni, Department of AMES-Bioengineering, University of California, San Diego

1987 Bioengineering Laboratory (AMES-Bioengineering 174), University of California, San Diego

1988-1989 Stanford med Student mentor for Scott Parazynski, M.D.

1989-1991 UC Davis MS mentor for Shannon Stout, B.S.

1991-1996 UC Davis Ph.D. mentor for Donald E. Watenpugh, M.S., M.A.

1988-1992 Colloquium on Life in Space (AA129), Department of Aeronautics and Astronautics, Stanford University, Course Coordinator

1993-1994 San Diego State MS mentor for Richard Ballard, B.S., Ph.D. mentor for Yuichiro Haruna, M.S.

1993-2001 Biology and Space Exploration, Program in Human Biology, Stanford University

1994-1995 UC Berkeley Ph.D. mentor for Gita Murthy, B.A.

1994-1996 Colorado State MS mentor for Anthony Artino, B.S. and Kjell Lindgren, B.S.

1995-1997 University of Tokyo Ph.D. student mentor for Kana Kuriyama, M.S., Stanford Med

1996-1998 Student mentor for James Campbell, M.S. and Christopher Yang, M.S.

1998 Space Biology Class (B0277), Department of Biology, North Carolina State, Guest Lecturer

1999-2000 Doctoral Committee, Jeff Bishop, Department of Bioengineering, University of California, San Diego

1998-present Compartment Syndrome Pathophysiology, Diagnosis and Treatment, Department of Orthopaedic Surgery, University of California, San Diego

2009-2011 Doctoral Committee, Cassondra L. Williams, Scripps Institution of Oceanography, University of California, San Diego

2010-2012 Research Advisor and Doctoral Committee Co-Chair, Jaime Mateus, Department of Aerospace Biomedical Engineering, Massachusetts Institute of Technology

Postdoctoral Fellows, Orthopaedic Residents, Graduate Students, Medical Students, and Visiting Faculty in Orthopaedic Physiology Lab at University of California, San Diego:

1975-1976	Ladd Rutherford, M.D.
1976-1977	Donald A. Schmidt, M.D.
1977-1978	Ray R. Castilonia, Ph.D., Steven R. Garfin, M.D., Charles M. Tipton, Ph.D.
1978-1979	Robert K. Smith, M.D., Scott A. Young, M.D.
1979-1980	Robert N. Gould, M.D., Ph.D., Patrick T. Hergenroeder, M.D.
1980-1981	Randy C. Barrows, M.D., Yu Fon Lee, M.D., Goran Lundborg, M.D., Ph.D.
1981-1982	Jan Fronck, M.D., Wayne W. Mortensen, M.D.
1982-1983	Kristin Kardel, M.S., Robert M. Szabo, M.D., Richard V. Williamson, M.D., Albert Simpkins, M.D., Nicholas C. Yaru, M.D.
1982-1985	Richard L. Lieber, Ph.D.
1982-1984	Randy O'Hara, M.D., Mark Silver, M.D.
1982-1987	Larry A. Danzig, M.D.
1983-1984	Jon Camp, M.D., Michael S. Gross, M.D., Michael M. Katz, M.D., William Pfeiffer, M.D., Charles E. Rhoades, M.D., Michael J. Skyhar, M.D., Will Stewart, M.D., Blake R. Thompson, M.D., Eric Zimmer, M.D.
1984-1985	Marcia K. Beckman, M.D., Jan Fridén, M.D., Ph.D., Lawrence Kurz, M.D., Alexander Rosenstein, M.D., Peter N. Sfakianos, M.D.
1985-1986	Tom Ferro, M.D., Mike Glover, M.D., Chris Guier, M.D., Michael Moore, M.D.
1986-1987	Ron Anderson, M.D., Tom Ferro, M.D., Sharon Gott, M.S., Robert Pedowitz, M.D., Ph.D., Björn Rydevik, M.D., Ph.D.
1998-1999	Masayuki Matsuyama, M.D., Ph.D., Sonya Waters, M.D., Klane White, M.D.
1999-2000	Shinji Kimura, MD., Ph.D; Murali Adusumalli, MD, Gregory Steinbach, PhD., Hansen Noh, BS, Tom Stoll, BS, Tuan Nguyen, BS, MS.
2000-2002	Shinji Kimura, MD, PhD; Robert Eastlack, MD; Kunihiko Tanaka, MD, PhD; Gregory Steinbach, PhD; Kevin Kuhn, MD; Maneesh Bawa, MD; Brandon Macias, BS; Meghan Imrie, BS; Jaideep Iyengar, BS; Pranat Kumar, BS; Pieter Stoop, BS; Ramsford Ng, BS; Vid Upasani, BS.
2002-2004	Maneesh Bawa, MD, UCSD orthopaedic resident; Jaideep Iyengar, medical student; Kunihiko Tanaka, MD, PhD, postdoc fellow; Aimee Schmizzi, MD, UCSD orthopaedic resident; Nicole Khalili, BS; Alan Ka, MD, NIH Orthopaedic Trainee; Hop Tran, medical student; Bryan Leek, MD, UCSD orthopaedic resident; Peihong Cao, MD, postdoc fellow; Josh Yune, MD, postdoc fellow; Patrick Danaher, medical student; Kentaro Suzuki, medical student; John Wiemann, medical student; Kevin Tse, medical student.
2004-2006	Patrick Guinet, MD, postdoc fellow; Ranjeet Minocha, medical student; Tim Neuschwander, MD, NIH Orthopaedic Trainee, Qiuxia Zhang, MD, PhD, postdoc fellow; Andrew Indresano, medical student; Brandon Gabel, undergraduate student; Nick Schneider, BS; Vidhi Doshi, undergraduate student; Sabine Vogler, medical student.
2006-2008	Tea Nguyen, undergraduate student; Cassie Kline, BA; Jong Kim, MD, PhD, postdoc fellow; Emily Kraus, undergraduate student; David Hakopian, undergraduate student; Junichiro Yamauchi, postdoc fellow; Keisuke Kida, postdoc fellow; Gary Murphey, NIH Orthopaedic Trainee; Tim Neuschwander, UCSD Orthopaedic resident; Miles Wilkinson, undergraduate student; Alexis Gaskin, undergraduate student; Pascual Dutton, medical student; Heidi Ruckstuhl, PhD, postdoc fellow; Jennifer Kho, medical student; Sara Richardson, undergraduate student.

