

**ARTHUR C. VAILAS, PH.D.**  
**BIOGRAPHICAL INFORMATION**

**PERSONAL**

Name: Arthur C. Vailas  
Office address: University of Houston  
Vice Chancellor/Vice President for Research  
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Office fax: 713-743-9125  
Office email: [availas@uh.edu](mailto:availas@uh.edu)  
Home email: [availas@sbcglobal.net](mailto:availas@sbcglobal.net)

**EDUCATIONAL HISTORY**

1979-1982 Postdoctoral Fellow, University of Iowa, Department of Biochemistry  
1979 Doctor of Philosophy, University of Iowa  
1973 Bachelor of Science, University of New Hampshire

**EMPLOYMENT HISTORY**

1998-present **University of Houston System**  
Vice Chancellor for Research and Intellectual Property Management  
2002 Joint appointment as Professor in Mechanical Engineering, College of Engineering and Biology and Biochemistry, College of Natural Sciences and Mathematics, University of Houston.  
1997-present **University of Houston, Main Campus**  
Vice President for Research and Intellectual Property Management  
1995 Vice Provost for Research and Graduate Studies  
Professor and Distinguished Chair, Biology and Biochemistry (tenured faculty)

- 1994            **University of Wisconsin-Madison**  
Associate Dean for Research and Development, School of Education
- 1993            **University of Wisconsin-Madison**  
Professor and Department Chair, Kinesiology
- 1991            **University of Wisconsin-Madison**  
Professor of Surgery, Division of Orthopedic Surgery  
College of Medicine
- Professor, Department of Poultry Science  
College of Agriculture and Life Sciences
- Professor, Department of Kinesiology
- Director, Biodynamics Laboratory
- 1988            **University of Wisconsin-Madison**  
Associate Professor, (tenured faculty) Kinesiology, School of Education
- Associate Professor, Poultry Science, College of Agriculture
- Associate Professor, Surgery, College of Medicine
- Director, Biodynamics Laboratory
- 1988            **University of California - Los Angeles**  
Associate Professor (tenured faculty), Department of Physiological  
Science
- 1982            **University of California - Los Angeles**  
Assistant Professor, Department of Physiological Science
- 1979-1982      **University of Iowa**  
Research Fellow, Departments of Orthopaedics and Biochemistry
- 1973            **Phillips Exeter Academy**  
Summer Program Assistant Athletic Trainer (football and basketball)  
Exeter, New Hampshire

## **HONORS**

- 2002            Governor's Appointment Texas Council on Environmental Technology
- 2002            Congressional Appointment to National Board Mickey Leland National  
Urban Air Toxic Research Center

- 2000 Manchester Central Hall of Fame, for education and scientific achievements, Manchester, NH
- 1998 Phi Beta Delta International Scholars Award, University of Houston,
- 1995 Distinguished Chair, Department of Biology and Biochemistry, University of Houston
- 1995 Outstanding Science Achievement Award COSMOS #2229, U.S.-Russian Space Program, NASA
- 1992 Outstanding Achievement Award for US-Russian Life Sciences Mission Cosmos-2044, NASA Headquarters, Washington, DC
- 1988 Elected member of National Research Council by the National Academy of Sciences Commission on Engineering and Technical Systems, Assignment to the Committee of Commercially Developed Space Facility for NASA, Washington, DC
- 1988 NASA - Soviet Life Science Delegate, Scientific Exchange for Cosmos 1887 and 2044, Moscow, Russia
- 1987 Distinguished Scientist, California State University-Long Beach, CA
- 1986 Faculty Academic Career Development Award, UCLA
- 1983 Elected Fellow, American College of Sports Medicine
- 1980-1982 Recipient of NIH National Research Service Award, University of Iowa, Orthopaedics
- 1979 NIH Institutional Research Award, University of Iowa, Orthopaedics
- 1977 NIH Graduate Trainee, University of Iowa, Exercise Physiology, Connective Tissue Physiology
- 1973 *Magna Cum laude*, University of New Hampshire
- 1972 Newman Scholar, University of New Hampshire
- 1972 Senior Key, University of New Hampshire
- 1969 Athletic Football Scholarship, University of New Hampshire

## ADMINISTRATIVE EXPERIENCE

- Present            **University of Houston System and University of Houston**
- Vice Chancellor of all five UH System Campuses and Vice President of the University of Houston Main Campus. Coordinate system wide extramural programs, technology transfer, research policies and administrative procedures, legislative special items, and some system budget oversight. Manage research compliance and self-studies, all copy rights, patents, all transfer agreements, all research agreements, incubator programs and licenses.
- 1997            Vice Provost for Research and Graduate Studies, University of Houston
- Research:* Sponsored programs, human subjects, Research Council, interdisciplinary research centers and institutes, research policies and ethics, institutional agreements, technology transfer, animal care, radiation safety, Texas Commission for Research, indirect costs, faculty start-up, research space and equipment.
- Graduate Studies:* Graduate and Professional Studies Council, all graduate affairs and programs, student scholarships/fellowships, institutional liaison to state and federal governmental relations for research and graduate education
- 1994            **University of Wisconsin-Madison**
- Associate Dean for Research and Development, School of Education. Responsible for faculty development, graduate program development, scholarships and awards, research policies and human subjects review
- 1993            Member, trainee and discussion chair, University Administrative Development Program of Higher Education Administrative Leadership Program
- Member, Administrative Council, School of Education.  
Organized evaluation strategies, formulated research strategic plans and reports
- Member, Academic Planning Council, School of Education.  
Program reviews and proposals
- Department Chair, Kinesiology. All academic programs associated with Physical Therapy, Occupational Therapy and Kinesiology. Coordinated the integration of departments associated with the allied health professions merger
- 1991-1992      Graduate Studies Coordinator, Department of Kinesiology.  
All graduate programs and policies

- 1990 Undergraduate Studies Coordinator, Department of Kinesiology.  
All undergraduate programs
- 1989 Member, Board of Trustees, and Research Coordinator for Sports  
Medicine Program
- 1988-1994 Director of a University Regents Laboratory, the Biodynamics  
Laboratory (chartered, 1967). Program development and management  
that integrated ergonomics, molecular biology and biomechanics
- Program Project Director, "Connective Tissue Responses to Exercise in  
Man", sponsored by the Office of Naval Research
- 1982-1988 **University of California-Los Angeles**  
Director, Connective Tissue Research Laboratory. Departments of  
Physiological Science and Orthopedic Surgery

### **National Service**

- 2002 Executive Board Member, Research Partnership for Securing Energy for  
America, Chicago Illinois and Houston Texas
- 2002 Executive Committee Member, Southeast Biotechnology Park Coalition,  
Houston Texas
- 2002 National Board on Urban Air Toxic Research Center Mickey Leland  
Center Houston Texas
- 2001 Space Education Initiatives, Inc. Board of Directors, Green Bay,  
Wisconsin
- Board Member, Association of Western Universities
- Board Member, Southern Universities Research Association
- Panel Member and Chair, Kentucky NASA EPSCoR Program
- Committee Member for Costal Impact Initiative, Southern University  
Research Association, Washington DC
- Executive Committee University Gulfcoast Consortium, Houston Texas
- 2000 Member, American Association for the Advancement of Science, Panel  
for Research Competitiveness

