Curriculum Vitae

Robert G. Dennis, Ph.D.

Please note: This CV is posted on the web at: http://www-personal.umich.edu/~bobden/bob_cv.html
From this web page you can download a full version of my dissertation, full text versions of all of my recent patents and publications, and many of my recent abstracts and book chapters.

For a detailed description of my current research interests, please visit my web page at:
http://www-personal.umich.edu/~bobden/

PERSONAL DATA:

ROBERT GLENN DENNIS, PH.D.

CURRENT ACADEMIC APPOINTMENTS:

Assistant Research Scientist, Institute of Gerontology and Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI 48109. bobden@umich.edu

Assistant Professor, Department of Mechanical Engineering, University of Michigan, Ann Arbor, MI 48109. bobden@umich.edu

Assistant Professor, Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI 48109

Visiting Research Scientist, Harvard-MIT Division of Health Sciences and Technology and the Artificial Intelligence Laboratory, Massachusetts Institute of Technology, Cambridge, MA 02139. bdennis@ai.mit.edu

EDUCATION:

Ph. D. (1988 – 1996)	Biomedical Engineering, Bioengineering Program, University of Michigan, Ann Arbor, MI.
M. S. (1988 – 1992)	Kinesiology (Human Motor Control), Department of Physical Education, University of Michigan, Ann Arbor, MI.
M. S. (1988 – 1992)	Biological Engineering, Bioengineering Program, University of Michigan, Ann Arbor, MI.
B.S.E. (M.E.) (1982 – 1987)	Mechanical Engineering, Department of Mechanical Engineering and Applied Mechanics, University of Michigan, Ann Arbor, MI.

INSTRUCTIONAL EXPERIENCE:

1983-1985	Teaching Assistant/Laboratory Instructor ME101: Mechanical drawing. Provided laboratory instruction, assignment and grading of examinations.
1990-1991	Instructor Biomechanics 330: Introductory mechanics and joint biomechanics. Redesigned an existing course. Kinesiology Department, University of Mich.
1990-1991	Instructor Biomechanics 430: Musculoskeletal Tissue Mechanics. Designed an entirely new course offering in tissue biomechanics, using an existing course number. Kinesiology Department, University of Michigan.
1993	Teaching Assistant Physiology 519: Quantitative Physiology. Departments of Biomedical Engineering and Physiology, University of Michigan.
1998-1999	Instructor Biomedical Eng 450: Biomedical Design. Developed the capstone design course for the newly-formed Department of Biomedical engineering. Instructed the course for the first two terms it was offered. Department of Biomedical Engineering, University of Mich.
1997-2001	Guest Lecturer for the following courses: Bio 428: Cell Biology; BME 295: Biomedical Eng Survey; ME 456: Biomechanics; BME 590: Cellular and Molecular Biomechanics; BME 800, FTE Seminar Series; CDB 682: Organogenesis of Complex Systems: Skeletal Muscle; BME 519: Quantitative Physiology.

RESEARCH AND PROFESSIONAL EXPERIENCE:

1985-1986 **Engineering Intern** Hughes Aircraft Co., Electro-Optical & Data Systems Group. Designed and tested components and processes for kinetic energy anti-satellite weapons systems.

1987-1988 **Electro-Mechanical Engineer** Lectron Products Inc., Rochester Hills, MI 48308. Designed and numerically modeled electromechanical components for electronic automatic transmissions, fluid level sensors, and electromechanical actuators.

1989-1991 **Technician and Machinist** Environmental Research Institute of MI, Ann Arbor, MI. Designed test fixtures for the materials testing laboratory while in graduate school.

1990-1991 **Research Collaborator** Department of Surgery, Section of Thoracic Surgery, U-Mich. Designed implantable micro-power electronic stimulator systems to re-engineer latissimus dorsi muscle (in vivo) for use in a transposition surgical technique as a biologic left ventricular assist device. Also numerically modeled aortic flow through a distensible aorta, and designed incidental instrumentation and test fixturing (sonomicrometers, stents, data acquisition system interface electronics).

1992-1996 **Research Assistant** Muscle Mechanics Laboratory (Advisor: John A. Faulkner). U-Mich. During graduate school, provided engineering design and fabrication support for a muscle physiology laboratory.