2009-2010 Gary Murphey, NIH Orthopaedic Trainee; Tim Neuschwander, UCSD Orthopaedic resident; Miles Wilkinson, undergraduate student; Alexis Gaskin, undergraduate student; Pascual Dutton, medical student; Heidi Ruckstuhl, PhD, postdoc fellow; Jennifer Kho, medical student; Sara Richardson, undergraduate student, Armando Rosales, postdoc fellow; Ravindra Kumar, postdoc fellow; Julia Tomlin, medical student; Matt Weed, medical student; Mike Cardno, medical student from Aberdeen, Scotland; Sean Mazloom, medical student; Thomas Schlabs, medical student; Moses Lipshaw, undergraduate student; JR Bachman, undergraduate student; Michael Yeranosian, medical student; Jaime Mateus, PhD student

2011-2012 Thomas Schlabs, medical student from Berlin, Germany; Mehria Sayad-Shad, UCSD undergraduate student; JR Bachman, UCSD undergraduate student; Samantha Lee, UCSD medical student; Jaime Mateus, PhD student from MIT; Michael Padilla, UCSD orthopaedic lab resident; Bing Zhang, UCSD medical student; Kevin Anderson, UCSD undergraduate student; Ronald Crater, UCSD orthopaedic lab resident; Susan Aminzai, UCSD undergraduate student; Roshmi Bhattacharya, UCSD undergraduate student; Sae Hoon Kim, MD, PhD, postdoctoral fellow from Seoul, Korea; Brittany Lim, UCSD; undergraduate student; Clifford Mao, UCSD; undergraduate student; Ibrahim Yusufu, STARS undergraduate student from UC, Merced; Michael Ramirez, UCSD medical student; Stephen Shymon, UCSD medical student

2012-2013 Mehria Sayad-Shad, UCSD undergraduate student; Samantha Lee, UCSD medical student; Jaime Mateus, PhD student from MIT; Michael Padilla, UCSD orthopaedic lab resident; Bing Zhang, UCSD medical student; Kevin Anderson, UCSD undergraduate student; Ronald Crater, UCSD orthopaedic lab resident; Roshmi Bhattacharya, UCSD undergraduate student; Sae Hoon Kim, MD, PhD, postdoctoral fellow from Seoul, Korea; Clifford Mao, UCSD undergraduate student; Stephen Shymon, UCSD medical student; Brandon Macias, PhD, UCSD postdoctoral fellow; Jamila Siamwala, PhD, UCSD postdoctoral fellow from India; Noelia Grande Gutiérrez, graduate student from Spain; Sandra Thao, UCSD undergraduate student; Eهران Khan, UCSD undergraduate student

2013-2014 Paul Lee, UCSD undergraduate student; Johnny Fu, UCSD undergraduate student; Gautam Srinivasan, UCSD undergraduate student; Yuki Iizuka, UCSD medical student; Michael Padilla, UCSD orthopaedic lab resident; Bing Zhang, UCSD medical student; Noelia Grande Gutiérrez, UCSD graduate student; Ronald Crater, UCSD orthopaedic lab resident; Roshmi Bhattacharya, UCSD graduate student; Sae Hoon Kim, MD, PhD, postdoctoral fellow from Korea; Clifford Mao, UCSD undergraduate student; Stephen Shymon, UCSD medical student; Brandon Macias, PhD, UCSD Postdoctoral Fellow; Jamila Siamwala, PhD, UCSD Postdoctoral Fellow; Sandra Thao, UCSD undergraduate student; Eهران Khan, UCSD undergraduate student, Davina Moossazadeh, Canyon Crest Academy

2015-2016 Paul Lee, UCSD undergraduate student; Yuki Iizuka, UCSD medical student; Noelia Grande Gutiérrez, UCSD graduate student; Ronald Crater, UCSD orthopaedic lab resident; Roshmi Bhattacharya, University of Alabama medical student; Brandon Macias, PhD, UCSD Postdoctoral Fellow; Jamila Siamwala, PhD, UCSD Postdoctoral Fellow; Jacqueline Holt, University of Washington medical student; Michelle Howden, UCSD undergraduate student; Timothy Macaulay, UCSD undergraduate student; Sravya Challa, UCSD medical student; William Watkins, UCSD medical student; Ted Kawai, UCSD undergraduate student; Rachel Becker, UCSD undergraduate student, Davina Moossazadeh, University of Chicago undergraduate student; James Hubbard, UCSD orthopaedic lab resident; Kristine Khieu, UCSD undergraduate student; Richard Valle, UCSD undergraduate student; Stephanie Vallarino, UCSD graduate student