- 1999 Panel Member, American Association for the Advancement of Science. Advised on National Science Foundation Strategic Plan on National Computing and Infrastructure
- 1996 Elected Member of NASA Life and Microgravity Sciences Subcommittee, 1995 and 1996
- Chair, NASA EPSCoR Science Review Panel for State of Kentucky Project
- Member, NASA Task Force on Review of Medical Operations Associated with Long Duration Space Flight
- 1995 Study Section Chair, NASA-NSF EPSCoR Program Review State of Kentucky, Lexington, KY
- Study Section Member, NIH Small Business Innovative Research Program
- Study Section Member, NIH Small Business Innovative Research Program
- External Reviewer, Veterans Administration-Grants Science Merit Reviews, Livermore, CA
- Member, Science Panel for Peer Review System for US-MIR Research Proposals, NASA, Cape Canaveral, FL
- 1994 Elected Member, Advisory Board, New Hampshire Musculoskeletal Institute, Manchester, NH
- Elected Member, NASA Life Sciences Advisory Subcommittee, Washington, DC
- Member, NASA Committee on Centrifuge Project Review Committee on Space Station, Washington, DC
- External Reviewer, American Heart Association
- Study Section Chairman, American Institute for the Biological Sciences on Space Biology, Washington, DC
- 1993 Member, Life Sciences Advisory Subcommittee, NASA, Washington, DC

Study Section Member and Chair, Space Biology for the American Institute for the Biological Sciences, Washington, DC

Member, Science Advisory Panel for MIR US-Russian Space Life Sciences Program, Washington, DC

Member, Science Review Panel for State of Kentucky, Space Science Program, Louisville, KY

External Reviewer, American Heart Association National Program

Member, Science Review Panel, Program Review of the Exercise Counter-Measure Program, Extended Duration Orbiter, Johnson Space Center, Houston, TX

1992 Abstract Reviewer, American College of Sports Medicine

Panel Member, National Institutes of Health , NIADDK (International Program) Workshop on Exercise and Midlife, Barcelona, Spain

Regular Study Section Member, NASA Space Biology Program, American Institute for the Biological Sciences, Washington, DC

External Reviewer, Canadian Arthritis Foundation, Toronto, Ontario, Canada

External Reviewer, Canadian Medical Research Council, Vancouver, British Columbia, Canada

External Reviewer, Exercise Countermeasure Study Section, NASA, American Institute for the Biological Sciences, Washington, DC

1991 Ad hoc reviewer, National Science, Education and Research Council, Toronto, Ontario, Canada

Member, Countermeasures review panel for Johnson Space Center, Life Sciences, Houston, TX

Member, NASA-Ames Research Review Group on Musculoskeletal Biomedical Progress, Moffett Field, CA

External Reviewer, American Institute of Space Biology NASA review for musculoskeletal grants, Washington, DC

Member, External Review Panel, National Canadian Arthritis Foundation, Toronto, Ontario, Canada

Member, Musculoskeletal Discipline Working Group, Biomedicine Branch, NASA Headquarters, Washington, DC

Participant, NASA Workshop on the Organization of the National University Consortium for Student Fellowships and Training Grants, Johnson Space Center, Houston, TX

Member, National Institutes of Health Science Advisory Panel on Research and Training in Rehabilitative Medicine, Washington, DC

Abstract reviewer, American College of Sports Medicine National Meeting, Orlando, FL

1990 Ad hoc Reviewer, National Research Council for Post Doctoral Fellowship Programs, NASA, Washington, DC

Committee Member, NASA Workshop for the Development of a National Life Science Data Base and Archival System, Washington, DC

Ad hoc reviewer, National Science Foundation Physiological Processes Study Section Washington DC

Member, Gordon Conference Planning Committee, 1992 Conference on Microgravity Sciences in Space Biology, Washington DC

Reviewer, Johnson Space Center Special Review for Exercise Science Plan and Extended Duration Orbiter, Houston, Texas

Participant, NASA-Ames Musculoskeletal Program Review Workshop, Moffet Field, CA

Member, NASA Musculoskeletal Work Discipline Group, Washington, DC

Special Reviewer, National Science Foundation, Washington, DC

1989 Member, National Institutes of Health Working Group (NIADDK), Musculoskeletal Soft Tissue Inflammation, Bethesda, MD

Special Reviewer, Binational Science Foundation, Israel-USA,  
1988 and 1989

Special Reviewer, National Sciences and Engineering Research  
Council of Canada

Special Reviewer, Medical Research Council of Canada

Elected Member of National Research Council and appointed to the  
Subcommittee for Commercial Developed Space Facility Free Flyer  
for Life Science Microgravity Research, National Academy of Sciences,  
Washington, DC

1987 Special Reviewer, Canadian National Arthritis Institute

1986 Special Reviewer, Life Science Program, NASA, Washington, DC

Special Reviewer, National Institutes of Health (NIADDK),  
Washington, DC, 1982, 1985, 1986

## **JOURNAL REVIEWS**

1982-2002 Reviewed for the following journals:

Cell and Tissue Research  
Connective Tissue Research  
Medicine Science Sports and Exercise  
Journal of Applied Physiology  
Journal of Bone and Joint Surgery  
Journal of Orthopaedic Research  
Pflugers Archives  
Journal Biomechanical Engineering  
Comparative Biochemistry and Physiology  
American Journal of Physiology:  
    Integrative and Regulatory Physiology  
Mechanisms of Aging and Development  
Journal of Gerontology  
Aviation and Environmental Medicine  
Acta Medica Scandinavia  
Scandinavian Journal of Applied Physiology  
International Journal of Sports Medicine  
Journal of Cellular Physiology  
Acta Anatomica  
American Journal of Sports Medicine  
International Journal of Sports Biomechanics  
Journal of Biological Chemistry

American Journal of Clinical Sports Medicine  
Journal of Zoology  
Journal of Biomedical Engineering  
Life Sciences Journal

#### **CHAIRMAN OF SCIENTIFIC SESSIONS**

- 1991 Musculoskeletal Adaptations to Spaceflight Cosmos 2044  
International Conference, Leningrad, USSR
- 1990 Subcommittee Chairperson Extended Duration Orbiter Exercise  
Countermeasure Program Connective Tissue/Biomechanics,  
Johnson Space Center, NASA
- Musculoskeletal Working Group for the Exercise Countermeasure  
Project,  
Johnson Space Center
- Gordon Research Conference "Microgravity Effects on Biological  
Systems: Extracellular Matrix"
- 1989 Musculoskeletal Implementation Group, Extended Duration Orbiter,  
NASA-Johnson Space Center
- 1988 Musculoskeletal Plenary Sessions for Space Biology, COSMOS  
1887 Mission, Moscow Russia
- American College of Sports Medicine National Meeting Symposium  
"Connective Tissues", Dallas, TX
- Orthopaedic Research Society, Musculoskeletal Biology, Atlanta,  
GA
- 1985 American College of Sports Medicine, Connective Tissue Injuries,  
Nashville, TN
- 1984 American College of Sports Medicine, Cardiac Tissue Biochemistry,  
Miami, FL

#### **EXTERNAL REVIEWER FOR UNIVERSITY FACULTY PROMOTIONS**

##### **University of California, San Diego**

- 1994 Promotion Review (Associate Professor) Department of Orthopedics
- 1993 Promotion Review (Full Professor) Department of Orthopaedics

- 1992            Promotion Review (Professor) Department of Orthopaedic Surgery
- 1985            Promotion Review (Associate Professor) Department of Surgery,  
Division of Orthopaedics,

**University of Wisconsin-Madison**

- 1994            Promotion Review (Associate Professor) Department of Veterinary  
Surgical Sciences
- 1993            Promotion Review (Associate Professor) Department of Surgery
- Promotion Review (Associate Clinical Professor) Department of  
Surgery
- Promotion Review (Professor) for Department of Anatomy, School  
of Medicine
- 1992            Promotion Review (Associate Professor) Department of Surgery
- 1989            Promotion Review (Associate Professor) Divisional Biological  
Sciences, Special Review, (ad hoc )

