

CURRICULUM VITA

Louis S. Stodieck

Associate Research Professor
Aerospace Engineering Sciences

Director
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PROFESSIONAL EXPERIENCE

7/99-Present. Director. BioServe Space Technologies (<http://www.colorado.edu/engineering/BioServe/>), Aerospace Engineering Sciences, University of Colorado, Boulder.

Direct the activities of BioServe Space Technologies, a NASA-sponsored Research Partnership Center (RPC), whose mission is to form partnerships between academia, industry and government to develop new technologies that benefit NASA and the public. The center mission is achieved through directed, ground- and space-based research and development projects in the life sciences with application to medical, pharmaceutical, biotechnology, agribusiness and related industries. BioServe draws funding and resources from a variety of sources, including industry and NASA, that totals \$1.5-\$3.0 million per year. Approximately 25-30 research faculty, staff and students are employed by BioServe to engage in payload hardware design, mission operations, life sciences research and business development activities. BioServe personnel conduct regular research missions currently on the Space Shuttle and the International Space Station and previously on expendable launch vehicles and the Russian Mir space station. BioServe is a highly successful center based on a variety of metrics such as sustained funding, students graduated and placed in leadership positions, payloads successfully built and flown, research accomplishments resulting in significant publications and new technologies developed.

1/08-present Research Professor. Aerospace Engineering Sciences, University of Colorado-Boulder.

9/95-present. Associate Research Professor. Aerospace Engineering Sciences, University of Colorado.

10/87-8/95. Research Associate. Aerospace Engineering Sciences, University of Colorado.

Direct research being conducted by 3-8 graduate and undergraduate students in such areas as controlled ecological life support systems, physiological effects of microgravity and applications of microgravity in biotechnology. Teach lectures in Aerospace Engineering Sciences courses including the capstone Senior Design Projects, Introduction to Space Life Sciences and other bioengineering courses. Co-teach a course called Physiologically Engineered Control Systems.

10/87-6/99. Associate Director for Technical Affairs. University of Colorado, Boulder.

Assisted in directing BioServe from both strategic and tactical perspectives. Provided technical support and management of a variety of commercial development projects in partnership with industry and other university affiliates. Educated companies on commercial opportunities in space, helped to optimize ground and flight research to best utilize a flight opportunity, consulted on space flight environment and hardware constraints, developed project and business plans and other documents required for the CSC program and developed new technologies required to meet commercial goals.

Directed BioServe's flight program including development and operations of various life sciences payloads flown on KC-135 aircraft, Consort and Joust series sounding rockets and Space Shuttle. Provided management for over 20 payloads successfully flown on 14 Space Shuttle missions. Responsibilities included oversight and support of hardware design, fabrication, software development, testing, preparation of NASA integration and safety documents, preparation of Shuttle crew procedures and operations timelines, training of Shuttle crew and negotiation of NASA launch- and recovery site facilities and support. Also responsible for ground and flight

safety verification, payload preparation and turnover prior to flight, real-time flight operations support and post-mission payload deintegration. Managed activities of over 12 staff members and numerous students in support of these responsibilities.

8/85-10/87. Post-doctoral Fellow. University of British Columbia, Vancouver.

Developed complete hardware and software system for measurement of intracellular free calcium in living cells based on micro-fluorescence of the calcium sensitive dye Fura-2, a novel method at the time. Measurements were applied to cultured hippocampal neurons to determine the role of calcium in delayed neuronal death (apoptosis). Also worked with several graduate students and technicians to support electrophysiological, pharmacological and immunohistochemical projects in the areas of neuronal cell death and hyperexcitability.

EDUCATION

1985	Ph.D.	Aerospace Engineering Sciences	University of Colorado, Boulder
1985	M.S.	Aerospace Engineering Sciences	University of Colorado, Boulder
1979	B.S.	Aerospace Engineering Sciences	University of Colorado, Boulder

SCHOLARSHIPS AND FELLOWSHIPS

National Science Foundation Doctoral Fellowship	9/80-8/83
Dean's Giroux Fund Awards	1/80-5/83
University of Colorado Graduate Fellowship	9/83-5/84
Medical Research Council of Canada Postdoctoral Fellowship	10/85-10/87

SOCIETIES

American Society for Gravitational and Space Biology (ASGSB)
American Institute for Aeronautics and Astronautics (AIAA)
American Association for the Advancement of Science (AAAS)
Sigma Gamma Tau (past)
Society for Neuroscience (past)

RESEARCH FUNDING

Current

10/09-9/12	Co-operative Agreement, NASA Ames Research Center, "A Collaborative Effort for Conduct of a Space Life Science Experiment, Principal Investigator, \$630,895.
6/10-5/11	Co-operative Agreement, NASA Johnson Space Center, "An Advanced Integration and Operations System to Support ISS National Lab R&D in the Area of Biotechnology, Energy and Biofuels", Principal Investigator, \$600,000.
1/10-12/10	Sponsored Research Agreement, SPACEHAB, Inc., Space flight research support under the National Lab Pathfinder program. "Vaccine Development Utilizing the Microgravity Environment to Induce Increased Virulence in Pathogenic Bacteria." Principal Investigator, \$1,172,000.

Completed

10/09-9/10	Co-operative Agreement, NASA-Ames Research Center, A collaborative effort for the conduct of spaceflight research experiments. "Streptococcus pneumoniae Expression of Genes in Space (SPEGIS-2)" Principal Investigator, Funding \$278,000.
7/08-12/09	Sponsored Research Agreement, SPACEHAB, Inc., Space flight research support under the National Lab Pathfinder program. "Vaccine Development Utilizing the Microgravity Environment to Induce Increased Virulence in Pathogenic Bacteria." Principal Investigator, \$945,000.

4/08-3/09 Membership Agreement, SPACEHAB, Inc., "National Lab Pathfinder Research Support", Principal Investigator, \$100,000.