Postdoctoral Fellows, Graduate Students, Medical Students, and Visiting Faculty in Space Physiology Lab:

1987-1988	Michael Aratow, M.D., Scott Parazynski, M.D., Brian Quigley, Ph.D., Jorma Styf, M.D., Ph.D.
1988-1989	Michael Aratow, M.D., J.-Uwe Meyer, Ph.D., Scott Parazynski, M.D., Jorma Styf, M.D., Ph.D., Bryan Tucker, M.S.,
1989-1990	Michael Aratow, M.D., J.-Uwe Meyer, Ph.D., Jorma Styf, M.D., Ph.D.
1990-1991	J.-Uwe Meyer, Ph.D., M. Shannon Stout, B.S.
1991-1992	Gregory A. Breit, Ph.D., Yasuaki Kawai, M.D., Ph.D., M. Shannon Stout, M.S., Charles M. Tipton, Ph.D.
1992-1993	Gregory A. Breit, Ph.D., Harvey B. Lillywhite, Ph.D., Jorma Styf, M.D., Ph.D., Donald E. Watenpaugh, M.S., M.A.
1993-1994	Richard Ballard, B.S., Yuichiro Haruna, Ph.D., Harvey Lillywhite, Ph.D., Jorma Styf, M.D., Ph.D., Professor Shigeyo Torikoshi, Donald Watenpaugh, M.S., M.A.
1994-1995	Richard Ballard, B.S., Wanda Boda, Ph.D., Harvey Lillywhite, Ph.D., Gita Murthy, B.A., Professor Shigeyo Torikoshi, Donald Watenpaugh, M.S., M.A.
1995-1996	Anthony Artino, B.S., Richard Ballard, B.S., Wanda Boda, Ph.D., Andrew Ertl, Ph.D., Kana Kuriyama, M.S., Harvey Lillywhite, Ph.D., Kjell Lindgren, B.S., Iwane Mitsui, M.D., Gita Murthy, B.A., Toshiaki Ueno, M.D., Ph.D., Donald Watenpaugh, Ph.D.
1996-1997	Richard Ballard, M.S., Wanda Boda, Ph.D., James Campbell, M.S., Andrew Ertl, Ph.D., Kana Kuriyama, M.S., Harvey Lillywhite, Ph.D., Masayuki Matsuyama, M.D., Ph.D., Iwane Mitsui, M.D., Gita Murthy, M.S., Toshiaki Ueno, M.D., Ph.D., Christopher Yang, M.S.
1997-1998	Wanda Boda, Ph.D., James Campbell, M.S., Masayuki Matsuyama, M.D., Ph.D., Gita Murthy, M.S., Elizabeth Sánchez, B.S.
1998-1999	Wanda Boda, Ph.D., Gita Murthy, M.S., James Campbell, M.S.

Editorial Service:

1977-2014	Microvascular Research
1978-present	American Journal of Physiology (Editorial Board, Heart and Circulatory Physiology, 1990-1994)
1980-1991	Journal of Comparative Physiology
1980-present	Journal of Bone and Joint Surgery (Editorial Consultant)
1982-2006	Journal of Theoretical Biology
1982-1998	Science
1983-present	Journal of Orthopaedic Research (Associate Editor, 1984-1992)
1983-present	Journal of Applied Physiology
1984-1987	Journal of Biomechanical Engineering
1985-present	Medicine and Science in Sports and Exercise
1986-1987	Archives of Surgery
1986-1990	Anesthesiology
1987-2009	American Journal of Sports Medicine
1987-1996, 2004	Nature
1988-1995	Behavioral and Brain Sciences (Associate)
1988	Critical Reviews in Biomedical Engineering (Associate Editor)
1989	American Journal of Obstetrics and Gynecology
1989	CRC Press
1989-present	Journal of Biomechanics

1990	Pflügers Archiv (European Journal of Physiology)
1991-present	Aviation, Space and Environmental Medicine
1992-present	FASEB Journal
1993-present	Journal of Experimental Biology
1993-2009	American Journal of Cardiology
1993-present	Microcirculation
1994-2000	Acta Physiologica Scandinavica
1994-present	Comparative Biochemistry and Physiology
1995-present	Journal of Gravitational Physiology (Associate Editor, 1998 - present)
1996-present	Spine
1997-present	European Journal of Applied Physiology
1998-present	Clinical Orthopaedics and Related Research
2002-2006	Clinical Physiology and Functional Imaging – Microcirculation
2002-2003	Brain Research
2003-present	Japanese Journal of Physiology (Associate Editor and Editorial Board Member)
2003-present	Orthopaedic Research Society Program Reviewer
2004-present	The Journal of Physiology
2004-2009	Scandinavian Journal of Medicine and Science in Sports
2004-2011	Neuroscience Letters
2005	Applied Mathematics Letters
2005-2014	Applied Physiology, Nutrition and Metabolism
2005-present	Acta Astronautica
2006	Journal of Clinical Endocrinology and Metabolism
2006-present	Physiological Measurement
2006-present	Advances in Physiology Education
2006-2014	Journal of Cerebral Blood Flow and Metabolism
2006-present	Muscle and Nerve
2006-present	Journal of Orthopaedic Trauma
2007	Biotechnology and Bioengineering
2007	Musculoskeletal Disorders
2007-2009	International Conference on Environmental Systems
2007	Applied Physiology, Nutrition and Metabolism
2007-2009	British Journal of Sports Medicine
2007-present	Archives of Physical Medicine and Rehabilitation
2007	Microgravity Science and Technology
2008	Cardiovascular Research
2009-present	Adaptive Medicine (Associate Editor, 2009 - present)
2010-present	Gravitational and Space Biology
2011-present	Orthopedic & Muscular System (Editorial Board Member)
2011-present	Frontiers in Physiology (Editorial Board Member)
2011-present	Advances in Space Research
2011-present	PLoS One
2013-present	Orthopedic & Muscular System: Current Research (Executive Editor)