**University of Alabama**

- 1993            Promotion Review (Full Professor) School of Education

**University of Wyoming**

- 1991            Promotion Review (Professor) Department of Physical Education

**University of California - Los Angeles**

- 2001            Promotion Review (Full Professor) Division of Life Sciences,  
Department of Physiological Science
- 1991            Dean Review for Division of Life Sciences
- Promotion Review (Professor) Brain Research Institute

**University of Wyoming**

- 1991            Promotion Review (Associate Professor) Department of Animal  
Sciences

**University of Alberta, Edmonton, Canada**

- 1990            Promotion Review (Associate Professor) Department of Physical  
Therapy and Health Sciences

**Southwest Texas State University**

1988 Promotion Review (Associate Professor) Department of Physical Education

**University of New Hampshire**

1986 Promotion Review (Professor) School of Health Studies

**STATEWIDE SERVICE**

2002 Appointed to the Governor's Council - Texas Council on Environmental Technology

2002 Houston Area Gigapop Board Member on Information Technology

2001 Texas Research University Forum

Texas Gulf Coast Research Consortium

1995-2001 Texas Research University for Research Administration

1995-2001 Texas Space Grant Consortium

1995-1997 Texas Council on Graduate Education

1995-2001 Texas Coordination Board Research Administrative Advisory Panel

**UNIVERSITY COUNCILS AND COMMITTEES**

**University of Houston System/University of Houston**

President's Council

Provost Council

Chancellor's System Administrative Council

Graduate Studies Council

Animal Care and Use Committee

Intellectual Property Committee

Radiation Safety and Use Committee

University Facilities and Planning Committee

Deans Council

Research Council

Academic Program Reviews

Centers and Institutes Reviews

Houston Area Research Center Committee

Search Committee Chair for Vice Chancellor/Vice President of  
Institutional Advancement

### **University of Wisconsin-Madison**

University Campus Human Subjects Review Board

University Campus Committee on Federal Initiatives

Department Coordinator Graduate Studies

Chair of School of Education Human Subjects Committee

Department Chair of Kinesiology

Associate Dean for Research and Development

Department Chairman Human Use Committee

Department Chairman of Financial Aids Committee

Assistant Professor Review Committee

Board Member of Sports Medicine Program

Board Member of Research Committee for Institute on  
Aging

Department Facilities Committee

Chairman of Department Facilities Committee

Chairman for Department Undergraduate Studies  
Committee

Member of the University of Wisconsin Heart Institute

Department Coordinator for Undergraduate Studies

Department Coordinator of Graduate Studies

Chairman of Graduate Studies Committee

School of Education Equity Action Committee

School of Education Facilities Committee

School of Education Academic Planning Council

School of Education Administrative Council

Department Future Directions Committee

Department Assistant Professor Review Committee

Chairman of Department Equity Action Committee

Chairman of Department Human Subjects Research  
Committee

Chairman of Three Faculty Searches in Biodynamics

Search Committee member for Faculty position in  
Biomechanics

Department Merit Committee

Department Committee Member of Faculty Promotion

Department Executive Committee Member

### **University of California-Los Angeles**

Resource Committee

Search Committee for Departmental Engineer

Undergraduate Affairs Committee

Physiology Search Committee (4 faculty positions)

Life Science Planning Committee

Departmental Representative to the Committee on Non-Mammalian Use

Organizer of Departmental Program Project, "Instrument Program Grant, Sponsored by Department of Defense"

Organized Departmental Symposium, "Aging and Exercise"

Departmental Representative to Planning Committee for the UCLA Sports Medicine Center

UCLA Stress Fracture Study, Board Member

## **CONSULTING SERVICES**

### **Industry/Business**

1991 Marion-Merrill Dow, Inc. Kansas City, MO

Genentec Corporation, San Francisco, CA

Westover Consultants, Washington, DC

1990 KRUG International, Houston Texas

Lockheed Corporation, Houston Texas

Genentec Corporation, San Francisco, CA

1989 Consultant for Waters Associates, Millipore Corporation, Milford, MA

Genentec Corporation, San Francisco, CA

1988 LUNAR Corporation, Madison, WI

Zetachron Corporation, State College, PA

1987 Somax Corporation, San Rafael, CA

1980 Cardiac Pacemakers (Fibrotic Tissue Control), St. Paul, MN

### **Hospitals/Clinics/Health Care**

1991 Mayo Clinic, Department of Anesthesiology, Rochester, MN

Manchester Sports Medicine Clinic, Manchester, NH

Fitness Network, Manchester, NH

Hines VA Hospital, Hines, IL

Biological Imaging, Madison, WI

Applied Physiological Associates, Madison, WI

1984-1986      Coutts Institute for Joint Reconstruction and Research,  
San Diego, CA

### **Associations/Government Agencies**

1995-96      University Space Research Association, Houston, TX

1993          University Space Research Association, Houston, TX

1991          University Space Research Association, Houston, TX

1987          NASA-Ames Space Center Biomedical Research Division, Moffet Field,  
CA

1986          Naval Health and Research Center, (Exercise Induced Tibial Stress  
Fractures), San Diego Naval Base, San Diego, CA

### **Universities**

1991          Center for Cell Research, Pennsylvania State University,  
University Park, PA

1988          Pennsylvania State University Space Center, Center for Cell Research,  
University Park, PA

1988          Gerontology Institute, University of Wisconsin-Madison, Madison, WI

## **TEACHING EXPERIENCE**

### **University of California-Los Angeles**

#### **Courses Instructed**

Basic Concepts Associated with the Adaptive Process of Mineralized  
Tissues (K112), Upper Division Undergraduate course, 20 Students  
The Physiology of Connective Tissues (K290), Graduate course, 15  
Students

Adaptation of Structural Proteins to Mechanical Stresses (K206),  
Graduate course, 10 Students

Human Physiology (K101), Lower Division Undergraduate Course, 350  
Students, also course coordinator

### **Student Advising**

Ph.D. Advisor (7 students)

Principal Advisor for 20 undergraduate independent projects

Ph.D. Thesis Committee member (14 students)

Ph.D. Extra-Departmental Committee member (6 students, Biology  
Department)

Master Thesis Committee member (18 students)

Ph.D. Comprehensive Exam Committee member (15 students)

Masters Comprehensive Exam Committee member (18 students)

Principal Advisor for Master's Degree candidates (10 students)

Principal Advisor for 11 Undergraduate Honors Students

### **University of Wisconsin-Madison**

#### **Courses Instructed**

Biology of Exercise 742-614

Biodynamics Seminar Series 742-990

#### **Instructional Programs**

Advisor to Pre-Doctoral Training Grant for Minorities in Space Biology,  
1988-1990.

Advisor to Undergraduate Exchange Program with Chicago State  
University (Melvin McFarland) in Biodynamics and Biology, 1990.

Supervisor of Biodynamics Laboratory High School Exchange Summer  
Program for Minority Students (Biodynamics Lab Staff), 1990-1992.

School of Education Coordinator for Biodiversity and Environmental Studies for Minority Students

### **Post Doctoral Training Programs**

Dr. Thomas P. Martin, 1982-85, Department of Kinesiology, University of California. He is an Assistant Professor in Departments of Physiology and Physiotherapy, University of Alberta. He recently received the Heritage Foundation Fellowship.

Research Fellow Department of Surgery Dr. John Aygot Denmark working with Connective Tissue Alterations in Prostate Hypertrophy, University of Wisconsin, 1990.