12/08-11/09 Education Grant from the National Biomedical Research Institute (NSBRI) entitled, "Butterflies and Spiders in Space". Principal Investigator, \$200,000.

4/07-3/08 Membership Agreement, SPACEHAB, Inc., Space flight research investigation "Effects of Spaceflight on Cultured Plant Cells", Principal Investigator, \$75,000.

5/07-4/08 Membership Agreement, Astronautic Technology - Malaysia, Space Flight research program support "Support of Life Sciences Research on Soyuz Mission 15S", Principal Investigator, Funding \$200,000.

11/01-10/08 BioServe Space Technologies. Cooperative Agreement NCC8-242. Research Partnership Center (RPC). Director and Principal Investigator. NASA funding. \$1,170,000 for FY08 (11/1/07-10/31/08). Cumulative funding from FY02 through FY08 is \$11,900,000. In-kind funding for center activities from industry and non-NASA government partners is comparable to NASA cash funding.

7/06-12/07 Amgen, Inc. - Industry sponsored project agreement, "Examination of Myostatin Inhibition for Treatment of Spaceflight-Induced Muscle Loss in Mice on Space Shuttle Flight STS-118" Co-investigator, PI: Virginia Ferguson, \$375,000.

1/06-12/07 Co-operative Agreement. NNX07AD46A. Commercial Partnerships for the NASA Human Research Program. Principal Investigator, Co-investigators: David Klaus and Virginia Ferguson. Funding \$400,000.

8/06-8/07 Membership Agreement, Malaysian Academy of Sciences, Space Flight Education research investigation "Multi-generational growth and development of c. elegans on the International Space Station", Principal Investigator, Funding \$100,000.

6/06-5/07 Amgen, Inc. - Industry sponsored clinical trial agreement, "A Randomized, Double-Blind, Placebo Controlled, Ascending Multiple Dose Study to Evaluate the Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of AMG 745 in Healthy Subjects". 6/1/2006-5/31/2007. Co-investigators: Leigh Perreault and Virginia Ferguson, Award#20060101-001. \$827,290.

7/04-6/06 Single Loop Cell Culture (SLCC) Unit. Principal Investigator. Sponsored Project Agreement from Payload Systems, Inc., \$285,000.

12/04-12/05 Amgen, Inc. - Industry sponsored Clinical Trial Agreement, "An Exploratory Study in Healthy Male Volunteers to Evaluate the Effect of Immobilization on Myostatin Expression and Activation of Its Downstream Pathway". Principal Investigator. \$260,000.

11/04-10/05 Membership Agreement. Principal Investigator. Payload Systems, Inc. Principal Investigator. \$100,000.

11/04-10/05 Membership Agreement. Co-investigator. Bionetics Corp. Co-Investigator. \$50,000.

11/04-10/31 Membership Agreement. Co-investigator. National Institute of Standards and Technology (NIST). Principal Investigator. \$24,000.

- 1/05-5/05.** Effectiveness of Myostatin Blockade in Preventing the Atrophy of Skeletal Muscle in Mice Disuse Models: Study III. Co-investigator. Sponsored Project Agreement from unnamed industry partner, \$96,000.
- 10/05-5/06** Effectiveness of Osteopontin to Prevent Bone Loss in Hindlimb Suspended Mice. Co-investigator. Sponsored Project Agreement with Sopherion Therapeutics, Inc. Co-Investigator. \$39,000.
- 4/04-3/05.** Effectiveness of Myostatin Blockade in Preventing the Atrophy of Skeletal Muscle in Mice Disuse Models: Study II. Co-investigator. Sponsored Project Agreement from unnamed industry partner, \$90,104.
- 10/03-7/05.** Mission Management, Development, Integration and Flight of the CCU-Single Loop Cell Culture (SLCC) on the International Space Station. Principal Investigator. Sponsored Project Agreement from Payload Systems Inc., \$280,000.
- 5/03-8/03.** Effectiveness of Myostatin Blockade in Preventing the Atrophy of Skeletal Muscle in Mice Disuse Models. Co-investigator. Sponsored Project Agreement from unnamed industry partner, \$42,153.
- 4/03-3/04.** Mission Management, Development, Integration and Flight of the XLINK Research Investigation in Space. Principal Investigator. Supplement to NASA NCC8-242, \$129,376.
- 4/03-9/03.** Hardware and Software Design Phase to Integrate, Test, and Fly the PTIM Spaceflight Experiment in PGBA. Co-investigator. Sponsored Project Agreement from Bionetics Corporation, \$84,884.
- 11/01-10/04.** Research on the Effects of Gravitational Unloading on Synthesis of Structural Compounds in Loblolly Pine. Co-investigator. Awarded \$10,000 each from UPM-Kymmene and Weyerhaeuser in FY03, \$10,000 from Weyerhaeuser in FY04 as membership fees in a research consortium.
- 9/01-8/02.** Hardware Development, Integration and Operations of Yeast, Salmonella and Renal Cell Culture Experiments on STS-112. Principal Investigator. Awarded \$50,000 from the Louisiana Veterans Research and Education Corp.
- 11/98-10/01.** BioServe Space Technologies. Cooperative Agreement NCC8-131. Director and Principal Investigator. Total NASA funding \$8,108,345 for FY99, FY00 and FY01.
- 8/00-4/01.** Integration and Support of NIH-B1 Drosophila Melanogaster Neural Development Experiment on Shuttle Mission STS-106, Principal Investigator. Awarded Joint Research Initiative (JRI) from NASA Ames Research Center for \$25,000.
- 5/00-4/01.** Hardware Development, Integration and Operations of the Renal Cortical Cell Culture “Neurolab Re-flight” on Shuttle Mission STS-106, Principal Investigator, Awarded contract from Louisiana Veterans Research Corp. for \$172,289.
- 1/00-8/01.** Hardware Development, Integration and Operations of the S*T*A*R*S Payload on Shuttle Mission STS-107, Principal Investigator, Awarded contract from SPACEHAB, Inc. for \$219,964. Awarded supplemental funds in FY01 of \$54,755 and FY02 of \$28,000.
- 10/99-9/01.** Examination of Osteoprotegerin Treatment of Spaceflight Induced Bone Loss in Mice on Space Shuttle Flight STS-108, Co-investigator, Awarded contract from Amgen Corp. for \$150,000
- 5/98-10/99.** Integration of NIH-B1 into the CGBA Payload on Shuttle Mission STS-93. Principal Investigator. Awarded Joint Research Initiative from NASA Ames Research Center for \$57,959.