1993-1996 **Owner and Chief Engineer** Bio Logic Engineering Inc., Dexter, MI. Founded a small instrumentation design company, based in Dexter, MI. Designed custom instrumentation for automotive, energy, and medical concerns. Designs included high-precision engine valve positioners for flow test benches at Ford Motor Company, a diagnostic device for blepharoptosis, an optical disdrometer for quantitative measurement of the size and velocity of atmospheric precipitants, and timing and control fixturing for hydrogen sulfide embrittlement testing.

1996-1998 **Research Investigator** Institute of Gerontology, U- Michigan, Ann Arbor, MI. First research faculty appointment. Initiated the Functional Muscle Tissue Engineering research core within the Muscle Mechanics Laboratory at the University of Michigan.

1998-1999 **Director** Mechanotransduction Core Nathan Shock Center of Excellence, IoG, U-M. Provided support for the design of experiments and instrumentation in the area of mechanotransduction in musculoskeletal tissues.

1998- **Assistant Research Scientist** Institute of Gerontology, U- Michigan, Ann Arbor, MI.

1998- **Assistant Research Scientist** Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI.

1999- **Co-founder, Biomechatronics Group** MIT Artificial Intelligence Laboratory, Cambridge, MA. With Hugh Herr, Ph.D., Co-founded the Biomechatronics group within the Artificial intelligence laboratory at MIT to develop muscle-based robotic actuators and hybrid prosthetic devices. Designed, built and tested the first muscle-actuated robot in September, 2000.

1999- **Research Scientist** Harvard-MIT Health Sciences and Technology, Cambridge MA. Jointly appointed between the University of Michigan, MIT, and Harvard on the primary research staff.

1999- **Research Scientist** MIT Artificial Intelligence Laboratory, Biomechatronics Group, Cambridge MA.

PROFESSIONAL ACTIVITIES:

1985-1987 American society for metals (ASM)

2000 member, Biomedical Engineering Society (BMES)

Ad Hoc Reviewer: Journal of Applied Physiology, Biotechnology & Bioengineering; Mathematical Biosciences; Transactions on Biomedical Engineering.

Member of the Center for Biomedical Engineering Research (CBER), University of Michigan (1997-2000).

TRAINING AND LICENSES:

FCC Amateur Radio License: KC8PTJ Technician Class.

Class 100 Clean Room Operations, Hughes Aircraft Company.

Operation of Cryogenic and Environmental Test Facilities, Hughes Aircraft Company.

Microisolation Techniques for SPF Animal Facilities, University of Michigan.

CONSULTING:

1991-1992 Section of Thoracic Surgery, U-Mich.: Left Ventricular Assist Device.
1996-Present NASA-Johnson Space Center; Bioreactor Design for Microgravity Cell Culture.
1998-1999 Environmental Astrobiology Research Center, Tulane University Medical Center, New Orleans LA; Member, Scientific Advisory Board (1998-1999).
2000-2002 Cell-Based Delivery, Inc. Providence RI.
2001-Present FlexCell International, Chapel Hill, NC.
2001-Present Protein Construction, Inc., Seattle WA.

PATENTS AND TECHNOLOGY DISCLOSURES:

1. Cole, N.M., and **Dennis, R.G.,** Single-wave linear interferometric force transducer. U.S. Patent Number 5555470.
2. **Dennis, R.G.,** Kosnik, P.E, System and method for emulating an in vivo environment of a muscle tissue specimen. U.S. Pat No. 6114164.
3. **Dennis, R.G.,** Kosnik, P.E., Kuzon, W.M. and Faulkner, J.A., Mammalian Muscle Construct and Method for Producing Same U.S. Patent No. 6,207,451 (issued 27 March 2001.)
4. Dennis, R.G. & Kosnik, P.E. System and method for emulating an in vivo environment of a muscle tissue specimen. U.S. Pat No. 6303286
5. Cederna, P.S., **Dennis, R.G.,** Kuzon, W.M. Chemically acellualrized peripheral nerves for use in clinical nerve reconstruction. (University of Michigan TMO File # 1822, 17 January 2000).

HONORS AND AWARDS:

1995-1996 Whitaker Fellow, Musculoskeletal Tissue Engineering, U-M, Ann Arbor, MI

Calderon, M., Goldman, D., **Dennis, R.G.,** Kuzon, W. (Co-supervisor), Clifford F. Snyder Past Chairmans' Research Award, 44th Annual Meeting, Plastic Surgery Research Council. 1999, Myogenic regulatory factor expression in satellite cells cultured from adult and old rat skeletal muscles.