Visiting Scientist, Dr. Petrit Begoli, Department of Orthopaedic Surgery, University of Prishtina, Prishtina, Yugoslavia, 1991-1992.

Research Scientist, Dr. Eli Gendloff, Department of Kinesiology, University of Wisconsin-Madison, 1992-1994.

### **University of Houston**

#### **Courses Instructed**

Special Topics in Molecular and Cellular Biology, 6001

#### **Instructional Programs**

NSF- Lewis Stokes Allied Minority Undergraduate Program for Math, Science, Technology and Engineering

#### **Principal Thesis Advisor**

James Matsuda, M.S. Physiological Science  
Lisa Lewis, M.S. Physiological Science  
Daniel Martinez, M.S. Physiological Science  
Naomi Kimura, M.S. Physiological Science  
Madeline Murguia, M.S. Physiological Science  
Mercedes Russell, M.S. Physiological Science  
Sandra Curwin, Ph.D. Physiological Science  
Greg Rebella, M.S. Biodynamics  
Tiffany Rench, M.S. Biodynamics  
Cheryl Railing, M.S. Biodynamics

Valerie Choy, M.S. Biodynamics  
 Laura Liedtke, M.S. Biodynamics  
 Judith Bautch, Ph.D. Biodynamics  
 John McCarthy Ph.D. Biodynamics  
 Polly Hansen Ph.D. Biodynamics  
 Patty Griffith M.S. Biodynamics  
 Kathy McCormick Ph.D. Biodynamics  
 Luc Gosselin Ph.D. Biodynamics  
 Daniel Martinez Ph.D. Biodynamics  
 David Guhl, M.S. Biodynamics  
 Jane Daun, M.S. Biodynamics

## **RESEARCH**

### **Invited Presentations**

#### **National**

- 2002            Research Frontiers in Engineering Technology, “Research and Its Importance to Teaching , Economic Development and Human Resource Development”, South Shore Harbor Hotel, Houston Texas
- 1999            Shell Foundation, “Presentation on University Partnerships that Promote Multidisciplinary Research and Instructional Programs” Houston Texas
- Houston Texas Role in Promoting Minority Undergraduate Programs for Science, Technology, Math and Engineering: A Proposal to the National Science Foundation, Washington DC
- Graduate and Research Consortia for the Urban Research Universities, New Orleans, LA
- 1996            University Industrial Consortia: A Way to Advance Technology Transfer, Conroe, TX
- 1995            Biology of Collagen and Its Importance to the Repair Process, New Hampshire Musculoskeletal Institute
- How a Lunar Mission can be used for Educational Purposes? Workshop on Aviation-Space Science Education, Oshkosh, WI
- 1994            Connective Tissue Plasticity , Gordon Conference: Microgravity and Living Systems, New London, NH

- Signal Transduction Pathways that Impact Bone Formation, University of Rochester
- 1993 Musculoskeletal Plasticity During Weightlessness, Annual Meeting on Gravitational Biology, Washington, DC
- A Strategic Plan for Integration in Orthopaedic Science, Dartmouth Medical School
- Resorption of Collagen in Primates Exposed to Weightlessness, Report of COSMOS Results, Ames Research Center
- 1992 Use of Non-Invasive Markers to Study Man in Microgravity-Johnson Space Center, Houston, TX
- Collagen and Muscle Structure, American Society on Gravitational Biology, Tucson, AZ
- Gravity and Its Role on Skeletal Structure, Gordon Conference on Gravity and Its Effects on Living Systems, Proctor Academy, Andover, NH
- 1991 A Theory of Connective Tissue Adaptation, Dartmouth College School of Medicine, Division of Orthopaedics
- Connective Tissue and Aging (Symposium Soft Tissue) American College of Sports Medicine, Orlando, FL
- Connective Tissue Adaptation in Man, Texas Physical Education Association Meeting, San Marcos, TX
- Connective Tissue Adaptation in Weightlessness; Symposium in San Marcos, TX
- A Model for Connective Tissue Plasticity, Department of Anesthesiology, Mayo Clinic, Rochester, MN
- Bone Adaptation to Spaceflight, Departments of Biology and Health Sciences, American University, Washington, DC
- Ligament Junction Modifications During Hindlimb Unweighting, NASA Ames Research Center, Moffett Field, CA
- Cortical Bone Adaptation in Growing Animals During Weightlessness, Department of Human Kinetics, University of Wisconsin-Milwaukee

Future Directions in Space Biology: An Emphasis of the  
Musculoskeletal Discipline, University Space Research Association,  
Johnson Space Center, Houston, TX

1990 The Use of Plasma Markers to Assess Connective Tissue Degradation in  
Exercising Humans, University of Southwest Texas, San Marcos,  
Department of Physical Therapy

Basic Concepts Associated with Connective Tissue Adaptation, National  
Conference on Microgravity, NASA-Ames

Connective Tissue Adaptation to Spaceflight, Gordon Research  
Conference on Microgravity Effects on Biosystems  
Why are the Life Sciences Interested in the Space Program, University  
of Wyoming Centennial Lecture Series

The Adaptation of Bone in Man to Physical Activity, University of  
Wyoming School of Health Studies

Effects of Space Flight on Bone Growth, Chicago State University,  
Department of Biology

Bioseparation Technology Applied to Connective Tissue Studies in  
Space Lab and Free Flyers, Millipore Corporation, Milford, MA

1989 Adaptive Properties Associated with Growth Hormone Action in Dense  
Fibrous Connective Tissues, Genentec Inc., San Francisco, CA

Plasma Markers for Monitoring Skeletal Degradation in Space Flight,  
Johnson Space Center, Houston, TX

Collagen Crosslink Residues: Possible Serum Markers for Skeletal  
Turnover, Naval Health Research Center, San Diego, CA

Suspension Effects on Morphological and Mechanical Properties of the  
Bone Ligament Junction, American College of Sports Medicine,  
Baltimore, MD

Physiological Basis of Overtraining, National Institutes of Health  
Workshop (NADIKK), Bethesda, MD

The Aging of Tendon, University of Michigan, Institute of Aging, Ann  
Arbor, MI

Reasons for Life Science Access to Microgravity, National Research Council, Beckman Center, Irvine, CA

Bone Maturation Modified by Pituitary Hormone Action, Center for Cell Research, Pennsylvania State University, PA

1988 Aging Process of Tendons, Department of Physiology, University of Texas, San Antonio, TX

Quantification of Cortical Bone Response in Man, Southwest Texas State University, San Marcos, TX

Cortical Bone Response to Spaceflight, Cell Institute, Pennsylvania State University, PA

Aging of the Tendon Matrix, Department of Physiology, Osteopathic School of Medicine, Fort Worth, TX

Modification of Cortical Bone Growth and Maturation by Zero Gravity, Brooks Air Force Base Environmental Institute, San Antonio, TX

American College of Sports Medicine Annual Meeting, "Cartilage Adaptation to Exercise", Dallas, TX

1987 Texas College of Osteopathic Medicine, "Adaptation of Mineralized Tissues to Exercise", Fort Worth, TX

American College of Sports Medicine, Southwest Chapter, "Structural Characteristics of Connective Tissue Matrix Components Associated with Adaptation to Prolonged Exercise", Las Vegas, NV

American College of Sports Medicine Annual Meeting, Colloquia, "Adaptive Process of Mineralized Tissue to Exercise", Las Vegas, NV

Distinguished Scientist Lecture, Current Controversies in Clinical Physical Therapy, "Cartilage Maturation and Adaptation to Physical Stresses: Clinical Potential", California State Long Beach, Physical Therapy Program, Long Beach, CA

