

## *CURRICULUM VITAE*

RICHARD L. LIEBER

### **CURRENT POSITIONS:**

*Chief Scientific Officer*

Shirley Ryan AbilityLab (formerly the Rehabilitation Institute of Chicago)

355 East Erie Street

Chicago, IL 60611

Phone: 312-238-6260

[rlieber@sralab.org](mailto:rlieber@sralab.org)

*Professor*

Departments of Physiology, Biomedical Engineering and Physical Medicine and  
Rehabilitation

Northwestern University

Chicago, IL 60611

[richard.lieber@northwestern.edu](mailto:richard.lieber@northwestern.edu)

*Senior Research Career Scientist*

Edward Hines Jr. Veterans Administration Hospital

5000 S 5th Ave, Hines, IL 6014

[Richard.Lieber@va.gov](mailto:Richard.Lieber@va.gov)

### **HOME ADDRESS:**

415 E. North Water Street, #2604

Chicago, IL 60611

### **EDUCATION**

December 2013, Master of Business Administration (M.B.A.)

Rady School of Management

University of California, San Diego.

March 1983, Ph.D. (Biophysics, Electrical Engineering minor)

Department of Zoology

University of California, Davis

June 1978, B.S. Physiology

University of California, Davis

### **MEMBERSHIPS:**

American Academy for Cerebral Palsy and Developmental Medicine

American College of Sports Medicine (Fellow)

American Physical Therapy Association (Honorary Member)  
American Physiological Society  
American Society of Biomechanics (Fellow)  
Biophysical Society  
Fulbright Association (Life Member)  
Institute of Electrical and Electronic Engineers (IEEE)  
Society for Neuroscience  
Western Orthopaedic Association (Honorary Member)

## **GRANT SUPPORT:**

### CURRENT SUPPORT:

“INTRAOPERATIVE OPTIMIZATION AND VALIDATION OF MUSCULOSKELETAL RECONSTRUCTION”  
Veterans Administration, Rehabilitation Engineering Research and  
Development.

Role: Principal Investigator.

Award Amount: \$1,100,000. Award Number: RX002462.

Award Duration: January 1, 2018-December 30, 2021.

“BREAKTHROUGH TECHNOLOGY TO MEASURE HUMAN MUSCLE FUNCTION”

Dr. Ralph and Marian Falk Medical Research Trust.

Role: Principal Investigator.

Award Amount: \$300,000.

Award Duration: Feb 2017-August 2018.

“OPTICAL FREQUENCY COMB NEUROCONTROLLER”

Defense Advanced Research Projects Agency, Biological Technologies Office.

Role: Principal Investigator

Award Amount: \$1,100,000.

Award Duration: July 2016-June 2018.

“SENIOR RESEARCH CAREER SCIENTIST”

Department of Veterans Affairs, Rehabilitation Research & Development.

Role: Principal Investigator

Award Amount: \$646,100.

Award Duration: July 2012-June 2019.

“REHABILITATION INSTITUTE OF CHICAGO—CRAIG H. NEILSEN FOUNDATION SPINAL CORD  
INJURY INFRASTRUCTURE CENTER”

Craig F. Neilsen Foundation

Role: Principal Investigator

Application ID Number: RIC 2015-2019. Award Amount: \$1,000,000.

Award Duration: January 2016-December 2021.

“FUNCTIONAL COMPARISON BETWEEN NERVE AND TENDON TRANSFER AFTER SCI”

Craig F. Neilsen Foundation  
Role: Principal Investigator  
Award Number: 339539. Award Amount: \$600,000.  
Award Duration: September 2015-August 2018.

“MUSCLE METABOLISM AND MECHANICAL EFFICIENCY IN CEREBRAL PALSY”  
National Institute of Child Health and Development.  
Role: Principal Investigator.  
Award Number: R03 HD086585. Award Amount: \$100,000.  
Award Duration: September 2015-August 2017.

“NORTHWESTERN UNIVERSITY CLINICAL AND TRANSLATIONAL SCIENCE INSTITUTE (NUCATS)”  
National Center for Advancing Translational Sciences.  
Role: Associate Director of NUCATS for Rehabilitation Medicine (P.I. D. Lloyd-Jones)  
Award Number: 1UL1TR001422. Award Amount: \$3,670,755.  
Award Duration: August 2015-March 2019.

“THE PHYSIOLOGICAL BASIS OF ROTATOR CUFF MUSCLE REHABILITATION”  
National Institute of Child Health and Development.  
Role: Co-Investigator (P.I. S. Ward)  
Award Number: R01 HD073180. Award Amount: \$1,104,200.  
Award Duration: July 2013-June 2018.

[PREVIOUS SUPPORT:](#)

“PREDOCTORAL TRAINING IN TRANSLATIONAL MUSCULOSKELETAL RESEARCH”  
National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Principal Investigator (Co-P.I. Robert Sah)  
Award Number: T32 AR060712. Award Amount: \$741,250.  
Award Duration: May 2012-August 2017.

“MECHANICAL BASIS FOR TENSIONING TENDON TRANSFERS”  
Veterans Administration, Rehabilitation Engineering Research and  
Development (RX000670)  
Role: Principal Investigator.  
Award Amount: \$997,153. Award Number: HR0011-16-2-0025.  
Award Duration: April 2016-March 2017.

“SAN DIEGO SKELETAL MUSCLE RESEARCH CENTER”  
National Institute of Child Health and Development.  
Role: Principal Investigator.  
Award Number: P30 AR061303. Award Amount: \$2,814,050.  
Award Duration: September 2011-August 2016.

“MICROSENSOR FOR INTRAMUSCULAR PRESSURE MEASUREMENT”  
National Institute of Arthritis and Musculoskeletal and Skin Disease.

Role: Co- Investigator (P.I. Kenton Kaufman, Mayo Clinic)  
Award Amount: \$487,874.  
Award Duration: July 2011-June 2016.

“NATIONAL CENTER FOR SKELETAL MUSCLE REHABILITATION RESEARCH”  
National Institute of Child Health and Development.  
Role: Principal Investigator.  
Award Number: R24 HD050837. Award Amount: \$2,834,955.  
Award Duration: September 2010-August 2015.

“ROLES OF NUCLEOCYTOSKELETAL LINK PROTEINS IN STRIATED MUSCLE”  
National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Co-Investigator (P.I. Ju Chen)  
Award Number: R01 AR059334. Award Amount: \$1,250,000.  
Award Duration: July 2010-June 2015.

“MUSCLE BIOLOGICAL AND BIOMECHANICAL RESPONSE IN CEREBRAL PALSY”  
National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Principal Investigator  
Award Number: R01 AR057393. Award Amount: \$1,250,000.  
Award Duration: July 2010-June 2016.

“MUSCLE STRUCTURE, TOXIN DOSE, AND EXERCISE AFFECT BOTULINUM TOXIN EFFICIENCY”  
National Institute of Child Health and Development.  
Role: Co-Investigator (P.I.: Sam Ward)  
Award Number: R01 AR057013. Award Amount: \$1,111,222.  
Award Duration: July 2009-June 2015.

“ARCHITECTURAL DESIGN OF THE PELVIC FLOOR SKELETAL MUSCLES”  
National Institute of Child Health and Development.  
Role: Co-Investigator (P.I. M. Alperin)  
Award Number: R03 HD075994. Award Amount: \$100,000.  
Award Duration: April 2013-March 2015.

“SKELETAL MUSCLE RESPONSE TO BOTULINUM TOXIN”  
Allergan, Inc.  
Role: Principal Investigator.  
Award Amount: \$253,500.  
Award Duration: December 2009-December 2012.

“THE ROLE OF FHL1 IN EMERY-DREIFUSS AND REDUCING BODY MYOPATHIES”  
National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Co- Investigator (P.I. Ju Chen)  
Award Amount: \$275,000.  
Award Duration: July 2011-December 2013.

“SENIOR RESEARCH CAREER SCIENTIST”

Department of Veterans Affairs, Rehabilitation Research & Development.