Haase, S., Cederna, P., **Dennis, R.G.,** Kuzon, W. (Co-supervisor), Outstanding Research Presentation, Annual Resident Research Forum, 19 April 2000, St. Joseph Mercy Hospital, Ann Arbor, Michigan. Acellular Nerve Grafts for Nerve Gap Repair.

UNIVERSITY OF MICHIGAN COMMITTEE SERVICE:

1997-2000 Graduate Education Committee, Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI
1998 Curriculum Task force, Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI
1998-2000 Qualifying Examination Coordinator, Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI
1999-2000 College of Engineering Safety Committee, University of Michigan College of Engineering
2000- Department of Biomedical Engineering, student advisor for the Biomedical Engineering Society .

DOCTORAL COMMITTEES:

1. Paul Kosnik, Ph.D., completed May 2000. Contractile Properties of Engineered Skeletal Muscle (**Robert Dennis** and John Faulkner, Co-Chairs), Department of Biomedical Engineering, University of Michigan.
2. Mark Palmer (Scott Hollister, Chair), Department of Mechanical Engineering, University of Michigan.

3. Douglas Dow (**Robert Dennis** and John Faulkner, Co-Chairs), Department of Biomedical Engineering, University of Michigan.
4. Janeta Nikolovski. (David Mooney, Ph.D., Chair), Department of Biomedical Engineering, University of Michigan.
5. Rupak Rajachar (David Kohn, Ph.D., Chair), Department of Biomedical Engineering, University of Michigan.
6. Thomas Goodwin, (Timothy Hammond, Chair, Tulane Medical Center; NASA Johnson Space Center) the Union Institute.
7. Erik Rader (**Robert Dennis** and John Faulkner, Co-chairs) Department of Biomedical Engineering, University of Michigan.
8. William L. Murphy (David Mooney, Chair) Department of Biomedical Engineering, University of Michigan.
9. Yen-Chih Huang (**Robert Dennis**, Chair) Department of Biomedical Engineering, University of Michigan.
10. Gary Brouhard (Alan Hunt, Chair) Department of Biomedical Engineering, University of Michigan.
11. Henry (Trey) Schek (Alan Hunt, Chair) Department of Biomedical Engineering, University of Michigan.
12. Ravi K Birla (**Robert Dennis**, Chair) Department of Biomedical Engineering, University of Michigan
13. Jeongsup Shim (Shuichi Takayama, Chair) Department of Biomedical Engineering, University of Michigan.

INVITED SPEAKER:

1. 7th Annual Summer Training Course in Experimental Aging Research. Tissue engineering of skeletal muscle from aged mammals. Ann Arbor, MI, June13-17, 1999. (Organized by Richard Miller, M.D., Ph.D.).
2. Pittsburgh Orthopaedic Tissue Engineering Symposium. Isometric contractile properties of mammalian skeletal muscle constructs engineered in vitro. Pittsburgh, PA, April 16-19, 2000.
3. Functional Tissue Engineering Workshop, 1st annual, Engineered skeletal muscle and neuromuscular tissues, September 14-17, 2000, Tampa, FL, (organizing committee; David L. Butler, Steven A. Goldstein, Farshid Guilak, David J. Mooney).
4. DARPA Workshop on Biological Motors. *An Actin-Myosin Machine*. October 23, 2000, Arlington, VA. (Organized by Alan Rudolph, Ph.D., Robert Nowak, Ph.D., and Keith Ward, Ph.D.)
5. DARPA Controlled Biological and Biomimetic Systems (CBBS) Program Review, *Living Muscle actuators.* Breckenridge, CO, March 18-21, 2001.
6. DARPA Self-Aid Concept Development Workshop (DARPA/DSO), In Vitro Tissue Engineering of Muscle and Nerve. Potomac Institute, Arlington, VA, May 23-24, 2001
7. Defense Sciences Research Council (DSRC) Functional Tissue and Interface Engineering. July 9, 2001 DSRC Summer Conference (Portland, OR).
8. DARPA-DSO Biomolecular Motors Workshop. Cell and Tissue-Based Mechanical Actuators. October 22, 2001, Arlington, VA.

DOCTORAL DISSERTATION:

Robert Dennis, Ph.D., 1996, Measurement of pulse propagation in single permeabilized skeletal muscle fibers by optical diffraction. (Chair: J.A. Faulkner) University of Michigan Department of Biomedical Engineering, Ann Arbor, MI.