Government Public Advisory Service:

1988-1995	Chair, Science Working Group, Space Station Centrifuge Facility, NASA
1989-1991	Member, Cardiopulmonary Discipline Working Group, NASA Headquarters, Life Sciences Division
1993-1996	Member, Merit Review Board for Surgery, Department of Veterans Affairs

2002-2003 Chair, NASA Panel for Program “Human Health from Earth to Space: A NASA-MU Partnership for Understanding Sex Differences in Physiology”

2003 Member, NASA Headquarters Committee on Development of Countermeasures for Long Duration Space Flight

2003-2008 Member, International Multidisciplinary Artificial Gravity Project Review

2007 Invited Lecturer, Canadian Space Agency Bed-Red Workshop

2008 Invited Speaker and Discussant for NASA, International Cardiovascular Workshop for Space Flight, Strasbourg, France.

2009-2011 Member and Acting Chair, Integrative and Translational Research for the Human Systems Panel, National Academy of Sciences Decadal Study of Life Sciences in Space.

2009-2011 Co-Chair, NASA Human Health Countermeasure Element Standing Review Panel

2009-2011 Invited Reviewer, NASA Human Research Program Cardiovascular Risks Panel

2009 Invited Discussant, NASA Head-Up Tilt Bed Rest for Flight Analogs Project

2010-present Member, National Institute of General Medical Sciences Special Emphasis Panel

2014 Invited Speaker and Discussant for NASA, Experimental Biology 2014 Symposium: International Space Station Research Results and Opportunities

Research Grant Review Service:

1979-1987 Regulatory Biology Program, National Science Foundation

1981-1984 Polar Biology and Medicine Program, National Science Foundation

1981-present Veterans Administration Research and Development (Surgery Merit Review Board member, 1993-1996)

1982-1985 Medical Research Council of Canada

1983-1987 American Heart Association

1983-1988 Orthopaedic Research and Education Foundation

1984-1993 Division of International Programs, National Science Foundation

1984-1987 National Institute of Arthritis and Musculoskeletal and Skin Diseases

1984-1994 American Institute of Biological Sciences

1987-present National Aeronautics and Space Administration

1988-1989 Program Project Reviewer, National Institute of Arthritis and Musculoskeletal and Skin Diseases

1990-1996 Wellcome Trust (London)

1996-present Austrian Science Foundation

1997-present NATO Scientific Affairs Division (Brussels)

1998-present Natural Sciences and Engineering Research Council of Canada

2002-present U.S. Civilian Research & Development Foundation (CRDF) for the Independent States of the Former Soviet Union

2009 South Carolina NASA EPSCoR Research and Education Awards Program

2008-2009 Member, American Heart Association Peer-Review Committee for Research

2008-present European Space Agency, NWO/SRON Programme Bureau Space Research, Utrecht, The Netherlands

2013-present Peer Review Member, NASA Space Biology Musculoskeletal Panel

2013-present Peer Review Member, NASA Space Biology Cardiovascular Panel

2013-2015 Peer Review Member, NSBRI Postdoctoral Fellow Panel

2014-present Peer Review Member, DoD MRMC/CDMRP, Orthopaedic Research Program, Clinical Trial Panel

Other Recent Service

2009-2013	Member, UCSD Recruitment and Admissions Committee
2009-2013	Member, Cardiovascular Awards Committee, American Physiological Society
2009-present	Member, Orr E. Reynolds Award Committee, American Physiological Society
2009-present	Member, Clinical Data Access Taskforce, UCSD Health Sciences Committee
2010-2013	Vice Chair and Member, Translational Physiology Interest Group, American Physiological Society
2013-present	Chair and Member, Translational Physiology Interest Group, American Physiological Society

Research Grant Awards (role in project):