Role: Principal Investigator

Award Amount: \$645,000.

Award Duration: April 2005-June 2012.

“MECHANICAL BASIS FOR SURGICAL TRANSFER OF FOREARM MUSCLES”

Veterans Administration, Rehabilitation Engineering Research and Development.

Role: Principal Investigator.

Award Amount: \$703,500.

Award Duration: October 2008-September 2011.

“NATIONAL CENTER FOR SKELETAL MUSCLE REHABILITATION RESEARCH”

National Institute of Child Health and Development.

Role: Principal Investigator.

Award Number: R24 HD050837. Award Amount: \$2,075,000.

Award Duration: September 2005-August 2010.

“WORKSHOP ON MULTI-SCALE MUSCLE MECHANICS”

National Institute of Arthritis and Musculoskeletal and Skin Disease.

Role: Co- Investigator (P.I.: Bruce Damon, Vanderbilt University)

Award Number: R13 AR057641. Award Amount: \$20,600.

Award Duration: July 2009-June 2010.

“DIRECT DETERMINATION OF LOWER EXTREMITY MUSCLE DESIGN”

National Institute of Child Health and Development.

Role: Principal Investigator.

Award Number: R01 HD048501. Award Amount: \$1,150,760.

Award Duration: July 2005-June 2010.

“MICROSENSOR FOR INTRAMUSCULAR PRESSURE MEASUREMENT”

National Institute of Arthritis and Musculoskeletal and Skin Disease.

Role: Co- Investigator (P.I. Kenton Kaufman, Ph.D., Mayo Clinic)

Award Amount: \$618,420

Award Duration: July 2004-June 2009.

“MUSCLE INJURY: MECHANISM, PREVENTION & TREATMENT”

National Institute of Arthritis and Musculoskeletal and Skin Disease.

Role: Principal Investigator.

Award Number: R01 AR40050. Award Amount: \$1,375,000.

Award Duration: July 2003-June 2009.

“VASTUS LATERALIS MUSCLE ADAPTATION DURING LIMB LENGTHENING”

Orthopaedic Research and Education Foundation.

Role: Co-Investigator (P.I. Jennette L. Boakes)

Award Number: 2425. Award Amount: \$92,832.  
Award Duration: July 2004-June 2006.

“STRUCTURE-FUNCTION RELATIONSHIPS IN MUSCLE CONTRACTURE”

National Institute of Child Health and Development.  
Role: Principal Investigator.  
Award Number: R21 HD44822. Award Amount: \$225,000.  
Award Duration: July 2003-June 2007.

“STRUCTURE-FUNCTION RELATIONSHIPS IN MUSCLE FROM PATIENTS WITH CEREBRAL PALSY”

United Cerebral Palsy Foundation.  
Role: Principal Investigator.  
Award Amount: \$100,000.  
Award Duration: July 2003-June 2005.

“MECHANICAL AND BIOLOGICAL BASIS OF SKELETAL MUSCLE STRENGTHENING”

Veterans Administration, Medical Research Service.  
Role: Principal Investigator.  
Award Amount: \$527,000.  
Award Duration: October 2002-September 2007.

“MECHANICAL BASIS FOR SURGICAL TRANSFER OF FOREARM MUSCLES”

Veterans Administration, Rehabilitation Engineering Research and Development.  
Role: Principal Investigator.  
Award Amount: \$785,400.  
Award Duration: January 2002-December 2004.

“REHABILITATION RESEARCH CAREER SCIENTIST AWARD”

Department of Veterans Affairs, Rehabilitation Engineering Research & Development  
Award Amount: \$410,000.  
Award Duration: April 2000-March 2005.

“INTRAOPERATIVE MEASUREMENT IN CEREBRAL PALSY SURGERY”

National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Principal Investigator  
Award Number: R01 AR045358. Award Amount: \$707,558  
Award Duration: April 1999-March 2005.

“STRUCTURE AND FUNCTION OF MYOSIN IN FROG SKELETAL MUSCLE”

National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Co-Investigator  
Award Amount: \$574,498  
Award Duration: April 1999-March 2002.

“CHARACTERIZATION OF MECHANICAL-BASED INJURY IN SKELETAL MUSCLE”

National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Co-Investigator  
Award Amount: \$511,718  
Award Duration: December 1999-November 2002.

“MECHANICAL BASIS FOR SURGICAL TRANSFER OF FOREARM MUSCLES”  
Veterans Administration, Rehabilitation Engineering Research and  
Development (merit review).  
Role: Principal Investigator.  
Award Amount: \$641,300.  
Award Duration: October 1998-December 2001.

“MICROSENSOR FOR INTRAMUSCULAR PRESSURE MEASUREMENT”  
National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Co- Investigator (P.I. Kenton Kaufman, Ph.D., Mayo Clinic)  
Award Amount: \$319,258  
Award Duration: July 1998-June 2001.

“MUSCLE INJURY: MECHANISM, PREVENTION & TREATMENT”  
National Institute of Arthritis and Musculoskeletal and Skin Disease.  
Role: Principal Investigator.  
Award Amount: \$631,994  
Award Duration: April 1996-March 2001.

“MECHANICAL BASIS FOR SURGICAL TRANSFER OF FOREARM MUSCLES”  
Veterans Administration, Rehabilitation Engineering Research and  
Development (merit review).  
Role: Principal Investigator.  
Award Amount: \$641,300.  
Award Duration: October 1998-December 2001.

“SCIENCE AND TECHNOLOGY FOUNDATIONS FOR HYBRID MYOSIN-BASED ACTUATORS”  
Defense Advance Research Projects Agency (DARPA)  
Award Amount: \$108,989.  
Award Duration: May 2000-April 2001.

“MUSCLE RESPONSE TO TENOTOMY AND TENDON REPAIR”  
Orthopaedic Research and Education Foundation  
Role: Co- Investigator (Principal Investigator: Reid Abrams)  
Award Amount: \$135,000  
Award Duration: July 1996-June 1998.

“PHYSIOLOGICAL BASIS OF STRENGTH FOLLOWING SURGICAL TENDON TRANSFER”  
Veterans Administration, Rehabilitation Engineering Research and  
Development (merit review).  
Role: Principal Investigator.

Award Amount: \$544,200.

Award Duration: October 1995-September 1998.

“STRUCTURAL AND PHYSIOLOGICAL CHANGES IN SKELETAL MUSCLE AFTER GROWTH HORMONE  
SECRETOGUE THERAPY

Merck Research Laboratories

Role: Principal Investigator.

Award Amount: \$217,376

Award Duration: September 1994-August 1996

“MICROSENSOR FOR INTRAMUSCULAR PRESSURE MEASUREMENT”

National Institute of Child Health and Human Development

Role: Coinvestigator (Principal Investigator: Kenton Kaufman)

Award Number: CD35192. Award Amount: \$160,272.

Award Duration: April 1994-March 1996.

“PHYSIOLOGICAL BASIS OF STRENGTH FOLLOWING SURGICAL TENDON TRANSFER”

Veterans Administration, Rehabilitation Engineering Research and  
Development (merit review).

Role: Principal Investigator.

Award Amount: \$423,000.

Award Duration: October 1993-September 1995.

“TORQUE GENERATION FOLLOWING SURGICAL TENDON TRANSFER”

National Institute of Arthritis and Musculoskeletal and Skin Disease.

Role: Principal Investigator.

Award Number: AR35192. Award Amount: \$384,057.

Award Duration: July 1991-June 1995.

“MUSCLE INJURY: MECHANISM, PREVENTION & TREATMENT”

National Institute of Arthritis and Musculoskeletal and Skin Disease.

Role: Principal Investigator.

Award Number: AR40050. Award Amount: \$690,875.

Award Duration: June 1989-May 1995.

“ELECTRICAL STIMULATION IN MUSCLE REHABILITATION”

National Institute of Arthritis and Musculoskeletal and Skin Disease.

Role: Principal Investigator.

Award Number: AR35192. Award Amount: \$314,845.