Division of Orthopaedics Lecture Series, "Bone Adaptation to High Intensity Exercise During Skeletal Growth and Maturation", Department of Surgery, University of California, Irvine, CA

Department of the Navy, "Exercise Induced Stress Fractures", Naval Health Research Center, San Diego, CA

- 1986 Naval Health Research Center, "Intense Physical Training and Its Influence on the Bone Matrix", San Diego, CA
- NASA-Ames Bone and Connective Tissue Workshop, "Bone Results from Space Shuttle Mission SL-3", Moffett Field, CA
- 1985 American College of Sports Medicine National Meeting, Colloquia, "The Effects of Exercise on Dense Fibrous Connective Tissues", Nashville, TN
- National Physiotherapy Sports Medicine Conference, "A Review of Ligament Adaptation to Altered Load Environments", Anaheim, CA
- NASA Ames Research Center, Division of Musculoskeletal Research, "Bone and Tendon Alterations to Prolonged Suspension", Moffett Field, CA
- University of Texas, Departments of Physical Education and Pharmacology, "The Aging Process of Bone in Fisher 344 Rats", Austin, TX
- University of Southern California, Department of Physiotherapy, "Biology of the Repair Process in Ligaments", Los Angeles, CA
- 1984 University of New Hampshire, School of Health Science, "Exercise and the Aging Process of Tendons", Durham, NH
- Coutts Institute for Joint Reconstruction and Research, "Bone and Tendon Alterations to Cordotomy", San Diego, CA
- Annual National Conference on Engineering in Medicine and Biology, "Relationships Between the Matrix and Biomechanical Properties of Ligaments", Los Angeles, CA
- 1983 Department of Orthopaedics, "Heterogeneity of Meniscus", University of California, La Jolla, CA
- 1980 University of New Hampshire, "Ligament and Tendon Characteristics of Lower Primates", Department of Zoology, Durham, NH
- Cardiac Pacemakers, "Factors Regulating Connective Tissue Proliferation", St. Paul, MN
- 1978 Hahneman Medical College and Hospital, "Animal Models Used for Studying Hypertension", Philadelphia, PA

## International Meetings

- 1998 University of Mexico Council on Science and Technology, Graduate Exchange Programs in Science and Engineering
- 1997 French Space Agency, Musculoskeletal Adaptation to Microgravity, Toulouse, France
- 1996 Relationships Between Industries and Universities, Center for Physics, Chemistry and Engineering, Lyon, France
- 1994 Frequency and Amplitude Modulation for Musculoskeletal Growth and Development, Department of Physiology, University of Colima, Colima, Mexico
- Space Sciences and Its Impact on Biodiversity Mission for Children, University of Guadalajara, Jalisco, Mexico
- 1993 NASA Life Sciences: A Resource for Science Education for Children, University of Colima, Colima, Mexico
- 1992 Exercise and Connective Tissue Adaptation, World Conference on Exercise, Health and Physical Fitness, Toronto, Canada
- Connective Tissue Adaptation to Space Flight, World Congress on Space Sciences, COSPAR, Washington, DC
- Bone Adaptation to Exercise in Adults, International Conference in Barcelona, Spain, Sponsored by the NIH and Generalitat of Catalunya
- 1991 Humeral Bone Adaptation to Spaceflight: Cosmos 2044 Mission, Leningrad, USSR
- 1990 The Biology of Connective Tissue Adaptation, Microgravity Symposium, NASA-Ames, Moffett Field, CA
- 1988 Quaker Conference on Youth, Exercise and Sport, "Exercise Effects on Ligaments, Tendons and Bones", Bermuda
- 1987 National Aeronautics and Space Administration Live Science Symposium, "Acute Adaptation of Connective Tissue to Weightlessness", Washington, DC
- 1986 Twenty-Sixth Plenary Meeting of the Committee on Space Research, "Evidence for Suppression of Bone Growth and Maturation During Short-Term Space Flight", Toulouse, France

- 1985 University of Montreal, Departments of Physical Education and Physiology, "Exercise Suppression of Bone Growth and Maturation", Montreal, Quebec, Canada
- 1983 University of Guelph, College of Biological Sciences, "Metabolic Characteristics of Soft Dense Fibrous Connective Tissues", Guelph, Ontario, Canada
- 1982 National Canadian Physiotherapy Association, "Biology of the Tendon Matrix", Vancouver, British Columbia, Canada
- 1980 National Canadian Physiotherapy Association, "The Effects of Exercise on the Repair Process of Ligaments", Halifax, Nova Scotia, Canada

### **University of Houston**

- 2002 Department of Mechanical Engineering, "Mechanical Basis for Connective Tissue Adaptation"
- 2002 Hellenic Professional Society, Economic Impact of Universities, Houston, Tx
- 2002 Economic Development and Nanotechnology: Forum for Houston's Future, Houston, Tx
- 2001 University of Houston Community of Scholars, Research Impact on Undergraduate Teaching, Houston, Tx
- 1999 University of Houston Educational Opportunities in Oil Producing Countries that will Enhance International Programs: High Demand
- University of Mexico Council on Science and Technology, Graduate Exchange
- Technology Development in Material Science at the University of Houston
- 1998 Grantsmanship and Its Importance to Improving the Academic Quality of Programs
- Technology Management Programs in Research Universities of Texas
- 1997 University of Houston and Role in the Exploration and Production of Oil

Texas Association of Graduate Schools, Role of Research in Undergraduate Education

Introduction to Collagen and Non Collagen Macromolecules: Impact on Material Properties

NAFTA and the Opportunities for Research and Technology Exchange

Concept of the Technology Transfer Virtual Incubator, NASA JSC

NASA-UH Virtual Incubator Program in Technology Transfer

### **University of Wisconsin**

- 1994           Space Life Sciences Program for Observation on Earth and Ocean Systems, Biodiversity Program and Institute on Environmental Education
- Space Science and Education, Keynote Speaker, School of Education Alumni Week
- Clinical Applications for Unique Biomarkers of Musculoskeletal Tissue Degradation, Department of Surgery Educational Series
- 1991           The Effects of Growth Hormone on Bone Maturation, Department of Orthopaedic Surgery Scholar Lecture Series
- Muscle Connective Tissue Department of Muscle Biology
- 1990           Effects of Strenuous Exercise on Meniscus Growth, Department of Orthopaedic Surgery Scholar Lecture Series
- 1989           Muscle Connective Tissue, Muscle Biology Institute
- Space Flight and Its Effects on Cortical Bone Mineralization, Department of Nutritional Sciences
- Adaptation of Meniscus to Exercise, Division of Orthopaedic Surgery Visiting Scholar

Cortical Bone Response to Acute Microgravity Exposure, Animal Sciences

1988

Exercise Effects on Cortical Bone Remodeling, Orthopaedics Department

Bone Response to Exercise in Man, Department of Physical Education

University of Wisconsin, Department of Orthopaedics, "Effects of Exercise on Ligament and Tendon Growth and Repair"  
Muscular Activity and Bone Growth, Department of Poultry Science