1976-1980	Pathophysiology of the Compartment Syndrome, AM-18824 (Co-Principal Investigator with Wayne H. Akeson, M.D.), National Institute of Arthritis, Metabolism and Digestive Diseases, \$400,000
1977-1982	Interstitial Tissue and Oncotic Pressure in Trauma, GM-24901 (Co-Principal Investigator with Richard M. Peters, M.D.), National Institute of General Medical Sciences, \$325,000
1979-1984	Effects of Tourniquet Ischemia on Skeletal Muscle, AM-00602 (Principal Investigator), Research Career Development Award, National Institute of Arthritis, Metabolism and Digestive Diseases, \$200,000
1979-1982	Tourniquet Ischemia Effects on Skeletal Muscle and Nerve, AM-25501 (Principal Investigator), National Institute of Arthritis, Metabolism and Digestive Diseases, \$150,000
1979-1984	Wick Catheter and Bioengineering Studies of Neuromusculoskeletal Diseases (Principal Investigator), Veterans Administration, \$185,000
1980-1981	Tissue-Fluid Shifts and Muscle Function in Humans During Weightlessness, NAS 9-16039 (Principal Investigator), National Aeronautics and Space Administration, Definition-Phase Study, \$35,000
1982-1985	Pathophysiology of the Compartment Syndrome, AM-26344 (Principal Investigator), National Institute of Arthritis, Diabetes, Digestive and Kidney Diseases, \$227,000
1982-1987	Interstitial Tissue and Oncotic Pressure in Trauma, GM-24901 renewal (Co-Principal Investigator with Richard M. Peters, M.D.), National Institute of General Medical Sciences, \$632,000
1983-1986	Tourniquet Ischemia Effects on Skeletal Muscle and Nerve, AM-25501 renewal, (Principal Investigator), National Institute of Arthritis, Diabetes, Digestive and Kidney Diseases, \$200,000
1983-1985	Skeletal Muscle Recovery after Immobilization with and without Stimulation (Co-Principal Investigator with Richard L. Lieber, Ph.D.), Mentor Corporation, \$10,000
1984-1987	Muscle Physiology of Compression Injury, Stroke & Electrical Stimulation (Principal Investigator), Veterans Administration, \$150,000

1985-1986 Orthostatic Adaptation in the Giraffe, HL-32703 (Principal Investigator), National Heart, Lung and Blood Institute, \$60,000

1985-1986 Tissue Adaptation to Natural Hypertension, DCB-8409253 (Principal Investigator), National Science Foundation, \$20,000

1985-1988 Pathophysiology of the Compartment Syndrome, AM-26344 renewal (Principal Investigator), National Institute of Arthritis, Diabetes, Digestive and Kidney Diseases, \$270,000

1985-1987 Management of Chronic, Exertional Compartment Syndromes (Principal Investigator), Veterans Administration, supplemental project, \$30,000

1985-1986 Orthostatic Adaptation in the Giraffe, 3072-85 (Principal Investigator), National Geographic Society, \$10,000

1986-1987 International Congress on Interstitial-Lymphatic Liquid and Solute Movement (Co-Investigator with Norman C. Staub, M.D.), National Heart, Lung and Blood Institute, \$12,500

1986-1987 Intracompartmental Measurements of Fluid Pressure (Principal Investigator), Camino Laboratories, \$4,100

1987-1990 Pathophysiology of Chronic Compartment Syndrome and Nerve Root Compression (Principal Investigator), Veterans Administration, \$249,000

1987-1988 Space Physiology: Cardiovascular and Musculoskeletal Adaptations to Weightlessness (Principal Investigator), NASA, \$300,000

1988-1990 G_x Effects on Cardiopulmonary Injury in Rhesus Monkeys as Related to CERV (Principal Investigator), NASA, \$180,000

1988-1991 Transcapillary Fluid Shifts during Simulated Weightlessness and Subsequent Orthostatic Recovery (Principal Investigator), NASA, \$450,000

1989-1990 Development of Exercise Equipment for Long-Duration Spaceflight (Principal Investigator), NASA, \$70,000

1990-1991 Development and Experimental Verification of a Noninvasive Intracranial Pressure Recording System (Principal Investigator), NASA, \$70,000

1992-1994 Exercise within an LBNP Chamber to Produce Artificial Gravity (Principal Investigator), NASA, \$460,000

1992-1994 Pathophysiology of Back Pain in Microgravity (Principal Investigator), NASA, \$150,000

1994-1995 Intervertebral Disc and Back Pain Studies using Spinal Traction and Compression during Magnetic Resonance Imaging (Principal Investigator), NASA, \$80,000

1994 A Noninvasive Acoustic Diagnostic Device to Measure Intracranial Pressure (Principal Investigator), NASA, \$50,000

1995-1996 Tissue Oxygenation as an Objective Tool for Diagnosing Repetitive Motion Disorders (Principal Investigator), NASA, \$80,000

1995-1996 Exercise within LBNP to Produce Artificial Gravity (Principal Investigator), NASA, \$472,000

1996-1999 Noninvasive Intracranial Volume and Pressure Measurements Using Ultrasound, (Principal Investigator) U.S. Army, \$324,743

1996-1999 Noninvasive Intracranial Diameter and Pressure Measurements Using Ultrasound, (Principal Investigator), NASA, \$283,155

1997-1998 MRI-Compatible Spinal Compression Harness, (Principal Investigator), ARC Commercial Technology Fund, \$75,000

1997-2002 Exercise within LBNP to Produce Artificial Gravity (Principal Investigator), NASA, \$713,245

1998-2002 Quality and Safety Assurance of Noninvasive Intracranial Pressure Measurement Instrument (Principal Investigator), NASA-LaRC, \$190,000

2000-2001 Development of Cervical Spine Compression Harness (Principal Investigator), DynaMed, Inc., \$52,000