PEER-REVIEWED PUBLICATIONS:

1. Borer K.T. and **Dennis R.G.** Activity disc and cage for continuous measurement of running activity and core temperature in hamsters. Physiology and Behavior 50:2-6, 1991.
2. Miller S.W. and **Dennis R.G.** A parametric model of muscle moment arm as a function of joint angle: Application to the dorsiflexor muscle group in mice. J Biomechanics 29(12): 1621-24, 1996.

3. Macpherson P.C.D., **Dennis R.G.** and Faulkner J.A. Sarcomere dynamics and contraction-induced injury to maximally activated single muscle fibers from soleus muscles of the rat. J Physiol 500.2: 523-33, 1997.
4. **Dennis R.G.** Bipolar implantable stimulator for long-term denervated muscle experiments. Med & Biol Eng & Comput Med & Biol Eng & Comput, March, 36: 225-28, 1998.
5. Putnam A.J., Cunningham, J.J., **Dennis R.G.,** Linderman J.J., Mooney D.J., Microtubule assembly is regulated by externally-applied strain in cultured smooth muscle cells. J. Cell Sci., 111: 3379-3387, 1998.
6. **Dennis R.G.,** Kosnik P. Excitability and isometric contractile properties of mammalian skeletal muscle constructs engineered in vitro. In Vitro Cell. Dev. Biol. Anim. 36(5): 327-335, 2000.
7. **Dennis R.G.,** Kosnik P., Gilbert M.E., Faulkner, J.A. Excitability and contractility of skeletal muscle engineered from primary cultures and cell lines. Am J Physiol Cell Physiol 2001 280: C288-C295.
8. Haase, S., Cederna, P., **Dennis, R.G.,** Kuzon, W. Peripheral Nerve Reconstruction Using Acellular Nerve Grafts. Surgical Forum. 51: 607-609, 2000.
9. Kosnik P. Jr., **Dennis R.G.,** Faulkner J.A. Functional Development of engineered skeletal muscle from adult and neonatal rats. Tissue Engineering 7(5) 573-584, 2001.
10. Murphy, W.L., Dennis, R.G., Kileny, J., Mooney, D.J., Salt fusion: a method to improve pore interconnectivity within tissue engineering scaffolds (In Press, Tissue Engineering)

ARTICLES IN PREPARATION OR SUBMITTED FOR PUBLICATION:

1. **Dennis R.G.** Compliant loading and electrical stimulation of engineered skeletal muscle constructs. (in preparation).
2. Macpherson P.C.D., Faulkner J.A. and **Dennis R.G.** Excitability of soleus muscles from rats after denervation and denervation stimulation. (in preparation).
3. **Dennis R.G.,** Dow D. Faulkner J.A. Maintenance of mass and force in denervated skeletal muscles using a microprocessor-based implantable stimulator (in preparation).
4. **Dennis R.G.,** A servomechanism for the in vivo exercise and evaluation of rat and mouse limb plantar and dorsi flexor muscles (in preparation).
5. **Dennis R.G.,** Kosnik, P., Pasyk, K., Faulkner, J.A. Excitability and contractility of engineered muscle tissue from adult and aged rats. (in preparation).
6. **Dennis, R.G.,** Goodwin, T. Application of controlled, low-level electromagnetic fields to cells in 2- and 3- dimensional culture systems. (in preparation).
7. **Dennis R.G.,** Goodwin, T., Wolf, D. Effect of low-level time-varying magnetic fields on cell proliferation, metabolism, and gene expression *in vitro*. (in preparation).

BOOK CHAPTERS AND OTHER PUBLICATIONS:

1. Worringham C.J. and **Dennis R.G**. Distance Errors: Pointing to the range effect. Behavioral Brain Science 15:352-53, 1992.
2. Faulkner J.A., Brooks S.V., **Dennis R.G.** and Lynch G.S. The functional status of dystrophic muscles and functional recovery of skeletal muscles following myoblast transfer. In: Basic and Applied Myology: Special Issue. M. Grounds, Ed., 7:257-264, 1997.
3. Faulkner J.A., Brooks S.V. and **Dennis R.G.** Methods for the measurement of the recovery of function following whole muscle transfer, myoblast transfer, and gene therapy. In: Methods in Tissue Engineering, 1997.
4. Kuzon W.M. Jr., **Dennis R.G.,** Soroosh N.E. Invited Discussion: Quantitative facial motion analysis after functional free muscle reinnervation procedures: Plast. Reconstr. Surg. 100: 7, 1710-1722, 1997.
5. Faulkner, J.A., Brooks, S.V., and **Dennis R.G.** Measurement of recovery of function following whole muscle transfer, myoblast transfer, and gene therapy. In: Methods in Molecular Medicine, Vol. 18: Tissue Engineering Methods and Protocols. J. Morgan and M.L. Yarmush, Ed., Humana Press Inc., Totowa, NJ, 1998.