Exercise and the Aging Process, Biogerontology Institute

### **Principal Investigator of National Grants Funded**

- 2001-2002 NASA, Principal Investigator, "Texas Learning and Computational Center", \$3,600,000
- 2001-2002 NASA, Principal Investigator, "Urinary Markers of Collagen Metabolism in Primates During 2G" \$12,500
- 1999-2002 NASA, Co-Principal Investigator, "Healing Responses of Knee Ligaments of Rodents During Limb Unweighting" \$799,914
- 1998-2002 NASA, Principal Investigator, "UH-NASA Incubator for Technology Development" \$1,156,786
- 1996-1998 NASA, Principal Investigator, BION-11 and BION-12 "Markers of Connective Tissue Metabolism During Space Flight" \$209,000
- 1993-1994 Navy, Principal Investigator, "Connective Tissue Degradation on Eccentric Training", \$40,000
- 1993-1994 NASA, Principal Investigator, "Space Life Sciences-2 Mission on Bone Growth and Development", \$60,000
- 1992-1997 NASA, Principal Investigator, "Markers of Connective Tissue Metabolism in Primates", \$250,000
- 1991-1992 Department of Defense, Principal Investigator, "Markers of Musculoskeletal Degradation During Exercise Training in Heat Stress", \$95,000

1991-1994	NASA, Principal Investigator, "Soft Dense Fibrous Connective Tissue Transitions During Hindlimb Unweighting" \$300,000
1991-1994	NASA, Principal Investigator, "Bone Metabolism During Weightlessness", \$240,000
1990-1991	U.S. Olympic Committee Student Fellowship Program, Principal Investigator, \$15,000
1989-1990	NASA, Principal Investigator, "Pre-doctoral Minority Training Grant" \$56,000
1990-1991	National Arthritis Foundation, Principal Investigator, "Exercise Effects on Cartilage Degradation" \$10,000
1988-1990	NASA, Principal Investigator, "Preliminary Studies for Determining Collagen Secretion and Maturation During Recovery from Microgravity" \$36,000
1989-1991	NASA, Principal Investigator, "14 Day Spaceflight, Connective Tissue Structure and Function" \$80,000
1989-1991	NASA, Principal Investigator, "Soft Dense Fibrous Connective Tissue Response, Supplement", \$122,000
1988-1991	Department of the Navy, Program Project Director and Principal Investigator, "Etiology of Tibial Stress Fractures Associated With Strenuous Exercise", \$210,000
1987-1991	NASA, Principal Investigator, "Soft Dense Fibrous Connective Tissue Adaptation to Prolonged Suspension", \$195,864
1987-1988	NASA, Principal Investigator, "Connective Tissue Studies in Rats Exposed to 14 Days of Space Flight, Cosmos Mission", \$35,000
1987-1988	NASA, Principal Investigator, "Cosmos Pilot Studies on Ground Base Control Animals", \$5,000
1986-1987	NASA, Principal Investigator, "Bone Growth and Maturation Studies in Rats Exposed to Short-Term Space Flight", \$10,000
1986-1987	Department of Defense Naval Research and Health Center, Principal Investigator, "Connective Tissue Degradation Markers in Plasma of Human Subjects Exposed to Severe Exercise Protocols for Naval Special

Forces Training Program: A Possible Association to Tibial Stress Fractures", \$10,000

1984-1987 NASA, Principal Investigator, "Bone and Tendon Characteristics in Rats Exposed to Prolonged Hindlimb Suspension", \$189,000

1982-1986 NIH, Principal Investigator (subcontract), "Effects of Strenuous Exercise on Long Bone Growth", \$162,000

### **State Grant**

1999-2003 State of Texas Special Item, Principal Investigator, "University of Houston Learning and Computation Center", \$8,400,000

## **STUDENT FELLOWSHIPS FUNDED**

### **Undergraduate**

1990 Principal Investigator, Minority Student Fellowship Co-op Program with Chicago State University and the University of Chicago, \$8,000

### **Graduate**

1991-1992 Principal Investigator, U.S. Olympic Committee Graduate Student Fellowship, \$15,000

1990 Principal Investigator, U.S. Olympic Committee Graduate Fellowship Program, \$15,000

Principal Investigator, National Arthritis Pre-doctoral Fellowship, \$10,000

1987-1990.1 Principal Investigator, NASA Graduate Student Fellowship, \$51,000

### **Federal Support Projects Received**

1999 Allied Minority Participation, National Science Foundation, Undergraduate Programs for Science, Math, Engineering and Technology, \$3,800,000/5yrs

2000 Environmental Protection Agency, Houston Ozone Modeling, \$2,000,000/2 yrs

2001 Environmental Protection Agency, Environmental Modeling for the Gulf Coast Region, \$3,500,000/2yrs

2003

Department of Justice, Technology for Law Enforcement Vehicles  
\$1,000,000

## PUBLICATIONS

### A. Refereed Journals

Martinez, D.A., R.E. Grindeland, K.Dave-Coombs, A.K. Lee, H-Y. Hoang, P. Le, R. Vanderby, Jr. and A.C. Vailas. Temporal biochemical and molecular extracellular matrix adaptations in the MCL during wound healing and hindlimb unloading. *American Journal Physiology*, (in preparation, 2003).

Martinez, D.A., P.E. Buckendahl, R.E. Grindeland, R. Dotsenko, A.J. Bigbee, and A.C. Vailas. Evaluation of bone and collagen metabolism in the Bion 10 & 11 space program by assessing urinary biomarkers in non-human primates. *American Journal of Physiology*, (in preparation, 2003).

Martinez, D.A., K.M. Shea, P.E. Buckendahl, R.E. Grindeland, R. Dotsenko, A.J. Bigbee, and A.C. Vailas. The impact of 14 days of 2G hypergravity on mineralized and non-mineralized connective tissue metabolism in non-human primates by urinary biomarker analysis. *Journal of Gravitational Physiology*, (in preparation, 2003).

Choy, V.E., A. Kyparos, D.A. Martinez, T.C. Crenshaw and A.C. Vailas. The biphasic response of porcine tendon to recombinant porcine somatotropin. *Journal of Applied Physiology* (in preparation, 2003)

Provenciano, P.P., D.A. Martinez, R.E. Grindeland, A.C. Vailas, and R. Vanderby Jr. Systemic administration of insulin-like growth factor-I and growth hormone enhances healing of collagen extracellular matrix: Evaluation of ligament from loaded and unloaded rat hindlimbs. (submitted, *Journal of Applied Physiology* 2003.)

Martinez, D.A., A.C. Vailas and L.E. Gosselin. Collagen remodeling in skeletal muscles induced by growth hormone in the dwarf rat. *Muscle and Nerve* (submitted 2002).

Provenciano, P.P., D.A. Martinez, R.E. Grindeland, K.W. Dwyer, J. Turner, A.C. Vailas and R. Vanderby Jr. Hindlimb unloading alters ligament healing. *Journal of Applied Physiology* 94:314-324, 2003.

Martinez, D.A., D.J. Guhl, W.C. Stanley, and A.C. Vailas. Extracellular matrix maturation stable in the left ventricle of the normal and diabetic swine. *Diabetes Research and Clinical Practice* 59: 1-9, 2003.

Kyparos, A., M.W. Orth, A.C. Vailas and D.A. Martinez. Growth and maturational changes in dense fibrous connective tissue following 14 days of rhGH supplementation in the dwarf rat. *Growth Hormone IGF Research* 12: 367-373, 2002.

Martinez, D.A., P.E. Buckendahl, R.E. Grindeland, M.A. Dotsenko, A.J. Bigbee and A.C. Vailas. Evaluation of bone and collagen metabolism by assessing urinary biomarkers in non-human primates. *Journal of Gravitational Physiology* 7:S169-S170, 2000.

Martinez, D.A., M.W. Orth, K.E. Carr, R. Vanderby Jr., M. Vasques, R.E. Grindeland and A.C. Vailas. Cortical bone response to acute 2G hypergravity in growing rats. *Aviation Space Environmental Medicine* 69: A17-A22, 1998.