2000-2003	Physiological Effects of a Mechanical Counter Pressure Suit (Contract Principal Investigator), Honeywell, Inc., \$288,000.
2002-2004	Ultrasonic Measurement of Intracranial Pressure Waveforms (Principal Investigator), NASA NAG 1-2092, \$85,000.
2002-2005	Exercise within LBNP as an Artificial Gravity Countermeasure (Principal Investigator), NASA, NAG 9-1425, \$750,858
2003-2004	US Army Support of 2003 Congress of the International Society of Adaptive Medicine (Principal Investigator), US Army DAMD17-03-1-0503, \$19,000
2003-2004	NASA Support of 2003 Congress of the International Society of Adaptive Medicine (Principal Investigator), NASA NNG04GB54G, \$19,000
2003-2005	Non-Invasive Device for Diagnosis of Compartment Syndrome (Principal Investigator), US Army/Luna, \$304,788
2004-2007	LBNP Treadmill and Resistive Exercises during Long-Term Bed Rest (Principal Investigator), ESA/NASA/CNES, NASA NNJ04HF71G \$714,503
2004-2009	Role of Intracranial Pressure in Space Adaptation Syndrome (Co-Investigator), NASA NNJ04HD94A, \$564,624 (UCSD component)
2006-2007	Interstitial Fluid Pressure Distribution beneath a KCI Negative Pressure Dressing (Principal Investigator), KCI USA, Inc., \$105,200
2006-2007	Non-Invasive Device for Diagnosis of Compartment Syndrome (Principal Investigator), NIH/Luna, \$33,000
2006-2008	Comparison of Elastic and Inelastic Compression Devices (Principal Investigator), CircAid Medical Products, Inc, \$36,000
2007-2008	Effect of Recombinant Hyaluronidase on Interstitial Fluid Flow and Pressure in a Pc-3 Prostate Cancer Xenograft Model (Principal Investigator), Halozyme, Inc, \$163,000
2008-2011	Noninvasive Diagnosis of Compartment Syndrome (UCSD Principal Investigator), NIH R44 AR053750, \$282,000
2008-2013	Rodent Spine Deconditioning after 30 Days of Microgravity (Principal Investigator), NASA NNX09AP11G, \$150,000
2010-2013	Risk of Intervertebral Disc Damage after Prolonged Space Flight (Principal Investigator), NASA NNX10AM18G, \$1,167,000
2012-2013	Fluid Distribution before, during and after Prolonged Space Flight-Definition Phase (Principal Investigator), NASA NNX12AL66G, \$70,000
2013-2019	Fluid Distribution before, during and after Prolonged Space Flight (Principal Investigator), NASA NNX13AJ12G, \$1,179,073
2013-2018	Risk of Intervertebral Disc Damage after Prolonged Space Flight (Principal Investigator), NASA NNX13AM89G, \$1,343,404
2014-2017	Spinal Structure and Function after 90 Days Long-Duration Simulated Space Flight and Recovery (Principal Investigator), NASA NNX14AP25G, \$300,000

Patents:

1. Hargens AR and SJ Mubarak. Wick Catheter Pressure Sensing Probe and Method of Use (U.S. Patent 4,192,319 issued 11 March 1980 and reissued 15 June 1982 as 30,966).
2. Whalen RT and AR Hargens. Exercise Method and Apparatus Utilizing Differential Air Pressure (U.S. Patent 5,133,339 issued 28 July 1992).
3. Yost WT, JH Cantrell and AR Hargens. Method of Determining Intracranial Pressure from Pulsatile Skull Expansions (NASA Case No. LAR 15499-1-CU; U.S. Patent filed, 2002).

4. Hargens AR, K Tanaka and J Waldie. Method and Device to Enhance Blood Flow (UCSD 2001-212; U.S. Patent filed, 2003).
5. Yost WT, JH Cantrell and AR Hargens. Non-invasive Method of Determining Diastolic Intracranial Pressure (U.S. Patent 6,740,048 issued 25 May 2004).
6. Yost WT, JH Cantrell and AR Hargens. Non-invasive Method of Determining Absolute Intracranial Pressure (U.S. Patent 6,773,407 issued 8 August 2004).
7. Ueno T, AR Hargens and WT Yost. Ultrasonic Apparatus and Method to Assess Compartment Syndrome (NASA Case No. LAR 16406-1-CU; U.S. Patent filed, 2004).
8. Hargens AR, BR Macias, TB Neuschwander and Q Zhang. Method and Apparatus for Increasing Blood Flow in a Body Part (UCSD Case No. 2005-185-1; Provisional U.S. Patent filed 19 May 2006).