Award Duration: July 1986-June 1991.

“MUSCLE FIBER RECRUITMENT AND STRENGTHENING WITH ELECTRICAL STIMULATION”

Veterans Administration, Rehabilitation Engineering Research and  
Development (merit review).

Role: Principal Investigator.

Award amount: \$353,600.



Award duration: October 1990-September 1992.

“IN VIVO SARCOMERE DYNAMICS IN FISH DURING SWIMMING”

Academic Senate, University of California, San Diego.

Award amount: \$4,500.

Award duration: July 1990-June 1991.

“SKELETAL MUSCLE ADAPTATION TO ELECTRICAL STIMULATION”

Veterans Administration, Rehabilitation Engineering Research and Development (merit review).

Role: Principal Investigator.

Award amount: \$152,000.

Award duration: April 1986-September 1989.

“DEVELOPMENT OF A CLOSED-LOOP STIMULATOR FOR STRENGTHENING HUMAN SKELETAL MUSCLE”

Preferred Medical Products, Torrance, CA.

Role: Principal Investigator.

Award amount: \$76,147. Award duration: June 1988-May 1989.

“SKELETAL MUSCLE ADAPTATION TO ELECTRICAL STIMULATION”

Veterans Administration, Rehabilitation Engineering Research and Development (seed grant).

Role: Principal Investigator.

Award amount: \$48,807.

Award duration: April 1985-March 1986.

“THE USE OF NONSTEROIDAL ANTI-INFLAMMATORY DRUGS IN TREATING MUSCLE INJURY”

The Upjohn Company, Kalamazoo, MI.

Role: Principal Investigator.

Award amount: \$2,836.

Award duration: January 1989-December 1990.

“PARALYZED MUSCLE RESPONSE TO ELECTRICAL STIMULATION”

American Wheelchair Veterans, San Diego, CA.

Role: Principal Investigator.

Award amount: \$2,100.

Award duration: February 1988-January 1989.

“SPINAL CORD DURAL LENGTH CHANGES ASSOCIATED WITH PARALYSIS”

Paralyzed Veterans of America, San Diego, CA.

Role: Co-Investigator.

Award amount: \$3,562.

Award duration: February 1988-January 1989.

“MUSCLE REHABILITATION BY STIMULATION”

Academic Senate, University of California, San Diego.  
Award amount: \$4,834.  
Award duration: September 1987-June 1988.

“SPECIFIC TENSION OF ISOLATED SKELETAL MUSCLE FIBERS”  
Academic Senate, University of California, San Diego.  
Award amount: \$8,000.  
Award duration: September 1986-June 1987.

“SKELETAL MUSCLE RECOVERY AFTER IMMOBILIZATION WITH AND WITHOUT ELECTRICAL STIMULATION”  
Mentor Corporation, Minneapolis, MN.  
Role: Principal Investigator.  
Award amount: \$10,000.  
Award duration: July 1983-December 1984.

“SKELETAL MUSCLE FIBER CHANGES FOLLOWING CONTINUOUS PASSIVE MOTION”  
Sutter Biomedical Corporation, San Diego, CA.  
Role: Principal Investigator.  
Award amount \$2,000.  
Award duration: July 1984-June 1985.

### **AWARDS AND HONORS:**

Hay Award in Sport Biomechanics, American Society for Biomechanics, August 2017, Boulder, CO.

Foundation Matrice Award, European Academy for Developmental Medicine, May 2017, Amsterdam, The Netherlands.

Honorary Member, American Physical Therapy Association, February 2015.

Founders Award, American College of Sports Medicine (Southwest Chapter), October 2014, Irvine, CA.

Gayle G. Arnold Award, American Academy of Cerebral Palsy and Developmental Medicine, October 2013, Minneapolis, MN.

Kappa Delta Award, American Academy of Orthopaedic Surgeons, February 2013, Chicago, IL.

Distinguished Alumnus, University of California, Davis, College of Letters and Sciences, July 2012.

Fellow, American Society for Biomechanics, July 2012.

International Society for the Study of the Lumbar Spine (ISSLS) Research Award,  
Göteborg, Sweden. June 2011.

Giovanni Borelli Award, American Society of Biomechanics, August, 2007.

The Göteborg University Medal, Sahlgrenska University Hospital, June 2007.

Fulbright Scholarship (Sweden), 2007.

Nicolas Andry Award, American Bone and Joint Surgeons, Vancouver, British Columbia,  
Canada, May 2002.

Award of Excellence, International Federation of Societies for Surgery of the Hand,  
Vancouver, British Columbia, Canada, July 1998.

Excellence in Free Paper Presentation, International Federation of Societies for Surgery of  
the Hand, Helsinki, Finland, July 1995.

Fellow, American College of Sports Medicine, March, 1994.

Kappa Delta Young Investigator Award, American Academy of Orthopaedic Surgeons,  
February 1994.

Basic Science Teaching Award (1<sup>st</sup> Annual), Department of Orthopaedics, University of  
California, San Diego, June 1993.

National Institute of Health Predoctoral Fellowship, 1978-1981

Talbot Award, Biophysical Society, February 1981.

Jastro-Shields Graduate Student Award, 1980-1981.

Sigma-Xi Grant-in-aid of Research, 1979-1980.

Graduation with Honors, University of California, Davis, 1978

Life Member, California Scholarship Federation, 1974

California Governor's Scholar, 1974

The Harvard Book, 1973

## **PUBLICATIONS:**

### ***Full Refereed Papers:***

(complete listing at myNCBI: [Lieber myNCBI Link](#))

1. Roos, K.P., R.J. Baskin, R.L. Lieber, J.W. Cline and P.J. Paolini. (1980). Digital data acquisition and analysis of striated muscle diffraction patterns with a direct memory access microprocessor system. Rev. Sci. Inst. 51:762-767. PMID7394463
2. Yeh, Y., R.J. Baskin, R.L. Lieber and K.P. Roos. (1980). Theory of light diffraction by single skeletal muscle fibers. Biophys. J. 29:509-522. PMC1328683
3. Baskin, R.J., R.L. Lieber, T. Oba and Y. Yeh. (1981). Intensity of light diffraction from striated muscle as a function of incident angle. Biophys. J. 36:759-773. PMC1327658
4. Lieber, R.L. and R.J. Baskin. (1981). Direct memory access of diffraction patterns from striated muscle--a software view. Comp. Prog. in Biomed. 2:27-31. PMID7285563
5. Oba, T., R.J. Baskin and R.L. Lieber. (1981). Light diffraction studies of active muscle fibers as a function of sarcomere length. J. Mus. Res. Cell Mot. 2:215-224. PMID 7263856
6. Lieber, R.L. and B.A. Lubell. (1982). Real-time data acquisition of diffraction spectra from contracting skeletal muscle fibers. Proc. Digital Equip. Comp. User's Soc. 9:219-225.
7. Lieber, R.L. and R.J. Baskin. (1983). Intersarcomere dynamics of single skeletal muscle fibers during fixed-end tetani. J. Gen. Physiol. 82:347-364. PMC2228698
8. Lieber, R.L., K.P. Roos, B.A. Lubell, J.W. Cline, and R.J. Baskin. (1983). High speed digital data acquisition of sarcomere lengths from isolated skeletal and cardiac muscle cells. IEEE Trans. Biomed. Eng. 30:50-57 PMID6826186
9. Yeh, Y., M.E. Corcoran, R.J. Baskin, and R.L. Lieber. (1983). Optical depolarization changes on the diffraction pattern in rigor-relaxed transition of skinned muscle fibers. Biophys. J. 44:343-351. PMC1434851
10. Hargens, A.R., W.W. Mortensen, D.H. Gershuni, A.G. Crenshaw, R.L. Lieber and W.H. Akeson. (1984). Long-term measurement of muscle function in the dog hindlimb using a new apparatus. J. Orthop. Res. 1:284-291. PMID6481512
11. Lieber, R.L., R.J. Baskin and Y. Yeh. (1984). Sarcomere length determination using laser diffraction: effect of beam and fiber diameter. Biophys. J. 45:1007-1016. PMC1434983
12. Gershuni, D.H., N.C. Yaru, A.R. Hargens, R.L. Lieber, R.C. O'Hara, and W.H. Akeson. (1984). Ankle and knee position as a modifying intracompartmental pressure in the human leg. J. Bone Joint Surg. 66-A:9:1415-1420. PMID6501337
13. Gershuni, D.H., A.R. Hargens, R.L. Lieber, R.C. O'Hara, C.B. Johansson, and W.H. Akeson. (1985). Decompression of an experimental compartment syndrome with hyaluronidase. Clin. Orthop. Rel. Res. 197:295-300. PMID4017343
14. Lieber, R.L., C.B. Johansson, H.L. Vahlsing, A.R. Hargens, E.R. Feringa. (1986a). Long-term effects of spinal cord transection on fast and slow rat skeletal muscle I. Contractile properties. Exp. Neurol. 91:423-434. PMID2936616