6. Faulkner, J.A., Brooks, S.V. and **Dennis, R.G.** Measurement of Recovery of Function Following Whole Muscle Transfer, Myoblast Transfer, and Gene Therapy. Meth. In Mol. Med., 18: 155-172, 1998.
7. Kosnik P. and **Dennis R.G.,** Mesenchymal Cell Culture: Functional Mammalian Skeletal Muscle Constructs. In Methods in Tissue Engineering, A. Atala and R Lanza, eds. San Diego: Harcourt, Academic Press, Chapter 23, 299-306, 2002.
8. **Dennis R.G.** and Kosnik, P., Mesenchymal Cell Culture: Instrumentation and Methods for Evaluating Engineered Muscle. In Methods in Tissue Engineering, A. Atala and R Lanza, eds. San Diego: Harcourt, Academic Press, Chapter 24, 307-316, 2002.
9. **Dennis R.G.** Engineered skeletal muscle: nerve and tendon tissue interfaces, contractility, excitability, and architecture. In: Functional Tissue Engineering, F. Guilak, D. Butler, D. Mooney, and S. Goldstein, eds. Springer-Verlag New York (submitted).
10. Kosnik, P.E., **Dennis, R.G.,** and Vandenburgh, H.H., . Tissue engineered skeletal muscle (review). In: Functional Tissue Engineering, F. Guilak, D. Butler, D. Mooney, and S. Goldstein, eds. Springer-Verlag New York (in preparation).
11. Faulkner, J.A., **Dennis, R.G.** Excitability and contractility of skeletal muscle: measurements and interpretations. In: Functional Tissue Engineering, F. Guilak, D. Butler, D. Mooney, and S. Goldstein, eds. Springer-Verlag New York (in review).

ABSTRACTS

1. **Dennis R.G.** and Cole N.M. A high-stiffness, high-sensitivity force transducer based on Michelson's interferometer. Biophysical Journal 64: A256, 1993.
2. **Dennis R.G.** and Opiteck J.A. Measurement of moment arm for the dorsiflexor muscle group of the mouse hindlimb. Med Sci Sport Exercise 26: S97, 1994.
3. Macpherson P.C.D., **Dennis R.G.** and Faulkner J.A. Changes in impedance and excitability of soleus muscles from rats after 4 weeks of denervation. FASEB J 11: A56, 1997.
4. Faulkner J.A., Brooks S.V., **Dennis R.G.,** Kuzon W.M., Devor S.T., Lynch G.S., Macpherson P.C.D. Terminology in muscle mechanics: the case for miometric, isometric, and pliometric contractions. ACSM Abstracts, 1997.
5. Macpherson, P.C.D., Faulkner, J.A., and **Dennis, R.G.** Electrical stimulation attenuates the effects of short-term denervation in soleus muscles of rats. ACSM 1997.
6. Soroosh, N., **Dennis, R.G.,** Kosnik, P., Kuzon, W. Quantifying Facial Motion in Three Dimensions. Journal of Reconstructive Microsurgery 14(8):603-604, 1998.
7. Calderon, M., Goldman, D., **Dennis, R.G.,** Kuzon, W. Myogenic Regulatory Factor Expression in Satellite Cells Cultured from Adult and Old Rat Skeletal Muscle. 1999 Annual Moses Gunn Research Conference, 29 April, 1999, University of Michigan, Ann Arbor, Michigan.
8. Calderon M.S., Goldman D.J., **Dennis R.G.,** Kuzon W.M. Myogenic regulatory factor expression in satellite cells cultured from adult and old rat skeletal muscles. 44th Annual Meeting, Plastic Surgery Research Council, 22-25 May 1999, Pittsburgh, Pennsylvania., Abstract #50A.
9. **Dennis, R.G.,** Kosnik, P.E., Faulkner, J.A., Kuzon, W.M. Contractile function of in vitro tissue-engineered skeletal muscle constructs. 44th Annual Meeting, Plastic Surgery Research Council, 22-25 May 1999, Pittsburgh, Pennsylvania., Abstract #63A.
10. Dow D.E., **Dennis R.G.,** Hassett C.A., Faulkner J.A., Electrical stimulation protocol to maintain mass and contractile force in denervated muscles. BMES-EMBS 1st Joint Conference, Session 6.1.2 Functional Neuromuscular Stimulation, Paper 573, 1999.
11. Calderon, M., **Dennis, R.G.,** Kosnik, P., Faulkner, J., Goldman, D., Kuzon, W. Snyder Award Presentation: Myogenic regulatory factor expression in satellite cells cultured from adult and old rat skeletal muscles. 68th Annual Scientific Meeting, American Society of Plastic and Reconstructive Surgery, 23-27 October 1999, New Orleans, Louisiana.