Kohles, S.S., D.A. Martinez, J.R. Bowers, A.C. Vailas and R. Vanderby Jr. Effect of a growth hormone treatment on bone orthotropic elasticity in dwarf rats. *Annals Biomedical Engineering* 25(1): 77-85, 1997.

Bautch, J.C., D.G. Malone and A.C. Vailas. Effects of exercise on knee joints with osteoarthritis: A pilot study for biological markers. *Arthritis Care and Research*, 10: 48-55, 1997

Kohles, S.S., J.R. Bowers, A.C. Vailas and R. Vanderby Jr. Ultrasonic wave velocity measurements in small polymeric and cortical bone specimens. *Journal of Biomechanical Engineering* 119(3): 232-236, 1997.

Martinez, D.A., M.W. Orth, K.E. Carr, R. Vanderby Jr. and A.C. Vailas. Cortical bone growth and maturation in the dwarf rat model induced by recombinant human growth hormone (rhGH). *American Journal of Physiology (Endocrinol. Metab.)* 270: E290-E302, 1996.

Cahoon S., S.D. Boden, K.G. Gould and A.C. Vailas. Noninvasive markers of bone metabolism in rhesus monkey - Normal effects of age and gender. *Journal of Medical Primatology* 25(5): 333-338, 1996.

Kohles, S.S., J.R. Bowers, A.C. Vailas, R. Vanderby Jr. Effects of a hypergravity environment on cortical bone elasticity in rats. *Calcified Tissue International* 59: 214-217, 1996.

Hayashi, K, G. R. Thabit, A.C. Vailas, J.J. Bordanske, A.J. Cooley, and M.D. Markel. The effect of nonablative laser energy on joint capsular properties. An *in vitro* histologic and biochemical study using a rabbit model. *American Journal of Sports Medicine* 24: 640-646, 1996.

- Vanderby Jr. R., C.T. Chen and A.C. Vailas. Effect of collagen cross-links on the quarter staggered molecular structure of fiber forming collagen: A finite element analysis. *Biomimetics* 3: 91-104, 1995.
- Gosselin, L.E., G.C. Sieck, R.A. Aleff, D.A. Martinez and A.C. Vailas. Changes in diaphragm muscle collagen gene expression after acute unilateral denervation. *Journal of Applied Physiology* 79: 1249-1254, 1995.
- McCarthy, J.P., J.C. Agre, B.K. Graf, M.A. Pozniak and A.C. Vailas. Compatibility of adaptive responses with combining strength and endurance training. *Medicine Science Sports and Exercise* 27: 429-436, 1995.
- Maynard, J.A., A. Pedrini-Mille, V.A. Pedrini and A.C. Vailas. Morphological and biochemical effects of strenuous exercise on immature long bones. *Iowa Orthopedic Journal* 15: 162-167, 1995.
- Curwin, S.L., R.R. Roy and A.C. Vailas. Regional and age variations in growing tendon. *Journal of Morphology*, 221:309-320, 1994.
- Hurschler, C. Vanderby, R., Martinez, D.A., Vailas, A.C. and Turnipseed, W.D. Mechanical and biochemical analysis of tibial compartment fascia in chronic compartment syndrome. *Annals of Biomedical Engineering*, 22:272-279, 1994.
- Orth, M. W., R.M. Leach, A.C. Vailas and M.E. Cook. Non reducible collagen crosslinks in cartilage from broiler chickens with tibial dyschondroplasia. *Avian Disorders* 38:44-49, 1994.
- Gosselin, L.E., Martinez, D.A., Vailas, A.C. and Sieck, G.C. Passive length-force properties of the senescent diaphragm: relationship to collagen characteristics. *Journal of Applied Physiology*, 76:2680-2685, 1994.
- Orth, M.W., D.A. Martinez, M.E. Cook and A.C. Vailas. The presence of lysylpyridinoline in the hypertrophic cartilage of newly hatched chicks. *Biochemistry Biophysics Acta*, 1157:229-232, 1993.
- Salem, G.J., R.F. Zernicke, D.A. Martinez and A.C. Vailas. Adaptations of immature trabecular bone to moderate exercise: geometrical, biochemical and biomechanical correlation. *Bone* 14:647-654, 1993.

Gosselin, L.E., D.A. Martinez, A.C. Vailas and G.C. Sieck. Interstitial space and collagen alterations of the developing rat diaphragm. *Journal of Applied Physiology*, 74:2450-2455, 1993.

Graf, B.K., K. Fujiski, R. Vanderby and A.C. Vailas. Effect of insitu freezing on rabbit patellar tendon: A histological, biochemical and biomechanical analysis. *American Journal of Sports Medicine*, 20:401-405, 1992.

Gosselin, L.E., M.B. Betlach, A.C. Vailas and D.P. Thomas. Training induced alterations in young and senescent rat diaphragm muscle. *Journal of Applied Physiology*, 72:1506-1511, 1992.

Gosselin, L., M. Betlach, A. Vailas, M. Greaser and P. Thomas. Myosin heavy chain isoforms of young and senescent rat diaphragm: effect of exercise training *Journal of Applied Physiology*, 73:1282-1286, 1992.

Vailas, A.C., R. Vanderby, D.A. Martinez, R.B. Ashman, M.J. Ulm, R.E. Grindeland, G.N. Durnova and A. Kaplansky. Humerus bone adaptation to spaceflight in the adult rat. *Journal of Applied Physiology*, 73:4-9, 1992.

Orth, M.W., D.A. Martinez, M.E. Cook and A.C. Vailas. Non-reducible crosslink formation in tibial dyschondroplastic growth plate cartilage from broiler chicks fed homcysteine. *Biochemical and Biophysical Research Communications*, 179: 1582-1586, 1991.

Martinez, D.A., A.C. Vailas and R.E. Grindeland. Cortical bone maturation in young hypophysectomized rats. *American Journal of Physiology*, 260: E690-E694, 1991.

Zernicke, R.F., J.C. Hou, A.C. Vailas, M. Nashimoto, S. Patel, and S.R. Shaw. Changes in geometrical and biomechanical properties immature male and female rat tibia. *Aviation Space and Environmental Medicine*, 61:814-820, 1990.

Martin, T.P, L.A. Gundersen, A.C. Vailas, V.R. Edgerton and S.K.Das. Incomplete normalization of dog gracilis muscle grafts with neurovascular repair despite long-term recovery. *Journal of Applied Physiology*, 68:687-692, 1990.

Vanderby, R., A.C. Vailas, B.K. Graf, R.J. Thielke, M.J. Ulm, S.S. Kohles and D.N. Kunz. Acute modification of biomechanical properties of ligament-bone insertion to rat limb unweighting. *FASEB Journal*, 4:2499-2505, 1990.

Zernicke, R.F., A.C. Vailas, R.E. Grindeland, A. Kaplansky, G.N. Durnova, G.J. Salem and D.A. Martinez. Spaceflight effects on biomechanical and biochemical properties of vertebrae in rapidly growing rats. *American Journal of Physiology*, 258:R1327-R1332, 1990.

Zernicke, R.F., A.C. Vailas, R.E. Grindeland, K.C. Li, and G.J. Salem. Interactive effects of nutrition, environment, and rat-strain on cortical and vertebral bone geometry and biomechanics. *Aviation, Space and Environmental Medicine*, 61:640-647, 1990.

Vailas, A.C., R.F. Zernicke, R.E. Grindeland, and K.C. Li. Suspension effects on rat femur-medial collateral ligament-tibia unit. *American Journal of Physiology*, 258:R724-R728, 1990.