15. Lieber, R.L., J.O. Fridén, A.R. Hargens, E.R. Feringa. (1986b). Long-term effects of spinal cord transection on fast and slow rat skeletal muscle II. Morphometric properties. Exp. Neurol. 91:435-448. PMID2936616
16. Lieber, R.L. D.E. Smith, and A.R. Hargens. (1986c). Real-time acquisition and data analysis of skeletal muscle contraction in a multi-user environment. Comp. Prog. Meth. Biomed. 22:259-265. PMID3637122
17. Amiel, D., M.F. Abel, J.B. Kleiner, R.L. Lieber and W.H. Akeson. (1986). Synovial fluid nutrient delivery in the diarthral joint: An analysis of rabbit knee ligaments. J. Orthop. Res. 4:90-95. PMID3950812
18. Hargens, A.R., A.G. McClure, M.J. Skyhar, R.L. Lieber, D.H. Gershuni, and W.H. Akeson. (1987). Local compression patterns beneath pneumatic tourniquets applied to arms and thighs of human cadavera. J. Orthop. Res. 5:247-252. PMID3572594
19. Bean, D.J., F.R. Convery, S.L-Y. Woo and R.L. Lieber. (1987). Regional variation in shear strength of the bone poly-methylmethacrylate interface. J. Arthroplasty 2:293-298. PMID3430156
20. Lieber, R.L., Fridén, J.O., Hargens, A.R., Danzig, L.A., and D.H. Gershuni. (1988). Differential response of the dog quadriceps muscle to external skeletal fixation of the knee. Muscle & Nerve 11:193-201. PMID3352654
21. Golbranson, F.L., R.W. Wirta, E.J. Kuncir, R.L. Lieber, and C. Oishi. (1988). Volume changes occurring in postoperative below-knee stumps. J. Rehab. Res. Dev. 25:11-18. PMID3361456
22. Lieber, R.L., T.D. Ferro, and A.R. Hargens. (1988). Differential effects of 10 Hz and 50 Hz stimulation of the tibialis anterior on the ipsilateral, unstimulated soleus muscle. Exp. Neurol. 100:426-435. PMID3360078
23. Lieber, R.L. and J.L. Boakes. (1988). Sarcomere length and joint kinematics during torque production in the frog hindlimb. Am. J. Physiol. 254:C759-C768. PMID3259840
24. Lieber, R.L. and J.L. Boakes. (1988). Muscle force and moment arm contributions to torque production in the frog hindlimb. Am. J. Physiol. 254:C769-C772. PMID3259841
25. Lieber, R.L. and J. Fridén. (1988). Selective damage of fast glycolytic muscle fibers with eccentric contraction of the rabbit tibialis anterior. Acta Physiol. Scand. 133:587-588. PMID3227940
26. Frank, C., D. McDonald, R. Lieber, and P. Sabiston. (1988). Biochemical heterogeneity within the maturing rabbit medial collateral ligament. Clin. Orthop. Rel. Res. 236:279-286. PMID3180581
27. Lieber, R.L. and F.T. Blevins. (1989). Skeletal muscle architecture of the rabbit hindlimb: Functional implications of muscle design. J. Morphol. 199:93-101. PMID2921772

28. Lieber, R.L., T. McKee-Woodburn, J. Fridén, and D.H. Gershuni. (1989). Recovery of the dog quadriceps after ten weeks of immobilization followed by four weeks of remobilization. J. Orthop. Res. 7:408-412. PMID2703932
29. Wenger, D.R., D. Maulden, G. Speck, D. Morgan, and R.L. Lieber, (1989). Corrective shoes and inserts as treatment for flexible flat foot in infants and children. J. Bone Joint. Surg. 71:800-810. PMID2663868
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7. Lieber, R.L. (1990). Invited opinion: Statistical significance and statistical power in hypothesis testing. J. Orthop. Res. 8:304-309. PMID2303964

8. Lieber, R.L. (1990). Hypothesis: Biarticular muscles transfer moments between joints. Dev. Med. Child Neurol. 32:456-458. PMID2354757
9. Lieber, R.L. and J. Fridén. (1991). Skeletal muscle and tendon microanatomy. Current Opinion in Orthopaedics 2:691-695.
10. Fridén, J. and R.L. Lieber (1992). The structural and mechanical basis of exercise-induced muscle injury Med. Sci. Sport Exerc. 24:521-530. PMID1569848
11. Lieber, R.L. (1993). Skeletal muscle architecture: implications for muscle function and surgical tendon transfer. J. Hand Therapy 6:105-113. PMID8343877
12. Lieber, R.L. and S.C. Bodine-Fowler. (1993). Skeletal muscle mechanics: Implications for rehabilitation. Physical Therapy 73:844-856. PMID8248293
13. Lieber, R.L. and J. Fridén. (1993). Mechanism of muscle injury due to intense exercise. Current Opinion in Orthopaedics 4:80-84.
14. Lieber, R.L. and J. Fridén. (1994). Biomechanical basis of muscle cellular damage. Basic and Applied Myology 4:25-34.
15. Fridén, J and R.L. Lieber (1994). Structural basis of muscle cellular damage. Basic and Applied Myology 4:35-42.
16. Patel, T.J. and R.L. Lieber. (1997). Force transmission in skeletal muscle: from actomyosin to external tendons. Exercise and Sport Science Reviews 25:321-363. PMID9213097
17. Lieber, R.L. and J. Fridén. (1998). Musculoskeletal balance of the human wrist elucidated using intraoperative laser diffraction. J. Electromyog. Kinesiol. 8:93-100. PMID9680949
18. Lutz, G.J. and R.L. Lieber (1999). Skeletal muscle myosin II structure and function. Exercise and Sport Science Reviews 27:63-77. PMID10791014
19. Jamali, A.A., Afshar, P., Abrams, R.A. and R.L. Lieber. (2000). Skeletal muscle response to tenotomy. Muscle & Nerve 23:851-862. PMID10842260
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22. Lieber, R.L. and J. Fridén. (2001). Clinical significance of skeletal muscle architecture. Clin. Orthop. Rel. Res. 143:140-151. PMID11210948
23. Burkholder, T.J. and R.L. Lieber. (2001). Sarcomere length operating range of muscles during movement. J. Exp. Biol. 204:1529-1536. PMID11296141
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35. Lieber, R.L. and S.R. Ward. (2011). Skeletal muscle design strategies for controlling movement. Phil. Trans. B. 366:1466-1476.
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45. Lieber, R.L. T. Roberts, S. Blemker, S. Lee and W. Herzog. (2017) Skeletal muscle mechanics, energetics and plasticity. J. Neuroeng. Rehabil. 4:108. PMID: 29058612
46. Lieber, R.L. Biomechanical response of skeletal muscle to eccentric contraction. (2018). J. Sport Health Sci. (in press).
47. Lieber, R.L. and J. Fridén. (2018). Muscle contracture in cerebral palsy and tetraplegia. J. Appl. Physiol. (submitted).