- 12/97-11/98.** BioSpace Protein Crystallization System Experiment on Shuttle Mission STS-95. Principal Investigator. Awarded contract from BioSpace International Inc. for \$64,594.
- 12/97-10/99.** Eriopsis Connexa Predator Behavior during Space Flight on Shuttle Mission STS-93. Principal Investigator. Pending contract from SPACEHAB Inc for \$75,939.
- 11/96-10/98.** BioServe Space Technologies. Cooperative Agreement NCC8-131. Associate Director for Technical Affairs and Co-Investigator. Total NASA funding \$4,005,000 for FY97 and FY98.
- 11/87-10/96.** BioServe Space Technologies. NASA Grant NAGW 1197. Associate Director for Technical Affairs and Co-Investigator. Total NASA funding \$17,014,000 from FY88 through FY96.
- 1/97-7/97.** Programmable Incubator Module (PIM), Principal investigator. Awarded subcontract from Della Enterprises for \$17,800.
- 1/97-7/97.** Improved Materials for Three Dimensional Optical Memory. Principal Investigator. Awarded subcontract from Biological Components Corporation for \$10,000.
- 1/91-12/95.** The Center for Gravitational Studies in Cellular and Developmental Biology. NASA Specialized Center of Research and Training (NSCORT). Subcontract from Kansas State University. Co-investigator through April, 1994. Principal investigator from April, 1994 to December, 1995. Total funding \$880,000.
- 11/92-4/94.** Commercial Animal Biotechnology Spaceflights. NASA-Ames Research Center grant NCA2-759. Co-investigator. \$25,000.
- 9/94-7/95.** Fresh Specimen Sample Storage of Aquatic Cell/Tissue Cultures and Non-Feeding Aquatic Systems. Martin Marietta Services contract NAS2-13227. Principal investigator. \$125,000 for 11 month study.
- 9/94-7/95.** Fresh Specimen Sample Storage of Plant Cell/Tissue Cultures. Martin Marietta Services contract NAS2-13227. Co-investigator. \$99,600 for 11 month study.

COURSES TAUGHT

Neural Systems and Physiological Control. (ASEN 4519/5519) Helped develop new course (Introduced Spring, 1998) on control systems analysis of biological systems. Continue to co-teach every spring. Topics included underlying biophysical and biochemical mechanisms operating at the cellular level and working through the levels of intact organ and integrated system. Addressed biomedical engineering design of devices and methods used to diagnose, monitor and treat disease and defects.

Aerospace Engineering Sciences Senior Design Laboratory. (ASEN 4018/4028) Teach and advise individual projects under the capstone course for Aerospace Engineering Sciences students, where, in groups of 5-10, students carry out design, build and test projects. The fall semester emphasizes design of project from concept through critical design review. Spring semester emphasizes project fabrication, assembly, testing and reporting.

Introduction to Space Life Sciences. (ASEN 5016) Annually give lectures on effects of weightlessness on the cardiovascular system.

DOCTORAL STUDENT SUMMARY

CURRENT STUDENT THESIS ADVISOR

1. **B. Greybeck**, Aerospace PhD Student
Research Topic: Understanding and preventing disuse muscle atrophy

CURRENT STUDENT COMMITTEE MEMBER

1. **Jennifer Mindock**, Aerospace Engineering Sciences, PhD Student, expected graduation 2011.
Research Topic: Human spacecraft design optimization.

FORMER PHD STUDENTS (ADVISOR OR COMMITTEE MEMBER)

1. **A. Hanson**, PhD, Aerospace Engineering Sciences, 2008 (Thesis Advisor, V. Ferguson)
Dissertation Title: *Functional and Physiological Changes with Disuse Atrophy Following Hindlimb Suspension and Microgravity Exposure*
Employment: Postdoctoral position, University of Washington
2. **S. Chappell**, PhD, Aerospace Engineering Sciences, 2006, (Thesis Advisor, D. Klaus)
Dissertation Title: *Analysis of Planetary Exploration Spacesuit Systems and Evaluation of a Modified Partial Gravity Simulation Technique*
Employment: LASP
3. **V. Aponte**, PhD, Aerospace Engineering Sciences, 2006, (Thesis Advisor, D. Klaus)
Dissertation Title: *Development and Analysis of a Novel Cytokine Biosensor Concept for Astronaut Immune System Monitoring*
Employment: Lockheed Martin
4. **J. Russell**, PhD, Aerospace Engineering Sciences, 2005, (Thesis Advisor, D. Klaus)
Dissertation Title: *Expanded Life-Cycle Analysis to Optimize Spacecraft Life Support System Design*
Employment: Postdoc at Purdue Univ. 2005/06, now Lockheed Martin
5. **M. Benoit**, PhD, Aerospace Engineering Sciences, 2005, (Thesis Advisor, D. Klaus)
Dissertation Title: *Responses, Applications, and Analysis of Microgravity Effects on Bacteria*
Employment: Postdoc at Stanford Univ.
6. **H. Seelig**, PhD, Aerospace Engineering Sciences, 2005, *Committee Member (Thesis Advisor, A. Hoehn)*
Dissertation Title: *The Assessment of Water Deficit Stress in Plants using Optical Measurement Methods*
Employment: Postdoc at National Institute of Standards and Technology
7. **M. Sampson**, PhD, Aerospace Engineering Sciences, 2004, *Ex Officio Committee Member (Thesis Advisor, N. Hinners)*
Dissertation Title: Nonprofit, Payload Process Improvement through Lean Management
Employment: Lockheed-Martin, Littleton
8. **D. Byerly**, PhD, Aerospace Engineering Sciences, 2000, (Thesis Advisor, L. Stodieck)
Dissertation Title: A Statistical Model for Predicting Muscle Performance
Employment: Project Scientist, NASA Johnson Space Center
9. **M. Pecaut**, PhD, Aerospace Engineering Sciences, 1999, *Committee Member (Thesis Advisor, M. Fleshner)*
Dissertation Title: The Efficacy of Ground Based Models for Modeling Spaceflight Effects on Immunity
Employment: Research Scientist, Loma Linda University
10. **R. Ayers**, PhD, Aerospace Engineering Sciences, 1999, *Committee Member (Thesis Advisor, S. Simske)*
Dissertation Title: The Interaction Between Bone and Porous Biomaterials in Rabbit and Human Craniomaxillofacial Bone
Employment: Assistant Professor, Colorado School of Mines
11. **M. Kacena**, PhD, Aerospace Engineering Sciences, 1999, *Committee Member (Thesis Advisor, P. Todd)*
Dissertation Title: Modulation of Osteoblast Attachment and Growth *in vitro* by Inertial Forces
Employment: Assistant Professor, Yale University