12. Haase, S., Cederna, P., **Dennis, R.G.,** Kuzon, W. Repair of nerve gaps with acellular nerve grafts. 2000 Annual Moses Gunn Research Conference, 17 March 2000, University of Michigan, Ann Arbor, Michigan.
13. Haase, S., Cederna, P., **Dennis, R.G.,** Kuzon, W. Acellular Nerve Grafts for Nerve Gap Repair. Annual Resident Research Forum 19 April 2000 St. Joseph Mercy Hospital, Ann Arbor, Michigan.
14. Haase, S., Cederna, P., **Dennis, R.G.,** Kuzon, W. Acellular Nerve Grafts For Nerve Gap Repair. 45th Annual Meeting, Plastic Surgery Research Council, 17-20 May 2000, Seattle, Washington.
15. Palmer, M.L., Hollister, S.J, **Dennis R.G.,** Faulkner, J.A. A hierarchical model of quiescent and maximally activated fiber during stretch. Biophys J, (Jan) 78:1, part 2 of 2, #1972-Pos, p.333A, 2000.
16. Palmer, M.L., Faulkner, J.A., **Dennis R.G.,** Hollister, S.J. A hierarchical model of a quiescent and activated skeletal muscle fiber during stretch. International Conference on Mechanics in Medicine and Biology, April 1-5, 2000.
17. Haase, S., Cederna, P., **Dennis, R.G.,** Kuzon, W. Nerve Gap Repair with Acellular Nerve Grafts. 5th Annual University of Michigan Dingman Plastic and Reconstructive Surgery Research Conference, June 16, 2000, Ann Arbor, Michigan.
18. Haase, S., Cederna, P., **Dennis, R.G.,** Kuzon, W. Acellular Nerve Grafts for Repair of Peripheral Nerve Gaps. Bi-annual Scientific Meeting, Reed O. Dingman Society, September 7-9, 2000, Ann Arbor, Michigan.
19. Faulkner, J.A., **Dennis R.G.** Excitability and Contractility: Measurements and Interpretations. Proceedings of the First Functional tissue Engineering Workshop, September 15-17, 2000.
20. **Dennis, R.G.,** Herr, H. An Actin-Myosin Machine. DARPA Controlled Biological Systems-Tissue Based Biosensors (CBS-TBB), San Antonio, Texas, April 2000.
21. Faulkner, J.A. Macpherson, P.C.D., Stucky, M.J., Claflin, D.R., Brooks, S.V., and **Dennis, R.G.** Sarcomere heterogeneity during stretches of passive and activated single permeabilized fibers from fast and slow muscles of young and old rats: mechanism of injury. Session number A3: Mechanical function of muscle: Molecules to movements. Society for Experimental Biology, Exeter, England, Feb 2000.
21. Haase, S.C., Cederna, P.S., **Dennis, R.G.,** Kuzon, W.M. Peripheral Nerve reconstruction Using Acellular Nerve Grafts. 86th Annual Clinical Congress of the American College of Surgeons, Chicago, Illinois, October 22-27, 2000.
22. **Dennis R.G.** Engineered skeletal muscle and neuromuscular tissues. Proceedings of the First Functional tissue Engineering Workshop, September 15-17, 2000.
23. Faulkner, J.A. and **Dennis, R.G**. Excitability and Contractility: Measurements and Interpretations. Proceedings of the First Functional Tissue Engineering Workshop, September 15-17, 2000.
24. Dow D.E., **Dennis R.G.,** Hassett C.A., Faulkner J.A., "Electrical Stimulation to Maintain Functional Properties of Denervated EDL Muscles of Rats", 31st Annual Neural Prosthesis Workshop, National Institutes of Health, Lister Hill Center, Oct. 25-27, 2000.
25. Boxer, L.K., van der Meulen, J.H., **Dennis, R.G.,** Kuzon, W.M., Cederna, P.S. The immunogenicity of peripheral nerve allografts is related to the cellular components. American Society for Peripheral Nerve, January 13-14, 2001, San Diego, California.
26. Dow, D.E., Hassett, C.A., Cederna, P.S., **Dennis, R.G.,** Faulkner, J.A.. Chronic Electrical Stimulation to Maintain Mass and Force in Denervated EDL Muscles of Rats. American Society for Peripheral Nerve, January 13-14, 2001.
27. Rovak, J., Haase, S., Boxer L., **Dennis, R.G**., Bishop, K., Kuzon, W., Jr., Cederna, P., Acellularized peripheral nerve allograft repopulated with isogenic Schwann cells: A non-immunogenic construct that supports axonal growth across short nerve gaps. Second Leiden International Medical Students Congress (LIMSC), March 16-17, 2001, Leiden, the Netherlands.
28. Calve, S., Arruda, E, **Dennis, R.G**., and Grosh, K. Influence of mechanics on tendon and muscle development. WCCM, 2002.