### ***Books and Book Chapters:***

1. Lieber, R.L. (1990). Experimental design and statistical analysis. Chapter 30. In: Knee Ligaments: Structure, Function, Injury and Repair. (Ed: D. Daniel, W. Akeson and J. O'Connor) Raven Press, San Diego, CA, pp. 535-542.
2. Lieber, R.L. (1992). Neuromuscular physiology, function, and plasticity. In: Orthopaedic Rehabilitation. (Ed: V.L. Nickel and M.J. Botte), Churchill Livingstone, New York, NY. Chapter 24, pp. 259-276.
3. Lieber, R.L. (1992). Skeletal Muscle Structure and Function: Implications for Physical Therapy and Sports Medicine. Williams and Wilkins, Baltimore, MD.
4. Lieber, R.L. and J. Fridén. (1993). Neuromuscular stabilization of the shoulder girdle, in The Shoulder: A balance of mobility and stability. Chapter 4, pages 91-106. (Edited by F.A. Matsen, F.H. Fu, R.J. Hawkins). American Academy of Orthopaedic Surgeons, Rosemont, IL.

5. Bodine, S. and R.L. Lieber. (1994). Peripheral nerve physiology, anatomy and pathology. Orthopaedic Basic Science, American Academy of Orthopaedic Surgeons, Chicago, IL, Chapter 8, pp. 325-396.
6. Lieber, R.L. (1994). Experimental design and statistical analysis. Orthopaedic Basic Science, American Academy of Orthopaedic Surgeons, Chicago, IL Chapter 13, pp. 623-665.
7. Lieber, R.L. and T.J. Burkholder. (1995). Musculoskeletal Soft Tissue Mechanics, in CRC Handbook of Biomedical Engineering, (Ed: J. Bronzino). CRC Press, Inc., Boca Raton, FL, pp. 352-256.
8. Lieber, R.L. and J. Fridén. (1995). Skeletal muscle metabolism, fatigue and injury, in Repetitive Motion Disorders of the Upper Extremity (Edited by S. Gordon, S. Blair and L. Fine). American Academy of Orthopaedic Surgeons, Rosemont, IL. Chapter 19, pp.287-300.
9. Fridén, J. and Lieber, R.L. (1995). Biomechanical injury to skeletal muscle from repetitive loading: eccentric contractions and vibration, in Repetitive Motion Disorders of the Upper Extremity (Edited by S. Gordon, S. Blair and L. Fine). American Academy of Orthopaedic Surgeons, Rosemont, IL. Chapter 20, pp.301-312.
10. Ryan, A.F., L. Lin, R.L. Lieber, N.K. Woolf and G.A. Axelsson. (1996). Role of the middle ear muscles in acoustic conditioning: Physiological and molecular studies, in Auditory System Plasticity and Regeneration (Edited by R.J. Salvi, F. Fiorino, D. Henderson and V. Colletti). Thieme Medical Publishers, Inc. New York, NY, pp. 155-164.
11. Fridén, J. and R.L. Lieber. (1996). Muscle architectural basis for neuromuscular control of the forearm and hand, in Hand and Brain (Edited by P. Haggard, R. Flanagan and A. Wing), Academic Press, Inc., Orlando, FL, pp. 69-79.
12. Lieber, R.L. (1996). Skeletal muscle pathophysiology in low back pain, in Low Back Pain: A Scientific and Clinical Overview (Edited by J.N. Weinstein and S. L. Gordon). American Academy of Orthopaedic Surgeons, Rosemont, IL, pp.347-366.
13. Lieber, R.L. and J. Fridén. (1997). Clinical use of sarcomere length to gauge tension of tendon transfers, in Current Practice in Hand Surgery (Edited by P. Saffar, G. Foucher and M. Dunitz). Martin Dunitz, London, England, pp. 59-64.
14. Fridén, J. and R.L. Lieber. (1997). Muscle damage induced by cyclic eccentric contraction: biomechanical and structural studies. in Muscle Damage (Edited by S. Salmons), Oxford University Press, Oxford, England, pp. 41-63.
15. Lieber, R.L. and J. Fridén. (2000). Intraoperative sarcomere length measurements reveal musculoskeletal design principles, in Biomechanics and Neural Control of Posture and Movement (Ed: Winters and Crago), pp. 58-73.
16. Lieber, R.L. (2000). Skeletal muscle anatomy and physiology, in Principles & Practice of Orthopaedic Sports Medicine (Ed: W.E. Garrett, Jr., K.P. Speer, and D.T. Kirkendall), Lippincott Williams & Williams, pp. 3-19.

17. Lieber, R.L. and T.J. Burkholder. (2000). Musculoskeletal Soft Tissue Mechanics, in CRC Handbook of Biomedical Engineering, 2<sup>nd</sup> Edition (Ed: J.D. Bronzino), Section III, Chapter 22, pp. 22-1 to 22-8. CRC Press, Inc., Boca Raton, FL.
18. Lieber, R.L. (2002). Skeletal Muscle Structure, Function and Plasticity, 2<sup>nd</sup> Edition. Lippincott Williams & Wilkins, Baltimore, MD. 389 pages.
19. Fridén J., R.L. Lieber, M. Hargreaves and A. Urhausen. (2003). Recovery after training—inflammation, metabolism, tissue repair and overtraining, in Textbook of Sports Medicine. (Edited by: M. Kjaer, M. Krogsgaard, P. Magnusson, L. Engebretsen, H. Roos, T. Takala, and S. Woo). Blackwell Publishing, New York, pp. 189-200.
20. Lieber, R.L. and T.J. Burkholder. (2003). Chapter 5, Musculoskeletal soft tissue mechanics, in Biomechanics: Principles and Applications, (Eds: D.J. Schneck and J.D. Bronzino). CRC Press, Inc., Boca Raton, FL, pp. 99-106.
21. Lieber, R.L. (2004). Estructura del músculo esquelético, función y plastidad. McGraw-Hill-Interamericana., Madrid, Spain, 364 pages.
22. Lieber, R.L. (2005). Muscle architectural and biomechanical considerations in tendon transfer, in, Tendon Transfers in Reconstructive Hand Surgery (Ed: Jan Fridén), Taylor-Francis, London, England.
23. Vasavada, S. Delp, and R.L. Lieber. (2006). Architectural design and function of human back muscles, in Rothman-Simeone The Spine, (Chapter 3, 5<sup>th</sup> Edition; Eds: Herkowitz, Garfin, Eismont, Bell, Balderson) pp. 55-70.
24. Lieber, R.L. (2007). Form and Function of Skeletal Muscle. Orthopaedic Basic Science 3<sup>rd</sup> Edition, (Chapter 12, Eds: T.A. Einhorn, R.J. O’Keefe, and J.A. Buckwalter) American Academy of Orthopaedic Surgeons, Chicago, IL pp. 223-244.
25. Lieber, R.L. and S.R. Ward. (2007). Skeletal muscle tissue bioengineering in, bioengineering (Eds: S. Chien, P. Chen and Y.-C. Fung), World Scientific Publishers, New York.
26. Lieber, R.L. (2010). Skeletal Muscle Structure, Function and Plasticity, 3<sup>rd</sup> Edition. Lippincott Williams & Wilkins, Baltimore, MD. 304 pages.
27. Lieber, R. L. and S.R. Ward. (2011). Skeletal muscle design to meet functional demands. Phil. Trans. Roy. Soc. 366:1466-1476.
28. Lieber, R.L. and J. Fridén. (2012). The physiology of tensioning tendon transfers. In *Tendon Transfer Surgery of the Upper Extremity: A Master Skills Publication*. (Eds: A. Van Heest and C. Goldfarb). Chapter 3, pages 23-34.
29. Lieber, R.L. (2013). Skeletal Muscle Structure, Function and Plasticity, 3<sup>rd</sup> Edition (Japanese Translation). Lippincott Williams & Wilkins, Baltimore, MD.
30. Smith, L.R. and R.L. Lieber. (2014). Structure-function relationships in muscle as related to cerebral palsy. In: *Cerebral Palsy* (Ed. R. Shepherd). Chapter 6, pages 135-156.
31. Ward, S.R. and R.L. Lieber. (2017). Shoulder muscle architecture, physiology, and plasticity. In: *Bio-orthopaedics: A New Approach*. Lane and Gobbi (Eds.).