12. **T. Yoder**, PhD Aerospace Engineering Sciences, 1999, *Committee Member (Thesis Advisor, P. Todd)*
Dissertation Title: *Characterizing the Physics of Plant Root Gravitropism: A systems Modeling Approach*
Employment: Col., USAF; Head, Department of Astronautics, USAFA, Colorado Springs
13. **R. Brown**, PhD, Aerospace Engineering Sciences, 1999, *Committee Member (Thesis Advisor, P. Todd)*
Dissertation Title: *Effects of Spaceflight, Clinorotation and Centrifugation on the Growth and Metabolism of Escherichia coli*
Employment: Lt. Col, USAF; Assistant Professor, Division Chief, Department of Astronautics, USAFA, Colorado Springs
14. **T. Bateman**, PhD, Aerospace Engineering Sciences, 1998, *Committee Member (Thesis Advisor, S. Simske)*
Dissertation Title: Cytokine Therapies for Short-Term Disuse Osteopenia Models in Murines
Employment: Assistant Professor, Clemson University
15. **M. Fleet**, PhD, Aerospace Engineering Sciences, 1995, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: The Effect of Developmental Stage on the Mouse Response to Induced Osteopenia
16. **D. Klaus**, PhD, Aerospace Engineering Sciences, 1994, *initially Committee Member then Thesis Advisor due to untimely death of advisor*
Dissertation Title: Effects of Space Flight on the Growth and Development of *Escherichia coli*
Employment: Assistant Professor, Univ. of Colorado
17. **K. Pollmann**, PhD, Aerospace Engineering Sciences, 1993, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: Fibrin Assembly in Microgravity Using Generic Spaceflight Hardware
18. **M. Edwards**, PhD, Aerospace Engineering Sciences, 1993, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: Effects of Electrical Stimulation on Vestibular Function in Normal and Reduced Gravity
Employment: Emergency physician, Sante Fe
19. **T. Bergren**, PhD, Aerospace Engineering Sciences, 1993, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: Controlling the Materials Properties of in vitro Collagen through Directed cross-linking of Fibrils
Employment: Faculty, Community College of Aurora
20. **E. Gayles**, PhD, Aerospace Engineering Sciences, 1993, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: Muscle Disuse through Tail-Suspension: etiology and therapeutics
Employment: Medical Physiology, Lieutenant, Navy
21. **A. Hoehn**, PhD, Aerospace Engineering Sciences, 1993, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: Effects of Gravity and Light on Plant Growth and Performance in Normal and Reduced Gravity
Employment: Associate Research Professor, Univ. of Colorado
22. **W. Faller**, PhD, Aerospace Engineering Sciences, 1992, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: Neural Network Experiments: Biological and Artificial
Employment: Private Consultant
23. **S. Johnson**, PhD, Aerospace Engineering Sciences, 1990, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: Ultrasonic Applications for Space Based Life Support Systems
Employment: Research Scientist, NASA Johnson Space Center
24. **S. Simske**, PhD, Electrical and Computer Engineering, 1990, *Committee Member (Thesis Advisor, M. Luttges)*
Dissertation Title: Development of Model Osteoporosis in Mice: Alleviation by Electromagnetics and Alternative Therapeutics
Employment: Hewlett Packard Advanced Technologies, Greely