Books/ Journal Supplements:

1. Hargens AR. Tissue Fluid Pressure and Composition, Baltimore: Williams and Wilkins, 275 pages, 1981.
2. Mubarak SJ and AR Hargens. Compartment Syndromes and Volkmann's Contracture, Philadelphia: W.B. Saunders, 232 pages, 1981.
3. Hargens AR. Tissue Nutrition and Viability, New York: Springer-Verlag, 312 pages, 1986.
4. Staub NC, JC Hogg and AR Hargens. Interstitial-Lymphatic Liquid and Solute Movement. Basel, Switzerland: S. Karger, 290 pages, 1987.
5. Wood SC, RE Weber, AR Hargens and RW Millard. Physiological Adaptations in Vertebrates. New York: Marcel Dekker, 450 pages, 1992.
6. Gunji A, F Bonde-Peterson, H Fukuoka, AR Hargens, Y Haruna, K Kawakubo, Y Suzuki and K Takenaka. Inactivity and Health: Effects of Bedrest on Health, Oxford: Blackwell, Acta Physiologica Scandinavica 150, Suppl. 616, 114 pages, 1994.
7. Hargens A, N Takeda and PK Singal. Adaptation Biology and Medicine, Volume 4 Current Concepts, New Delhi, India: Narosa Publishing House, 342 pages, 2005.
8. Maikala RV and AR Hargens. Application of Near-Infrared Spectroscopy (NIRS) in Ergonomics and Exercise. International Journal of Industrial Ergonomics 40 (2), pages 123-229, 2010.
9. Popescu LM, AR Hargens and PK Singal. Adaptation Biology and Medicine, Volume 7 New Challenges, New Delhi, India: Narosa Publishing House, 498 pages, 2014.

Articles:

1. Leete E and AR Hargens. The photochemical fragmentation of N-chloroconine. *Tetrahedron Letters* 40:4901-4904, 1966.
2. Scholander PF, AR Hargens and SL Miller. Negative pressure in the interstitial fluid of animals. *Science* 161:321-328, 1968.
3. Hargens AR and PF Scholander. Stretch mounting for osmotic membranes. *Microvascular Research* 1:417-419, 1969.
4. Hargens AR. Macromolecular osmotic pressures and interstitial fluid pressures in marine multicellular systems. Ph.D. dissertation, University of California, San Diego, 1971.
5. Hargens AR. Freezing resistance in polar fishes. *Science* 176:184-186, 1972.
6. Hargens AR and SV Shabica. Protection against lethal freezing temperatures by mucus in an Antarctic limpet. *Cryobiology* 10:331-337, 1973.
7. Hargens AR, RW Millard and K Johansen. High capillary permeability in fishes. *Comparative Biochemistry and Physiology* 48A:675-680, 1974.
8. Hargens AR and K Johansen. P.F. Scholander-pioneering to a broader sense of biology. *Physiologist* 18:529-532, 1975.
9. Hargens AR and M Perez. Edema in spawning salmon. *Journal of the Fisheries Research Board of Canada* 32:2538-2541, 1975.
10. Hargens AR and BW Zweifach. Transport between blood and peripheral lymph in intestine. *Microvascular Research* 11:89-101, 1976.
11. Mubarak SJ, AR Hargens, CA Owen, LP Garetto and WH Akeson. The wick catheter technique for measurement of intramuscular pressure: a new research and clinical tool. *Journal of Bone and Joint Surgery* 58A:1016-1020, 1976.
12. Hargens AR. Pressure-volume relationships in dehydrating animal tissues. *Comparative Biochemistry and Physiology* 56A:363-367, 1977.
13. Hargens AR and BW Zweifach. Contractile stimuli in collecting lymph vessels. *American Journal of Physiology* 233:H57-H65, 1977.
14. Hargens AR, WH Akeson, SJ Mubarak, CA Owen and LP Garetto. Tissue fluid states in compartment syndromes. In: *Recent Advances in Basic Microcirculatory Research, Bibliotheca Anatomica* 15:108-111, 1977.
15. Zweifach BW, AR Hargens and HH Lipowsky. Factors influencing fluid movement between blood and terminal lymphatics. In: *Recent Advances in Basic Microcirculatory Research, Bibliotheca Anatomica* 15:499-503, 1977.
16. Hargens AR, BJ Tucker and RC Blantz. Renal lymph protein in the rat. *American Journal of Physiology* 233:F269-F273, 1977.