32. Lieber, R.L. (2018). Skeletal Muscle Structure, Function and Plasticity, 4<sup>th</sup> Edition. Self-published, 304 pages.
33. Shahidi, B, J.C. Hubbard, R.L. Lieber and S.R. Ward. (2018). Function of human paraspinal muscles (Chapter 9). ISSLS Lumbar Spine Online Textbook

#### ***Full Papers (submitted):***

1. Winters, T.M., M. Lim, M. Takahashi, J. Fridén, R.L. Lieber and S.R. Ward. (2018). Skeletal muscle force production and excursion are altered by surgical release. J. Appl. Physiol. (submitted).
2. Cheung, W., W. Ding, J.-Y. Zhan, P. Zhou, S. Li, M.C. Esparza, H.M. Hoffman, R.L. Lieber, and R.H. Mak. (2018). Vitamin D repletion ameliorates muscle wasting and fibrosis in mice with chronic kidney disease associated cachexia. J. Am. Soc. Nephrol. (submitted).
3. O'Connor, S.M., K.R. Kaufman, S.R. Ward, and R.L. Lieber. (2018). Intramuscular pressure correlates with muscle tension in rabbit tibialis anterior. J. Appl. Biomech. (submitted).
4. Dayanidhi, S. M.C. Kinney, P.B. Dykstra, J.J. McCarthy, C.A. Peterson, and R.L. Lieber. (2018). Reduced satellite cell number impairs serial sarcomere addition and recovery from skeletal muscle contracture. J. Physiol. (Lond.). (submitted).
5. Smith, J., M. Rafferty, A.W. Heinemann, M.K. Meachum, J.A. Villamar, R.L. Lieber, C.H. Brown. (2018). Evaluation of the factor structure of implementation research measures adapted for a novel context and multiple professional roles. Imp. Sci. (submitted).

#### **POSITIONS HELD:**

Chief Scientific Officer and Senior Vice President, Shirley Ryan AbilityLab (formerly the Rehabilitation Institute of Chicago), 2014-present.

Professor, Northwestern University, (Dept. of Physical Medicine and Rehabilitation, Dept. of Physiology, and Dept. of Biomedical Engineering), 2014-present.

Senior Research Career Scientist, Department of Veterans Affairs (GS-15), April 2005-present.

Co-Director (with R. Sah), Center for Musculoskeletal Research (Institute for Engineering in Medicine at UCSD), 2009-2014.

Director, National Skeletal Muscle Research Center, 2005-2014.

Director, San Diego Skeletal Muscle Research Center, 2009-2014.

Professor, University of California, San Diego, Departments of Orthopaedics and Bioengineering, July 1994-2014.

Associate Professor, University of California, San Diego, Departments of Orthopaedics and AMES/Bioengineering, July 1990- June 1994.

Member, Institute for Biomedical Engineering, 1992-2014.

Member, UCSD Biomedical Sciences Graduate Group, 1990-2014.

Research Career Scientist, Veterans Affairs Medical Center (GS-14), San Diego, Department of Orthopaedic Surgery, April 2000-March 2005.

Biomedical Engineer, GS-13/14, Veterans Administration Medical Center, San Diego, Department of Orthopaedic Research, April 1986-March 2000.

Assistant Professor of Surgery, University of California, San Diego, Department of Surgery, Division of Orthopaedics and Rehabilitation, July 1985-June 1990.

Biomedical Engineer, GS-11, Veterans Administration Medical Center, San Diego, Department of Orthopaedic Research, June 1983-March 1986.

Postgraduate Research Physiologist, University of California, San Diego, Department of Surgery, Division of Orthopaedics and Rehabilitation, September 1982-June 1985.

Research Associate, University of California, Davis, July 1981-August 1982.

## **GRADUATE STUDENT EDUCATION:**

### THESIS COMMITTEES:

Ph.D. Committee for James Munis, "Skeletal muscle atrophy during space flight: the role of the glucocorticoid modulated glutamine transport"\_Biomedical Sciences Graduate Group, Spring 1987.

Ph.D. Committee for Maria Zack, "New approaches to random sampling algorithms" Department of Mathematics, Winter 1988.

Ph.D. Committee for Eileen G. Fowler, "The contribution of individual muscles to the ankle moment produced in the cat hindlimb." Department of Kinesiology, University of California, Los Angeles, Spring, 1990.

Ph.D. Committee for Mike Dray, "Capillary geometry and fiber types in rat skeletal muscle" Biomedical Sciences Graduate Group, Fall 1993.

- Ph.D. Committee for Torre Knowler, “Biomechanics and kinematics of swimming tunas” Scripps Institute of Oceanography, Winter 1994.
- Ph.D. Committee for Sandra van Leuven, “Regional effects of myocardial ischaemia” Division of Bioengineering/Department of Applied Mathematics and Engineering Sciences. University of California, San Diego, Winter 1994.
- Ph.D. Committee for Craig Clark, “Strain rate effects on cell signaling in myoblasts” Department of Bioengineering. University of California, San Diego, Spring 2000.
- Ph.D. Opponent for Trevor Allen, “Effect of contraction on the mechanical properties of skeletal muscle” Department of Physiology. Monash University, Victoria, Australia, Spring 2000.
- Ph.D. Committee for Creed Stary, “Exercise-induced HSP transcription in single skeletal muscle fibers” Biomedical Sciences Graduate Program. University of California, San Diego, Winter 2004-Spring 2006.
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- M.S. Thesis committee member for Jared Tangney, “Effects of Alterations in Sarcomere Structure and Prestretch Timing on Cardiac Muscle Mechanics” Department of Bioengineering. University of California, San Diego, Fall 2010-2012.

#### THESES SUPERVISED:

- M.S. Thesis advisor for Suzanne M. Malloy, “Electrogoniometric measurement of normal arm motion” Division of Bioengineering/Department of Applied Mathematics and Engineering Sciences. University of California, San Diego, Spring 1984.
- M.S. Thesis advisor for M. Jeanne Robison, “Human quadriceps muscle fatigue at three frequencies and two duty cycles using functional electrical stimulation” Department of Physical Education, San Diego State University, 1988-1989.
- M.S. Thesis advisor for Christine L. Trestik, “Relationship between Achilles tendon mechanical properties and gastrocnemius muscle function” Division of Bioengineering/Department of Applied Mathematics and Engineering Sciences. University of California, San Diego, 1990-1991.

- M.S. Thesis advisor for Mary C. Schmitz, “Muscle contractile and morphological properties following noninvasive eccentric exercise” Division of Bioengineering/Department of Applied Mathematics and Engineering Sciences. University of California, San Diego, 1990-1992.
- M.S. Thesis advisor for Michel Sam, “Eccentric contraction-induced muscle injury in desmin knockout mice” Department of Applied Mathematics and Engineering Sciences. University of California, San Diego, 1996-1998.
- Ph.D. Advisor for Taby Ahsan, Division of Bioengineering/Department of Applied Mathematics and Engineering Sciences. University of California, San Diego, 1992-1994.
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- Ph.D. Advisor for Thomas Burkholder, “Sarcomere number adaptation after altered muscle function” Division of Bioengineering/Department of Applied Mathematics and Engineering Sciences. University of California, San Diego, Fall 1992-1997.
- Ph.D. Advisor for Sameer B. Shah, “Sarcomere number adaptation in desmin knockout mice” Department of Bioengineering. University of California, San Diego, Fall 1997-Spring 2002.
- M.S. Thesis advisor for Jennifer Davis, “Intramuscular pressure measurements during active and passive isometric muscle contraction” Department of Physical Education, San Diego State University, 1999-2000.
- Ph.D. Advisor for Ilona Barash, “Structure and function of stress sensing proteins in skeletal muscle” Biomedical Sciences Graduate Group (MSTP Program). University of California, San Diego, Fall 2002-Winter 2005.
- Ph.D. Advisor for Michelle Palmisano, “Confocal imaging and mechanical analysis of transfected skeletal muscle” Department of Bioengineering. University of California, San Diego, Fall 2003-Winter 2007.