PUBLICATIONS

Refereed Journal Publications

- “Changes in Gene Expression of HepG2 Cells Exposed to Microgravity”, Khairul-Bariah, AAN, Then, SM, Rageshwary, R, Fazlina, N, Wan-Zurinah, WN Roslan, H, Klaus, DM, Stodieck, LS and Jamal, R, *Grav Space Biology Bull*, 2010, 23(2): 91-92.
- “The effects of space flight and microgravity on the growth and differentiation of PICM-19 pig liver stem cells”, Talbot NC, Caperna TJ, Blomberg L, Graninger PG, Stodieck LS, *In Vitro Cell Dev Biol Anim*. 2010 46(6):502-15.
- “Microarray analysis of spaceflown murine thymus tissue reveals changes in gene expression regulating stress and glucocorticoid receptors”, Lebsack TW, Fa V, Woods CC, Gruener R, Manziello AM, Pecaut MJ, Gridley DS, Stodieck LS, Ferguson VL, Deluca D, *J Cell Biochem*. 2010, 110(2):372-81.
- “Seven days of muscle re-loading and voluntary wheel running following hindlimb suspension in mice restores running performance, muscle morphology and metrics of fatigue but not muscle strength”, Hanson AM, Stodieck LS, Cannon CM, Simske SJ, Ferguson VL, *J Muscle Res Cell Motil*. 2010, 31(2):141-53.
- “Effects of spaceflight on innate immune function and antioxidant gene expression”, Baqai FP, Gridley DS, Slater JM, Luo-Owen X, Stodieck LS, Ferguson V, Chapes SK, Pecaut MJ, *J Appl Physiol*, 2009, 106(6):1935-42.
- “Shifts in Bone Marrow Cell Phenotypes Caused by Space Flight”, Ortega MT, Pecaut MJ, Gridley DS, Stodieck LS, Ferguson VL, Chapes, SK, *J Appl Physiol*, 2009, 106(2):548-55.
- “Effects of Spaceflight on murine skeletal muscle gene expression”, Allen DL, Bandstra ER, Harrison BC, Thorng S, Stodieck LS, Kostenuik PJ, Morony S, Lacey DL, Hammond TG, Leinwand LL, Argraves WS, Bateman TA, Barth JL, 2009, *J Appl Physiol*, 2009 Feb;106(2):582-95
- “Spaceflight effects on T lymphocyte distribution, function and gene expression”, Gridley DS, Slater JM, Luo-Owen X, Rizvi A, Chapes SK, Stodieck LS, Ferguson VL, Pecaut MJ, 2009, *J Appl Physiol*, 2009 Jan;106(1):194-202.
- “Plant water parameters and the remote sensing R_{1300}/R_{1450} leaf water index: controlled condition dynamics during the development of water deficit stress”, Seelig, H-D, Hoehn, A, Stodieck, LS, Klaus, DM, Adams III, WW and Emery, WJ, 2009, *Irrigation Sci*, 27(5):357-365.
- “Novel Sfp1 transcriptional regulation of *Saccharomyces cerevisiae* gene expression changes during spaceflight”, Coleman CB, Allen PL, Rupert M, Goulart C, Hoehn A, Stodieck LS, Hammond TG, 2008, *Astrobiology*. 8(6):1071-8.
- “Extraneous variables and their influence on reflectance-based measurements of leaf water content”, Seelig ,H-D., Adams, W.W., Hoehn, A., Stodieck, L.S., Klaus, D.M. and Emery, W. J. 2008, *Irrigation Science*, 26:407–414 .
- “The assessment of leaf water content using leaf reflectance ratios in the visible, near-, and short-wave infrared”, H-D Seelig, A Hoehn, LS Stodieck, DM Klaus, WW Adams III and WJ Emery, 2008, *Int. J. of Remote Sensing*, 29(13):3701-3713.
- “Relations of remote sensing leaf water indices to leaf water thickness in cowpea, bean, and sugarbeet plants”, H-D Seelig, A Hoehn, LS Stodieck, DM Klaus, WW Admas III and WJ and Emery, 2008, *Remote Sensing of Environment*, 112: 445-455.
- “Space flight alters bacterial gene expression and virulence and reveals a role for global regulator Hfq”, JS Wilson, CM Ott, KH Zu Bentrup, R Ramamurthy, L Quick, S Porwollik, P Cheng , M McClelland, G Tsapralis, T Radabaugh, A Hunt, D Fernandez, E Richter, M Shah, M Kilcoyne, L Joshi, M Nelman-Gonzalez, S Hing, M Parra,

P Dumars, K Norwood, R Bober, J Devich, A Ruggles, C Goulart, M Rupert, L Stodieck, P Stafford, L Catella, MJ Schurr, K Buchanan, L Morici, K McCracken, P Allen, C Baker-Coleman, T Hammond, J Vogel, R Nelson, DL Pierson, HM Stefanyshyn-Piper, CA Nickerson, 2007, *Proc Natl Acad Sci*, 104(41):16299-304.

"Haploid deletion strains of *Saccharomyces cerevisiae* that determine survival during space flight", K. Johanson, P.L. Allen, R.A. Gonzalez-Villalobos, J. Nesbit, C.A. Nickerson, K.H. zu Bentrup, J.W. Wilson, R. Ramamurthy, R. D'Elia, K.E. Muse, J. Hammond, J. Freeman, L.S. Stodieck and T.G. Hammond, 2007, *Acta Astronautica*, 60:460-471.

"Single Loop for Cell Culture (SLCC): Development and spaceflight qualification of a perfusion cell culture system.", A Hoehn, JB Freeman, P Koenig, LS Stodieck, M Vellone, S Williams, J deLuis, W Feenstra, JC Parrish, S Pretorius, L Sun, S Dyble, N Searby, D Vandendriesche, 2006, *Journal of Aerospace*, 115(1):481-491.

"Microbial antibiotic production aboard the International Space Station", MR Benoit, W Li, LS Stodieck, KS Lam, CL Winther, TM Roane, DM Klaus, 2006, *Applied Microbiology and Biotechnology*, 70(4): 403-411, Epub Aug. 10, 2005.

"A Modular Suite of Hardware Enabling Spaceflight Cell Culture Research", A. Hoehn, D.M. Klaus and L.S. Stodieck, 2004, *J. of Grav Physiol.*, 11(1):39-50.

"Skeletal Muscle Adaptations to Microgravity Exposure in the Mouse", B.C. Harrison, D.L. Allen, B. Girten, L.S. Stodieck, P.J. Kostenuik, S. Morony, D. Lacey and L.A. Leinwand, 2003, *J Appl Physiol.*, 95(6):2462-70.