Vailas, A.C., R.F. Zernicke, R.E. Grindeland, A. Kaplansky, G.N. Durnova, K.C. Li and D.A. Martinez. Effects of spaceflight on rat humerus geometry biomechanics and biochemistry. *FASEB Journal* 4:47-54, 1990.

Salem, G.S., R.F. Zernicke, A.C. Vailas, and D.A. Martinez. Biomechanical and biochemical changes in lumbar vertebrae of rapidly growing rats. *American Journal of Physiology*, 256:R259-R256, 1989.

Loitz, B., R.F. Zernicke, R. Meals, and A.C. Vailas. Effects of continuous passive motion on isolated tendon properties. *Clinical Orthopedics and Related Research*, 244:265-271, 1989.

Curwin, S.C., A.C. Vailas, and J.B. Wood. Immature tendon adaptation to strenuous exercise. *Journal of Applied Physiology*, 65:2297-2301, 1988.

Murguia, M.J., A.C. Vailas, B.R. Mandelbaum, J. Norton, J. Hodgdon, H. Goforth, and M. Riedy. Plasma hydroxyproline: a possible predictive marker for connective tissue-related injuries. *American Journal of Sports Medicine*, 16:660-664, 1988.

Vailas, A.C., D. Deluna, L.L. Lewis, S.C. Curwin, R.R. Roy, and E.E. Alford. Adaptation of bone and tendon to prolonged hindlimb suspension. *Journal of Applied Physiology*, 65:373-376, 1988.

Shaw, S.R., A.C. Vailas, R.E. Grindeland, and R.F. Zernicke. Effects of one-week space flight on the morphological and mechanical properties of growing bone. *American Journal of Physiology*, 254:R78-R83, 1988.

- Pedrini-Mille, A., V.A. Pedrini, J.A. Maynard, and A.C. Vailas. Meniscus response of immature chickens to strenuous exercise: biochemical studies. *Journal of Orthopedic Research*, 6:196-204, 1988.
- Tipton, C.M., A.C. Vailas, and R.D. Matthes. Experimental studies on the influences of physical activity in ligaments, tendons and joints. *Acta Medica Scandinavia*. (Suppl.) 711:157-168, 1987.
- Shaw, S.R., R.F. Zernicke, A.C. Vailas, D. Deluna, D.B. Thomason, and K.M. Baldwin. Mechanical, morphological and biochemical adaptations of bone to hindlimb suspension and exercise. *Journal of Biomechanics*, 20:225-234, 1987.
- Zernicke, R.F., A.C. Vailas, S.R. Shaw, R.A. Bogey, T.J. Hart, and J.J. Matsuda. Heterogeneous mechanical responses of rat knee menisci to thermomechanical stress. *American Journal of Physiology*, 250:65-70, 1986.
- Vailas, A.C., R.F. Zernicke, J.J. Matsuda, S. Curwin, and J.B. Durivage. Adaptation of rat knee meniscus to prolonged exercise. *Journal of Applied Physiology*, 60:1031-1034, 1986.
- Matsuda, J.J., R.F. Zernicke, A.C. Vailas, V.A. Pedrini, A. Pedrini-Mille, and J.A. Maynard. Structural and mechanical adaptation of immature bone to strenuous exercise. *Journal of Applied Physiology*, 60:2028-2034, 1986.
- Vailas, A.C., R.F. Zernicke, J.J. Matsuda, and D.M. Peller. Regional biochemical and morphological characteristics of rat knee meniscus. *Comparative Biochemistry and Physiology*, 82B:283-285, 1985.
- Vailas, A.C., V.A. Pedrini, A. Pedrini-Mille, and J.O. Holloszy. Patellar tendon matrix changes associated with aging and exercise. *Journal of Applied Physiology*, 58:1572-1576, 1985.
- Martin, T.P., A.C. Vailas, J.B. Durivage, V.R. Edgerton and K.R. Castleman. Quantitative histochemical determination of muscle enzymes: biochemical verification. *Journal of Histochemistry and Cytochemistry*, 33:1053-1059, 1985.
- Vailas, A.C., C.M. Tipton, R.D. Matthes, and M. Gart. Physical activity and its influence on the repair process of medial collateral ligaments. *Connective Tissues Research*, 9:25-30, 1981.

Murphy, R.D., A.C. Vailas, C.M. Tipton, R.D. Matthes, and J.G. Edwards. The influence of diabetes and insulin replacement on the functional capacity of rats. *Journal of Applied Physiology*, 50:482-486, 1981.

Tipton, C.M., R.D. Matthes, A.C. Vailas, and C.L. Schnoebelen. The response of galago senegalensis to physical training. *Journal of Comparative Biochemistry and Physiology*, 63A:29-36,1979.

Vailas, A.C., C.M. Tipton, H.L. Laughlin, T.K. Tchong, and R.D. Matthes. Effects of physical activity and on the aerobic capacity of ligaments and tendons *Journal Applied Physiology*, 44:542-546, 1978.

Tipton, C.M., R.D. Matthes, T.K. Tchong, R.T. Dowel, and A.C. Vailas. The use of Langendorff preparation to study the bradycardia of training. *Medicine Science, Sports and Exercise*, 9:220-230, 1977.

Zambraski, E.H., C.M. Tipton, T.K. Tchong, H.R. Jordan, A.C. Vailas, and A.K. Callahan. Changes in the urinary profiles of wrestlers prior to and after competition. *Medicine Science and Exercise Sports*. 7:186-190, 1975.

## **B. Invited Chapters**

(Teaching Text) Buckwalter, J.A., J.A. Maynard, and A.C. Vailas. Skeletal fibrous tissues. In: *Scientific Basis of Orthopaedics*, edited by J. Albright and D. Brand, Appleton Century Cross, 1987, pp. 387-406.

(Edited Proceedings) Skinner, J., C.M. Tipton, and A.C. Vailas. Exercise, physical training and the aging process. In: *Advances in Gerontology*, edited by A. Vidiik, Academic Press, 1982, pp. 407-439.

(Edited Proceedings) Tipton, C.M., R.D. Matthes, A.C. Vailas, and J.A. Maynard. Lesions and connective tissue. In: *Nordistk Idrettsmedisinsk Kongress Sacrtykk Fra*. 2:67-80, 1977.

(Edited Proceedings) Tipton, C.M., R.D. Matthes, and A.C. Vailas. Influence de l'exercice sur les structures ligamentaires. In: *Fractures Limitant L'Endurance Humaine*, edited by J.R. Lacour, 1977, pp. 103-114.

## **C. Refereed Chapters**

Vailas, A.C. and J.C. Vailas. Exercise and Connective Tissue Adaptation. In: *Exercise, Physical Fitness and Health*, Edited by Claude Bouchard et al. 2nd Edition, Human Kinetics Publishers, 1994, pp.369-382.

Tipton, C.M. and A.C. Vailas. Bone and connective tissue adaptations to physical activity. In: *Exercise Fitness and Health*, Edited by Claude Bouchard et al. Human Kinetics Publishers, 1990, pp. 345-362.

Zernicke, R.F., A.C. Vailas and G.J. Salem. Biomechanical Response of Bone to Weightlessness. In: *Exercise and Sport Science Reviews*, 18:167-192, 1990.

Vailas, A.C., W.P. Morgan and J.C. Vailas. A Physiological and Cellular Basis of Overtraining. In: *Mechanisms of Soft Tissue Inflammation*, 1990, pp. 677-686.

#### **D. Published Reports**

National Research Council's Report of the Committee on a Commercially Developed Space Facility. National Academy Press, Washington DC, 1989, pp.1-109.