- Ph.D. Advisor for David Gokhin, “Development of stress production in skeletal muscle.” Department of Bioengineering. University of California, San Diego, Fall 2005-Spring 2009.
- Ph.D. Advisor for Amanda Felder, “Real-time imaging of cytoskeletal proteins during eccentric contractions in mouse skeletal muscle.” Department of Bioengineering. University of California, San Diego, Fall 2004-2009.
- Ph.D. Advisor for Lucas Smith, “Biological and biomechanical adaptation of muscle to Cerebral Palsy.” Department of Bioengineering. University of California, San Diego, Fall 2007-2011.
- Ph.D. Advisor for Gretchen Meyer, “The role of the desmin intermediate filament system in muscle force transduction and force transmission.” Department of Bioengineering. University of California, San Diego, Fall 2007-2011.
- Ph.D. Advisor for Tim Tirrell, “Intraoperative laser diffraction in hand surgery.” Department of Bioengineering. University of California, San Diego, Fall 2010-2013.
- Ph.D. Advisor for Allison Gillies, “Skeletal muscle extracellular matrix structure, function and plasticity.” Department of Bioengineering. University of California, San Diego, Fall 2010-2013.
- Ph.D. Advisor for Margie Mathewson, “Skeletal muscle plasticity in response to altered neural input.” Department of Bioengineering. University of California, San Diego, Winter 2011-Spring 2014.
- Ph.D. Advisor for Mark Chapman, “Remodeling of skeletal muscle extracellular matrix due to loss of muscle intermediate filament proteins.” Department of Bioengineering. University of California, San Diego, Spring 2011-Summer 2015.
- M.S. Thesis advisor for Rachel Meza, “High Resolution Microscopy of the Muscle Connective Tissue Network from Children with Cerebral Palsy” Department of Biology. University of California, San Diego, 2012-Summer 2015.
- Ph.D. Advisor for Kevin Young, “Laser Interferometry as a Minimally Invasive Method to Measure Sarcomere Length.” Department of Bioengineering. University of California, San Diego, Spring 2012-Spring 2016.

### **POSTDOCTORAL FELLOWS AND VISITING SCHOLARS:**

Field T. Blevins, M.D. (1987-1988)

Michael T. Mai, M.D. (1988-1989)



Sergei Kashin, Ph.D. (1989-1990)

Mark D. Jacobson, M.D. (1990-1992)

Dev K. Mishra, M.D. (1990-1991)

Gregory J. Loren, M.D. (1991-1992)

Scott D. Shoemaker, M.D. (1993-1994)

David J. Pierotti, Ph.D. (1993-1995)

Robert Benz, M.D. (1994-1995)

Randall J. Mohler, M.D. (1994-1995)

Albert Tsai, M.D. (1995-1996)

Amir Jamali, M.D. (1996-1997)

Gary Chleboum, Ph.D., R.P.T. (1996-1997; Ohio University)

Gordon J. Lutz, Ph.D. (1995-1998)

Steve Enguidanos, M.D. (1996-1997)

Yasuo Kawakami, Ph.D. (1998; Tokyo University)

Jan Fridén, M.D., Ph.D. (1998-1999; 2004-2005; Göteborg University)

Phil Yuan, M.D. (1998-1999)

Fong-Chin Su, Ph.D. (1999; National Cheng Kung University, Taiwan)

Michael Burdi, M.D. (1999-2000)

Alison McKenzie, Ph.D., P.T. (2002-2003; Chapman University)

Eric Hentzen, M.D., Ph.D. (2002-2003)

Suzanne Steinmann, M.D. (2003-2004)

Samuel R. Ward, Ph.D., P.T. (2003-2006)

Jared Foran, M.D. (2004-2005)

William Peace, M.D. (2005-2006)

Mitsuhiko Takahashi, M.D., Ph.D. (2005-2008)

Jonah Hulst, M.D. (2006-2007)

Akihito Tomiya, M.D. (2007-2008)

Andrew Indersano, M.D. (2008-2009)

Mathew Shilito, M.D. (2009-2010)

Orrin Franko, M.D. (2010-2011)

Sid Bhola, M.D. (2011-2012)

David Muzykewicz, M.D. (2012-2013)

Sudarshan Dayanidhi, P.T., Ph.D. (2012-2014)

Andrea Domineghetti, Ph.D. (2011-2014)

Matthew Kinney, M.D. (2013-2014)

Ben Binder-McKay, P.T., Ph.D. (2018-present)

#### **PATENTS:**

Lieber, R.L. and R.J. Baskin. (1986). Surgical myometer method. U.S. Patent Number: 4,570,641.

Lieber, R.L. (1989). Adaptive, closed-loop electrical stimulation of muscle. U.S. Patent Number: 4,838,272.

Lieber, R.L. (1996). Method and apparatus for controlling skeletal muscle fatigue during electrical stimulation. Patent Number: 5,507,788.

#### **SELECTED SEMINARS PRESENTED:**

Biophysical Society Meeting, June 1980, New Orleans, LA.

University of California, Davis, Biomedical Engineering Symposium, October 1980, Davis, CA.

Biophysical Society Meeting, February 1981, Denver, CO.

International Society for Heart Research Annual Meeting, June 1981, Burlington, VT.

Stanford University Rehabilitative Engineering Research and Development seminar series. October 1981, Palo Alto, CA.

University of California, San Diego, Applied Mechanics and Engineering Sciences Seminar, February 1982, La Jolla, CA

Rehabilitation Engineering Society of North America, June 1983, San Diego, CA

Biophysical Society Meeting, February 1983, San Diego, CA

Orthopaedic Research Society, February 1984, Atlanta, GA

Biophysical Society Meeting, February 1984, San Antonio, TX

IEEE Frontiers of Engineering in Health Care, Symposia on Neuromuscular Control and Functional Electrical Stimulation. September, 1984, Los Angeles, CA

Orthopaedic Research Society, February 1985, Las Vegas, NV

Biophysical Society, February 1985, San Francisco, CA

University of California, San Diego, Applied Mechanics and Engineering Sciences Seminar, November 1985, La Jolla, CA

Orthopaedic Research Society, January 1987, San Francisco, CA

Western Orthopaedics Meeting, April 1987, San Diego, CA

Sports Medicine Traveling Fellowship Program (jointly sponsored by the American Society for Sports Medicine and the European Society of Knee Surgery and Arthroscopy), June 1987, San Diego, CA.

University of California, San Diego, Applied Mechanics and Engineering Sciences Seminar, October 1987, La Jolla, CA.

University of California, Los Angeles, Department of Kinesiology, Neuromotor Control Seminar, November 1987, Los Angeles, CA.

Orthopaedic Research Society, February 1988, Atlanta, GA

Conference on Neural Prostheses (Engineering Foundation), July 1988, Potosi, MO.

San Diego State University, Department of Physical Education, September, 1988, San Diego, CA.

Orthopaedic Research Society, February 1989, Las Vegas, NV

Biomechanics Research Group, Department of Physical Education, University of Calgary, July 1989, Calgary, Alberta

Musculoskeletal and Joint Diseases Research Group, Department of Surgery, University of Calgary, July 1989, Calgary, Alberta

Biennial Conference on Motor Disturbances, Cumberland College, October 1989, Sydney, Australia,

Society for Neuroscience, October, 1989, Phoenix, AZ

IEEE 37th Conference on Engineering in Medicine and Biology, November, 1989, Seattle, WA.

Marine Bio-Medicine Workshop, Scripps Institute of Oceanography, December 1989, La Jolla, CA.

Orthopaedic Research Society, February 1990, New Orleans, LA.

American Academy of Orthopaedic Surgeons, February 1990, New Orleans, LA.