"Preventing Annoyance from Odors in Spaceflight: a Method for Evaluating the Sensory Impact of Rodent Housing", P. Dalton, M. Gould, B. Girten, L.S. Stodieck and T.A. Bateman, 2003, *J Appl Physiol.*, 95(5):2113-21

"Genetic Models in Applied Physiology: Effects of Spaceflight on Immunity in the C57BL/6 Mouse, Part I: Activation, Cytokines, Erythrocytes and Platelets", D.S. Gridley, G.A. Nelson, L.L Peters, P.J. Kostenuik, T.A. Bateman, S. Morony, L.S. Stodieck, D.L.Lacey, S.J. Simske and M.J. Pecaut, 2003, *J Appl Physiol*, 94(5):2095-103.

"Genetic Models in Applied Physiology: Effects of Spaceflight on Immunity in the C57BL/6 Mouse, Part I: Immune Population Distributions", M.J. Pecaut, G.A. Nelson, L.L Peters, P.J. Kostenuik, T.A. Bateman, S. Morony, L.S. Stodieck, D.L.Lacey, S.J. Simske and D.S. Gridley, 2003, *J Appl Physiol*, 94(5):2085-94.

"The Effect of Space Flight on the Production of Actinomycin D by *Streptomyces plicatus*", K.S. Lam, D.R. Gustavson, D.L. Pirnik, E. Pack, C. Bulanahgui, S.W. Mamber, S. Forenza, L.S. Stodieck and D.M. Klaus, 2002, *J. Industrial Microbiology and Biotechnology*, 29(6):299-302.

"Approaches in the Determination of Plant Nutrient Uptake and Distribution in Space Flight Conditions", A.G. Heyenga, A. Forsman, L.S. Stodieck, A. Hoehn and M. Kliss, 2000, *Adv in Space Research*, 26(2):299-302.

"Recent Advances in Technologies Required for a "Salad Machine"", M. Kliss, A.G. Heyenga, A. Hoehn and L.S. Stodieck, 2000, *Adv in Space Research*, 26(2):263-269.

"Cellular Responses to Gravity: Extracellular, Intracellular and in-between", P. Todd, DM Klaus, LS Stodieck, JD Smith, L.A. Staehelin, M. Kacena, B. Manfredi and A. Bukari, 1998, *Adv Space Res*, 21(8-9):1263-1268

"Autonomous Biological System (ABS) Experiments", T.K. MacCallum, G.A. Anderson, J.E. Poynter, L.S. Stodieck and D.M. Klaus, 1998, *Biological Sciences in Space*, 12(4):363-365.

"Toxicological Compatibility of Space Flight Containment Hardware with Life Sciences Samples", L.S. Stodieck, P. Todd and M.W. Luttges, 1994, *Acta Astronautica*, 33.

"Investigation of Space Flight Effects on Escherichia coli and a Proposed Model of Underlying Physical Mechanisms", D. Klaus, S. Simske, P. Todd and L. Stodieck, 1997, *Microbiology*, 143:449-455.

"Hydrodynamically Induced Fluid Transfer and Non-convective Double-diffusion in Microgravity Sliding Solvent Diffusion Cells", K.W. Pollmann, L.S. Stodieck and M.W. Luttges, 1994, *Microgravity Sci. and Tech.*, 8(1):50-59.

"Four educational programs in space life sciences", M.W. Luttges, L.S. Stodieck and D.M. Klaus, *Adv in Space Research*, 1994, 14(8):439-446.

"Plant-module for autonomous space support", M.W. Luttges, L.S. Stodieck and A. Hoehn, *Adv in Space Research*, 1994, 14(11):53-60.

"Structural properties of spinal nerve roots: Biomechanics", J.A. Beel, L.S. Stodieck and M.W. Luttges, *Experimental Neurology*, 1986, 91:30-40.

"Structural properties of spinal nerve roots: Protein composition", L.S. Stodieck, J.A. Beel and M.W. Luttges, *Experimental Neurology*, 1986, 91:41-51.

"Post injury changes in the biomechanics of nerves and roots", M.W. Luttges, L.S. Stodieck and J.A. Beel, *J. of Manipulative Physiological Therapeutics*, 1986, 9(2):89-98.

"Relationships between the electrocardiogram and phonocardiogram: Potential for improved heart monitoring", L.S. Stodieck and M.W. Luttges, *ISA Transactions*, 1984, 23(4):59-64.

"Protein composition and synthesis in the adult mouse spinal cord", L.S. Stodieck and M.W. Luttges, *Neurochemical Research*, 1983, 8:599-619.

"Stimulation induced alterations in spinal cord protein synthesis", L.S. Stodieck and M.W. Luttges, *Biomechanics Conference on the Spine*, 1980, 11:69-82.

Refereed Conference Proceedings

"Science Research and Education Modules for the CGBA Spaceflight Incubator", A Hoehn, L Stodieck, J Freeman, W Kalinowski, CV Goulart, KK Gifford, S Williams, P Koenig, S Countryman, S Kuzminski, 2007, SAE-paper 2007-01-3188.

"Single Loop for Cell Culture (SLCC): Development and Spaceflight Qualification of a Perfusion Cell Culture System.", A Hoehn, JB Freeman, P Koenig, LS Stodieck, M Vellone, S Williams, J deLuis, W Feenstra, JC Parrish, S Pretorius, L Sun, S Dyble, N Searby, D Vandendriesche, 2006, SAE-paper 2006-01-2212.

"Effect of Resting Length and Viscoelasticity on Stiffness and Contractile Force in the Intact Muscle", VL Ferguson and LS Stodieck LS.. Fall 2006 Materials Research Society Fall Meeting: Symposium DD Mechanics of Biological and Bio-Inspired Materials. Boston, MA.

"Exercise Prevention of Unloading-Induced Bone and Muscle Loss in Adult Mice", M Roland, AM Hanson, CM Cannon, LS Stodieck, and VL Ferguson, 2005, *Biomed Sci Instrum*, 41:128-134.