17. Hargens AR, SJ Mubarak, CA Owen, LP Garetto and WH Akeson. Interstitial fluid pressure in muscle and compartment syndromes in man. *Microvascular Research* 14:1-10, 1977.
18. Hargens AR, PF Scholander and WL Orris. Positive tissue fluid pressure in the feet of Antarctic birds. *Microvascular Research* 15:239-244, 1978.
19. Owen CA, PR Woody, SJ Mubarak, and AR Hargens. Gluteal compartment syndromes: A report of three cases and management utilizing the wick catheter. *Clinical Orthopaedics and Related Research* 132:57-60, 1978.
20. Mubarak SJ, AR Hargens, CA Owen and WH Akeson. Muscle pressure measurement with the wick catheter. In: *Practice of Surgery*, edited by HS Goldsmith. Hagerstown, MD.: Harper and Row, Chapter 20N, Laboratory Diagnosis of Orthopaedic Diseases, pp. 1-8, 1978.
21. Hargens AR, WH Akeson, SJ Mubarak, CA Owen, KL Evans, LP Garetto, MR Gonsalves and DA Schmidt. Fluid balance within canine anterolateral compartments and its relationship to compartment syndromes. *Journal of Bone and Joint Surgery* 60A:499-505, 1978.
22. Mubarak SJ, CA Owen, AR Hargens, LP Garetto and WH Akeson. Acute compartment syndromes: diagnosis and treatment with the aid of the wick catheter. *Journal of Bone and Joint Surgery* 60A:1091-1095, 1978.
23. Mubarak SJ, CA Owen, S Garfin and AR Hargens. Acute exceptional superficial posterior compartment syndrome. *American Journal of Sports Medicine* 6:287-290, 1978.
24. Gelberman RH, GS Zakaib, SJ Mubarak, AR Hargens and WH Akeson. Decompression of forearm compartment syndromes. *Clinical Orthopaedics and Related Research* 134:225-229, 1978.
25. Hargens AR, SJ Mubarak, CA Owen, LP Garetto and WH Akeson. Interstitial fluid pressure in muscle and compartment syndromes in man. 1978 Year Book of Orthopaedics and Traumatic Surgery, pp. 386-388, 1978.
26. Hargens AR, JS Romine, JC Sipe, KL Evans, SJ Mubarak and WH Akeson. Peripheral nerve-conduction block by high muscle-compartment pressure. *Journal of Bone and Joint Surgery* 61A:192-200, 1979.
27. Owen CA, SJ Mubarak, AR Hargens, L Rutherford, LP Garetto and WH Akeson. Intramuscular pressure with limb compression. Clarification of the pathogenesis of the drug-induced muscle-compartment syndrome. *New England Journal of Medicine* 300:1169-1172, 1979.
28. Garfin SR, RR Castilonia, SJ Mubarak, AR Hargens, WH Akeson and FE Russell. Role of surgical decompression in treatment of rattlesnake bites. *Surgical Forum* 30:502-504, 1979.
29. Owen CA, SJ Mubarak, AR Hargens, L Rutherford, LP Garetto and WH Akeson. Tissue-pressure determination. *New England Journal of Medicine* 301:663-664, 1979.
30. Menninger FJ III, ER Rosenkranz, JR Utley, WP Dembitsky, AR Hargens and RM Peters. Interstitial hydrostatic pressures in patients undergoing CABG and valve replacement. *Journal of Thoracic and Cardiovascular Surgery* 79:181-187, 1980.

31. Hargens AR, LJ Bowie, D Lent, S Carreathers, RM Peters, HT Hammel and PF Scholander. Sickle-cell hemoglobin: fall in osmotic pressure upon deoxygenation. *Proceedings of the National Academy of Science, USA* 77:4310-4312, 1980.
32. Garfin SR, SA Pye, AR Hargens and WH Akeson. Surface pressure distribution of the human body in the recumbent position. *Archives of Physical Medicine and Rehabilitation* 61:409-413, 1980.
33. Mubarak SJ and AR Hargens. Compartment syndromes of the leg. *Western Journal of Medicine* 133:429-430, 1980.
34. Zweifach SS, AR Hargens, KL Evans, RK Smith, SJ Mubarak and WH Akeson. Skeletal muscle necrosis in pressurized compartments associated with hemorrhagic hypotension. *Journal of Trauma* 20:941-947, 1980.
35. Rosenkranz ER, JR Utley, FJ Menninger III, WP Dembitsky, AR Hargens and RM Peters. Interstitial fluid pressure changes during cardiopulmonary bypass. *Annals of Thoracic Surgery* 30:536-542, 1980.
36. Gelberman RH, PT Hergenroeder, AR Hargens, GN Lundborg and WH Akeson. The carpal tunnel syndrome: a study of carpal canal pressures. *Journal of Bone and Joint Surgery* 63A:380-383, 1981.
37. Garfin SR, SJ Mubarak, KL Evans, AR Hargens and WH Akeson. Quantification of intracompartmental pressure and volume under plaster casts. *Journal of Bone and Joint Surgery* 63A:449-453, 1981.
38. Hargens AR, DA Schmidt, KL Evans, MR Gonsalves, JB Cologne, SR Garfin, PL Hagan and WH Akeson. Quantification of skeletal-muscle necrosis in a model compartment syndrome. *Journal of Bone and Joint Surgery* 63A:631-636, 1981.
39. Hargens AR, MA Gomez, KL Evans, CM Tipton and WH Akeson. Correlation of interstitial fluid pressure and contraction force in canine skeletal muscle. *Recent Advances in Microcirculatory Research, Bibliotheca Anatomica* 20:260-262, 1981.
40. Hargens AR, SR Garfin, SJ Mubarak, RR Castilonia and FE Russell. Edema associated with venomous snake bites. *Recent Advances in Microcirculatory Research, Bibliotheca Anatomica* 20:267-268, 1981.
41. Hargens AR and RW Millard. Starling pressures and fluid homeostasis in the green sea turtle. *Recent Advances in Microcirculatory Research, Bibliotheca Anatomica* 20:390-312, 1981.
42. Hargens AR, DH Gershuni, RN Gould, RH Gelberman, SS Zweifach, SJ Mubarak and WH Akeson. Tissue necrosis associated with tourniquet ischemia. *Recent Advances in Microcirculatory Research, Bibliotheca Anatomica* 20:599-601, 1981.
43. Garfin SR, CM Tipton, SJ Mubarak, SL-Y Woo, AR Hargens and WH Akeson. Role of fascia in maintenance of muscle tension and pressure. *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* 51:317-320, 1981.

44. Hargens AR, JB Cologne, FJ Menninger, JS Hogan, BJ Tucker and RM Peters. Normal transcapillary pressures in human skeletal muscle and subcutaneous tissues. *Microvascular Research* 22:177-189, 1981.
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