American Physiological Society, October 1990, Orlando, FL.

Department of Zoology, University of California, Davis, December, 1990.

Department of Developmental and Cell Biology, University of California, Irvine, February, 1990, Irvine, CA.

Orthopaedic Research Society, March 1991, Anaheim, CA.

Department of Physiology, University of Massachusetts, Worcester, MA, June 1991.

Department of Evolutionary and Comparative Biology, Brown University, Providence, RI, June 1991.

Musculoskeletal and Joint Diseases Research Group, Department of Surgery, University of Calgary, Calgary, Alberta, August 1991.

Grand Rounds, Department of Orthopaedics, University of Colorado, Denver, CO, September, 1991.

The Hemiplegic Shoulder: When neurological problems become orthopaedic problems. International Clinical Educators, October, 1991, San Diego, CA

Orthopaedic Research Society, Washington, D.C., February 1992.

Department of Orthopaedics, University of Göteborg, Göteborg, Sweden, March, 1992.

Department of Anatomy, University of Umeå, Umeå, Sweden, April, 1992.

Society for Experimental Biology, Lancaster, England, April, 1992.

Keynote Speaker, 7th International Bobath Symposium, San Francisco, CA, April, 1992.

Department of Functional Anatomy, Faculty of Human Movement Science, Free University, Amsterdam, Holland, September, 1992.

Orthopaedic Research Society, San Francisco, CA, February 1993.

American Academy of Orthopaedic Surgeons, San Francisco, CA, February 1993.

Joint Science Program, Claremont-McKenna College, Claremont, CA, January 1994.

Kappa Delta Award Lecture, Orthopaedic Research Society and American Academy of Orthopaedic Surgeons, New Orleans, LA, February 1994.

Federation of the American Society for Experimental Biology, Anaheim, March 1994.

Horizons in Biomedicine Keynote Speaker, Cleveland Clinic, Cleveland, OH, May 1994.

American College of Sports Medicine, Indianapolis, IN, June 1994.

Second World Congress on Biomechanics, Amsterdam, The Netherlands, July, 1994.

Campbell Clinic, Memphis, TN, August, 1994.

Keynote Speaker, Canadian Society for Biomechanics, Calgary, Canada, August, 1994.

Keynote Speaker, American Society for Biomechanics, Columbus, Ohio, October 1994.

Keynote Speaker, Pacific Northwest Exercise Group, Vancouver, Canada, February, 1995.

Grand Rounds, Division of Orthopaedics Surgery, Ohio State University, Columbus, OH, February 1995.

Orthopaedic Research Society, Orlando, FL, February 1995.

American College of Sports Medicine, Minneapolis, MN, June, 1995.

Department of Hand Surgery, Göteborg University, Sweden, October, 1996.

Orthopaedic Research Society, Atlanta, GA, February 1996.

Departments of Exercise Science and Mechanical Engineering, University of California, Davis, Davis, CA March 1996.

Department of Physiological Sciences, University of California, Los Angeles, CA, April, 1996

American College of Sports Medicine, Cincinnati, OH, May 1996.

Invited Speaker, Engineering Foundation Conference on Motor Control, Sterling, OH, June, 1996.

Invited Speaker, Canadian Society for Biomechanics, Vancouver, Canada, August, 1996.

Invited Speaker, Integrative Biology of Exercise (American Physiological Society), Vancouver, Canada, October, 1996.

Orthopaedic Research Society, San Francisco, CA, February 1997.

Colloquium in Kinesiology, Department of Kinesiology, University of Colorado, Boulder, CO, February 1997.

Distinguished Lecture Series, Hospital for Special Surgery, New York, NY, March 1997.

Invited Speaker, 12th Annual Bobath Symposium, San Francisco, CA, April 1997.

Department of Orthopaedic Surgery Grand Rounds, Emory University, Atlanta, GA, April 1997.

Department of Physiology, Emory University, Atlanta, GA, April 1997.

American College of Sports Medicine, Denver, CO, May 1997.

Orthopaedic Research Society, New Orleans, LA, March 1998.

Keynote Speaker, "Tetraplegia 1998," Cleveland, Ohio, May 1998.

Invited Speaker, "International Federation of Societies for Surgery of the Hand," Vancouver, British Columbia, Canada, May 1998.

American College of Sports Medicine, Seattle, WA, June 1999.

Skeletal Muscle Satellite Symposium (invited speaker), Canmore Alberta, Canada, August, 1999.

International Society for Biomechanics, Calgary, Alberta, Canada, August, 1999.

Division of Physiology/Department of Medicine Seminar, University of California, San Diego School of Medicine, September, 1999.

Museum of Comparative Zoology, Harvard University, Cambridge, MA, November 2000.

Keynote Lecture, American College of Sports Medicine (Southwestern Chapter), San Diego, CA, November 2000.

Department of Kinesiology and Applied Physiology Colloquium, University of Colorado, Boulder, CO, January 2001.

Biophysical Society, Boston, MA, February 2001.

Orthopaedic Research Society, San Francisco, CA , February 2001.

Keynote Lecture, “7<sup>th</sup> International Conference on Tetraplegia Surgery and Rehabilitation,” Bologna, Italy, June 2001.

Grand Rounds, Department of Orthopedics, University of Minnesota, August, 2002.

Musculoskeletal Research Series, Department of Orthopaedics, Case Western Reserve University, and Cleveland Clinic, October 2002.

Musculoskeletal Research Series, Departments of Orthopaedics and Biomedical Engineering, The Cleveland Clinic, October 2002.

Grand Rounds, Department of Orthopaedics, Case Western Reserve University, October 2002.

Invited Lecture, 44<sup>th</sup> Annual Meeting of Society of Military Orthopaedic Surgeons, San Diego, December 2002.

Visiting Professor, Karolinska Institute, Department of Orthopaedic Surgery, February, 2003.

Brain Research Institute, UCLA, Los Angeles, CA, December 2003.

Orthopaedic Research Society, San Francisco, CA , March 2004.

Department of Physical Medicine and Rehabilitation Grand Rounds, University of Pittsburgh, April 2004.

Department of Physical Therapy Annual Student Seminar, University of California, San Francisco, May 2004.

Orthopaedic Research Society, Washington, D.C., February 2005.

Skeletal Muscle Research Group, National Institutes of Health, Bethesda, M.D. March 2005.

Keynote Speaker, Federation of the European Societies for Surgery of the Hand (FESSH), Göteborg, Sweden, June 2005.

Physical Disabilities Branch, National Institutes of Health, February 2006.

Visiting Professor, Program in Physical Therapy, Washington University in St. Louis, September, 2006.

Department of Biophysics, University of Pécs, Hungary, June 2007.

Biophysical Society, San Francisco, CA, February 2010.

Orthopaedic Research Society, New Orleans, LA, March 2010.

Tetraplegia Surgery Meeting, Paris, France, September, 2010.

Department of Engineering, Cornell University, Ithaca, NY, November, 2010.

ETH, Zurich, Switzerland, May 2010.

American Academy of Orthopaedic Surgeons, San Diego, February, 2011.

Keynote Speaker, Engineering Leadership Forum, UCSD Institute for Engineering in Medicine, February 2011.

Department of Biology Seminar Series, Rensselaer Polytechnic University, Troy, NY, September, 2012.

Gayle G. Arnold Lectureship, American Academy of Cerebral Palsy and Developmental Medicine, Toronto, Canada, September, 2012.

Distinguished Alumnus Lecture, University of California, Davis, October 2013.

Distinguished Lecturer, Hospital for Special Surgery, New York, February 2014.

Founders Lecture, American College of Sports Medicine, Costa Mesa, October 2014.



Kelly Visiting Professor, Mayo Clinic, Rochester, MN, November 2014.

David Kilmer Memorial Lecture, University of California, Davis, September 2015.

Foundation Matrice Lecture, European Academy of Developmental Medicine, Amsterdam, Netherlands, May 2017.

Hay Memorial Lecture, American Society of Biomechanics, Boulder, CO, August 2017.