"A Novel Combination of Methods to Assess Sarcopenia in Mice", CM Cannon, H Dieter-Seelig, LS Stodieck, AM Hanson, SJ Simsek, and VL Ferguson, 2005, *Biomed Sci Instrum*, 41:116-121.

"Carbon Dioxide Scrubbers for Controlling the Gaseous Composition of Spaceflight Plant Growth Chambers - Design Trades and Test Results", A Hoehn, J Clawson, C Higgins, J Jairala, P Journey-Kahler, J Lee and LS Stodieck, 2005, SAE Paper 2005-01-2954.

"Temperature and Humidity Control Capabilities and Limitations of a Spaceflight Plant Growth Chamber", A Hoehn, J Clawson, J Freeman, C Higgins, C Madsen, LS Stodieck, 2005, SAE Paper 2005-01-2845.

"Non-contact Measurement Methods of Detecting Plant Water Stress for Space Flight Growth Chamber Applications", H.D. Seelig, D. Klaus, L.S. Stodieck, A. Hoehn, 2004, SAE paper 2004-01-2455.

"Approaches in the Design of a Space Plant Cultivation Facility for Arabidopsis Thaliana", A.G. Heyenga, L.S. Stodieck, A. Hoehn, M. Kliss, C. Blackford, 2004, SAE-paper 2004-01-2459.

"Performance of the STARS Life Sciences Habitats in Spaceflight and Ground Controls ", C.V. Goulart, L.S. Stodieck, S.L Woodard and M. Rupert, 2004, SAE-paper 2004-01-2394.

"Spaceflight Plant Science Integration, Testing and Functional / Compatibility Verification", A. Hoehn, M. Sampson, H. Seelig, L. Stodieck, A.G. Heyenga, 2003, SAE Paper 2003-01-2480.

"Thermal Design of a Spaceflight Plant Chamber Payload", A. Hoehn, J. Clawson, J. Freeman, J. Genova, K. Gifford, L. Stodieck, 2003, SAE Paper 2003-01-2583.

"Atmosphere Composition Control of Spaceflight Plant Growth Chambers", A. Hoehn, L.S. Stodieck, J. Clawson, E. Robinson, H. Seelig, M. Kliss and G. Heyenga, 2000, SAE Paper 2000-01-2232

"Low Temperature, Low Energy Carrier (LoTEC) and Phase Change Materials for Biological Samples", F.C. Wessling, L.S. Stodieck, A. Hoehn, S. Woodard, S. O'Brien, and S. Thomas, 2000, SAE Paper 2000-01-2280.

"Optimizing the Structural Subsystem of the AG-Pod Crop Production Unit", J. Clawson, A. Hoehn, L.S. Stodieck, P. Todd and D. Cadogan, 2000, SAE Paper 2000-01-2477.

"Toward the Development of a Salad Machine", M. Kliss, G. Heyenga, A. Hoehn, and L.S. Stodieck, 2000, SAE 2000-01-2476.

"The Design of a Mechanized Seed Sowing System for Space Flight Application", G. Heyenga, M. Kliss, A. Hoehn, L.S. Stodieck, 2000, SAE Paper 2000-01-2506.

"Microgravity Root Zone Hydration Systems", A. Hoehn, B. Kalinowski, A. Rakow, D. Simmons, J. Clawson, P. Scovazzo, L.S. Stodieck, M. Kliss and G. Heyenga, 2000, SAE Paper 2000-01-2510.

"Re-examining Aeroponics for Spaceflight Plant Growth", J.M. Clawson, A. Hoehn, L.S. Stodieck, P. Todd and R.J. Stoner, 2000, SAE Paper 2000-01-2507.

"AG-Pod – The Integration of Existing Technologies for Efficient, Affordable Space Flight Agriculture", J.M. Clawson, A. Hoehn, L.S. Stodieck and P. Todd, 1999, SAE Paper 1999-1-2176.

"Incubator Designs for Space Flight Application Optimization and Automation", A. Hoehn, J.B. Freeman, M. Jacobson and L.S. Stodieck, 1999, SAE Paper 1999-1-2177.

"Mass Transport in a Spaceflight Plant Growth Chamber", A. Hoehn, J. Clawson, A.G. Heyenga, P. Scovazzo, K.S. Sterrett, L.S. Stodieck and P.W. Todd and M.H. Kliss, 1998, SAE Paper 981553.

"On-orbit and Ground Performance of the PGBA Plant Growth Facility", A. Hoehn, D.J. Chamberlain, S.W. Forsyth, D.S. Hanna, A.G. Heyenga, M.B. Horner, M.H. Kliss, P. Scovazzo, L.S. Stodieck and P.W. Todd, 1997, SAE paper 97-2366.

"Seed Germination and Early Plant Morphology - Results from Three Microgravity Missions", A. Hoehn, M.W. Luttgies and L.S. Stodieck, 1994, SAE Paper 941546.

“P-MASS and P-GBA: Two New Hardware Developments for Growing Plants in Space”, A. Hoehn, M.H. Kliss, M.W. Luttges, M.C. Robinson and L.S. Stodieck, 1994, SAE Technical Paper 941545.

“Investigation of Space Flight Effects on Escherichia coli Growth”, D.M. Klaus, M.W. Luttges and L.S. Stodieck, 1994, SAE Paper 941260.

“Design and Evaluation of a Payload to Support Plant Growth onboard COMET I”, A. Hoehn, M.H. Kliss, L.S. Stodieck, M.W. Luttges and M.C. Robinson, 1992, SAE Paper 921389.

“Mouse tail-suspension as a model of microgravity: Effects on skeletal, neural and muscular systems”, S. Simske, C. Somps, E. Gayles, L.S. Stodieck, H. Wachtel and M.W. Luttges, 1989, SAE Paper 891489.