29. **Dennis, R.G**., Douglas E. Dow, Ann Hsueh, John A. Faulkner. Excitability of engineered muscle constructs, denervated and denervated-stimulated muscles of rats, and control skeletal muscles in neonatal, young, adult, and old mice and rats. Biophysical Society Meeting, Feb, 2002.

FUNDING: PAST SUPPORT

Skeletal Muscle Tissue Engineering from Primary Culture. Center for Biomedical Engineering Research. (**Robert Dennis, PI**), period: 11/1/1997 - 10/30/1998

Cultured skeletal muscle myooids from young, adult, and old rats. The Nathan Shock Center of Excellence, Pilot Grant Award (**Robert Dennis, PI**) period: 11/1/1999 - 10/30/2000.

Exercise, Injury & Repair of Muscle Fibers in Aged Mice. National Institute of Aging. (John A. Faulkner, PI, **Robert Dennis, Research Faculty**), period: 1996 - 2001.

Exercise, Injury & Repair of Muscle Fibers in Aged Mice. National Institute of Aging. (John A. Faulkner, PI, **Robert Dennis, Research Faculty**), period: 1996 - 2001.

An Actin Myosin Machine, DARPA BAA #99-31 (Hugh Herr, PI, MIT; **Robert Dennis, Co-I**), Pilot study, $375,000 period: 12/01/00 - 11/30/01

Biomedical Technology Development Fund, University of Michigan. A Commercial Biodevelopmental Emulator for Skeletal Muscle. 2000-2001 (**Robert Dennis, PI**; W. Kuzon, Co-I).

FUNDING: CURRENT SUPPORT

Genetic Modification of Striated Muscles During Aging, Project #2: Skeletal Muscle Structure and Function in Aging MDX Mice, and Contractility Core (Jeffrey S. Chamberlain, PI, **Robert Dennis, Co-I**), Department of Health and Human Services, period: 1998 - 2003.

Engineering skeletal muscle with biodegradable hydrogels. PA# DE-98-009 (PI: David J. Mooney, University of Michigan; **Co-PI: Robert Dennis**), Agency: NIDCR, Type: R0-1, period: 01/01/00 – 01/31/05.

Guidance of gene Expression and Metabolism in Excitable Tissues (Muscle) using Time-Varying Micro-Magnetic Fields. R.G. Dennis, PI, DARPA Metabolic Engineering Program, 8/2001 – 7/2002.

Human Augmentation through Advanced Brain Machine Interfaces. DARPA BAA #01-42 (Brain Machine Interfaces). Daryl Kipke, PI, R.G. Dennis, Co-I. 6/02 - 5/07.

FUNDING: PENDING & PLANNED APPLICATIONS:

DARPA (BAA #01-47): Engineered Muscle Actuators: Cells and Tissues. **Robert Dennis, PI**; Jan 2002