Non-Refereed Conference Papers

Hanson AM, Simske SJ, Stodieck LS, Cannon CMA, Ferguson VL. "Musculoskeletal adaptation to hindlimb suspension and voluntary cage wheel exercise." 5th World Congress of Biomechanics, Munich Germany, August 4, 2006.

Ferguson VL, Cannon CMA, Campbell SE, Hanson AM, Bateman TA, Stodieck LS. "Tissue level bone material property changes with sciatic nerve injury and bisphosphonate therapy." 5th World Congress of Biomechanics, Munich Germany, August 4, 2006.

“Commercial Space Life Sciences Research: Opportunities and Challenges on the International Space Station”, L.S. Stodieck, D. Klaus and A. Hoehn, Conference on International Space Station Utilization, October 2001, Cape Canaveral, FL, AIAA 2001-4911.

“Antibiotic Production in Space Using an Automated Fed-Bioreactor System”, D. Klaus, M. Benoit, J. Bollich, J. Freeman, L. Stodieck, G McClure and K.S. Lam, Conference on International Space Station Utilization, October 2001, Cape Canaveral, FL, AIAA 2001-4921.

"Use of Spaceflight and Spaceflight Simulation to Evaluate Osteoprotegerin for the Treatment of Disuse Osteoporosis", T.A. Bateman, L.S. Stodieck, P.J. Kostenuik, V.L Ferguson and S.J. Simske, 2000, Space Technology and Applications International Forum, American Institute of Physics Proceedings, 504:580-581.

"Potential Use of the International Space Station by the Biotechnology/ Pharmaceutical/ Biomedical Sector", G.W. Morgenthaler and L.S. Stodieck, 1999, Space Technology and Applications International Forum, American Institute of Physics Proceedings, 458:239-244.

“Benefits Attained from Space Flight in Pre-Clinical Evaluation of Candidate Drugs”, L.S. Stodieck, T. Bateman, R. Ayers, V. Ferguson and S. Simske, 1998, Space Technology and Applications International Forum, American Institute of Physics Proceedings, 420(2):627-632.

“Space Flight Research Leading to the Development of Enhanced Plant Products: Results from STS-94”, L.S. Stodieck, A. Hoehn and A.G. Heyenga, 1998, Space Technology and Applications International Forum, American Institute of Physics Proceedings, 420(2):593-602.

“One-Year Post-Flight Summary of the Commercial Generic Bioprocessing Apparatus (CGBA) Payload”, D. Klaus and L.S. Stodieck, United States Microgravity Laboratory-2 (USML-2) One Year Report, NASA/TM-1998-208697, 1:231-259, 1998.

“A Review of Plant Experiments Supported by the Astro/Plant Generic Bioprocessing Apparatus on MSL-1”, A.G. Heyenga, A. Hoehn and L.S. Stodieck, Microgravity Sciences Laboratory-1 One Year Report, Huntsville, Alabama, August 25-26, 1998.

“10 Day Flight Performance of the Plant Generic Bioprocessing Apparatus (PGBA) Plant Growth Facility Aboard STS-77”, A. Hoehn, D.J. Chamberlain, S.W. Forsyth, D.S. Hanna, P. Scovazzo, M.B. Horner, L.S. Stodieck, P. Todd, A.G. Heyenga, M.H. Kliss, R. Bula and R. Yetka, 1997, *Space Technology and Applications International Forum*, American Institute of Physics Proceedings, 387(2):1005-1017.

“Plant Generic Bioprocessing Apparatus: A Plant Growth Facility for Space Flight Biotechnology Research”, A. Hoehn, D.J. Chamberlain, S.W. Forsyth, K. Gifford, D.S. Hanna, M.B. Horner, P. Scovazzo, J. Smith, L.S. Stodieck and P.W. Todd, 1996, *Proceedings from Sixth European Symposium on Life Sciences Research in Space*.

“Automation for Improved Physiological Research in Microgravity Using Laboratory Animals”, D. Conrad, J. Emond, L. Stodieck, 1996, AIAA-96-4326.

“Development of a Carbonated Beverage System for use in Space: Results of Ground-based and KC-135 Reduced Gravity Testing”, M.B. Horner, A. Hoehn, M. Edwards, K.K. Gifford, M.A. Rupert, J.A. Knudsen, T.R. Asnicar and L.S. Stodieck, 1996, *Proceedings from Sixth European Symposium on Life Sciences Research in Space*.

“Commercial Generic Bioprocessing Apparatus”, M.C. Robinson, L.S. Stodieck and M.W. Luttges, 1993, AIAA Paper 93-4314.

“Commercial Investigation Results for the Generic Bioprocessing Apparatus Flown on United States Microgravity Laboratory-1”, L.S. Stodieck, M.C. Robinson and M.W. Luttges, 1993, *NASA Conference Publication 3272*. pp. 473-507.

“Commercial Generic Bioprocessing Apparatus (CGBA) and BioServe Pilot Lab (BPL)”, M.W. Luttges, L.S. Stodieck and M.C. Robinson, 1993, *SPACEHAB Mission 1 (STS-57) Experiment Symposium Proceedings*, Washington, D.C.

PATENTS

United States Patent, 5,947,334 (Rudick, et al.), Sept. 7, 1999. “**Post-mix beverage system for use in extra-terrestrial space**”. Rudick; Arthur G. (Atlanta, GA); Gupta; Ashis (Marietta, GA); Myers; Michael J. (Lawrenceville, GA); Kjolraug; Christopher C. (Alpharetta, GA); Hoehn; Alexander (Boulder, CO); Stodieck; Louis S. (Boulder, CO); Horner; Michael B. (Boulder, CO); Edwards; Mark T. (Boulder, CO); Sterrett; Kirsten S. (Westminster, CO); Genova; Jon A. (Boulder, CO); Rupert; Mark A. (Boulder, CO). The Coca-Cola Company (Atlanta, GA). Filed: May 17, 1997.