

Cell Biology and Biotechnology in Space

**Neal R. Pellis, Ph.D.
Biological Systems Office
NASA Johnson Space Center
Houston, TX 77058
281-483-2357
Npellis@ems.jsc.nasa.gov**

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Wolfgang Guggemos



Cell Biology And Biotechnology In Space:

Cell Biology and Biotechnology in Space Augusto Cogoli, 2002-11-04 The advent of the International Space Station ISS and the exploration by humans of planets of the Solar system like the Moon and Mars is triggering worldwide interest Space biology a discipline familiar so far only to a restricted community is gaining momentum Space biologists are dealing with the behavior of terrestrial life in the extraterrestrial environment in particular in 0 g Several surprising and interesting phenomena have been discovered in 20 years of investigations in space laboratories This began with so called fishing experiments i e investigations trying to find out without solid hypotheses whether a biological system is altering its behavior when exposed to zero gravity Today s space biology is a scientific discipline based on systematic studies carried out by renowned scientists Some of the leaders in the field describe their work ideas and findings This book will introduce the reader to this still young field of research which will certainly provide unexpected and significant surprises in the future

Cell Biology and Biotechnology in Space Advances in Space Biology and Medicine Vol-8 Cogoli Augusto, 2002

Fundamentals of Space Biology Gilles Clément, K. Slenzka, 2006-10-28 *Fundamentals of Space Biology* is the third textbook addressing Space Life Sciences in this Space Technology Library series The first of these books focused on the psychological and psychiatric issues that affect people who live and work in space Volume 16 Space Psychology and Psychiatry The second book described the physiological and medical issues of living in a space environment Volume 17 *Fundamentals of Space Medicine* The objective of this third book was to review the effects of spaceflight on less complex biological systems from single cells to animals and plants Indeed to better understand the changes at the function level it is necessary to comprehend the changes at cellular and tissue levels Studies of cell cultures for example allow the investigation of the indirect effects of gravity i e those which occur not because of changes in the stimulation of dedicated gravity sensing organs but because of the new physical properties resulting from the reduction in gravitational force within the cell

Biotechnology in Space Günter Ruyters, Christian Betzel, Daniela Grimm, 2017-12-21 This book summarizes the early successes drawbacks and accomplishments in cell biology and cell biotechnology achieved by the latest projects performed on the International Space Station ISS It also depicts outcomes of experiments in tissue engineering cancer research and drug design and reveals the chances that research in Space offers for medical application on Earth This SpringerBriefs volume provides an overview on the latest international activities in Space and gives an outlook on the potential of biotechnological research in Space in future This volume is written for students and researchers in Biomedicine Biotechnology and Pharmacology and may specifically be of interest to scientists with focus on protein sciences crystallization tissue engineering drug design and cancer research [Future Biotechnology Research on the International Space Station](#) National Research Council, Commission on Physical Sciences, Mathematics, and Applications, Space Studies Board, Task Group for the Evaluation of NASA's Biotechnology Facility for the International Space Station, 2000-04-14 Under

current NASA plans investigations in the area of biotechnology will be a significant component of the life sciences research to be conducted on the International Space Station ISS They encompass work on cell science and studies of the use of microgravity to grow high quality protein crystals Both these subdisciplines are advancing rapidly in terrestrial laboratories fueled by federal and industrial research budgets that dwarf those of NASA s life science program Forging strong and fruitful connections between the space investigations and laboratory bench biologists a continual challenge for NASA s life sciences program is thus of great importance to ensuring the excellence of ISS research This report evaluates the plan for NASA s biotechnology facility on the ISS and the scientific context that surrounds it and makes recommendations on how the facility can be made more effective In addition to questions about optimizing the instrumentation the report addresses strategies for enhancing the scientific impact and improving the outreach to mainstream terrestrial biology No major redirection of effort is called for but collectively the specific targeted changes recommended by the task group would have a major effect on the conduct of biotechnology research in space

Space Biology and Space Biotechnology Ai-Rong Qian,Xiao Lin,Suryaji Chandrarao Patil,Hafiz Muhammad Umer Farooq,2025-06-17 Space Biology and Space Biotechnology provides the reader with a wide ranging review of space biology and related fields Topics covered include the space environment space microbiology space botany space hydrobiology space physiology space development space ecology animal and tissue engineering space simulation technology and space pharmaceuticals Written for professionals in biology and biotechnology graduate students and post docs as well as spaceflight professionals in industry academia and government this book covers all the right bases in space biology and biotechnology Presents cutting edge developments and applications of space biology and space biotechnology Includes coverage of the applications of artificial intelligence and bioinformatics in space biology Fills a gap in the current literature about space biology and space biotechnology

Cells in Space Jean D. Sibonga,1989 Discussions and presentations addressed three aspects of cell research in space the suitability of the cell as a subject in microgravity experiments the requirements for generic flight hardware to support cell research and the potential for collaboration between academia industry and government to develop these studies in space Synopses are given for the presentations and follow on discussions at the conference and papers are presented from which the presentations were based An Executive Summary outlines the recommendations and conclusions generated at the conference

Advances in Space Biology and Medicine Sjoerd L. Bonting,1995-03-01 This fourth volume in the series dedicated entirely to the results of the first European study of the effects of long term confinement and isolation The volume continues to attempt to fulfill the aim of this series to bring the findings and accomplishments in the field of space biology and medicine to a wider group of scientists than merely the relatively small group of biologists and physiologists currently involved in space experimentation The contributions are not only nicely spread geographically with three chapters from the United States two each from Russia Europe and Japan they also offer a wide range of topics in the field covering humans animals plants cells and even potential

extraterrestrial beings As before not only problems investigated and results obtained are reviewed but also some of the technical aspects peculiar to this field are treated An example in this volume is the chapter on virtual environments by Ellis which is meant to help investigators understand the opportunities that these techniques might offer for future investigations In view of the limitations on flight opportunities and the constraints still inherent in orbital experimentation it is also important to consider the information that can be obtained from studies on the ground In addition to simulation studies like bed rest for human subjects see the chapter by Edgerton et al on neuromuscular adaptation tail suspension of rats and plants on a clinostat see the chapter by Masuda et al there is the interesting possibility of using gravitropic mutants for studying the effects of weightlessness on plant growth as described by Takahashi and Suge Two chapters are devoted to a review of the results on rats flown on nine Cosmos biosatellite flights between 1973 and 1989 the chapter by Krasnow deals with the neuromorphological effects of micro and hypergravity that by Popova and Grigoriev with the metabolic effects of spaceflight The effects of weightlessness on heart and lung function in humans are reviewed in detail by Bonde Petersen and Linnarson While the study of humans animals and plants in spaceflight have taught us much about the effects of the space environment on living organisms we still have a very limited understanding of the mechanisms operating in these effects The chapter by Rijken et al on the effects of gravity on the cellular response to epidermal growth factor demonstrates how by a judicious use of experiments on the ground and in sounding rockets the mechanism of a microgravity effect on cell growth could be unravelled The question whether there is intelligent life elsewhere in the universe has intrigued mankind for a long time In the chapter by Coulter et al on NASA s High Resolution Microwave Survey the project to search for the existence of such life is described The postscript to this chapter tells how through an unfortunate decision of the U S Congress this project after a successful start is threatened with an untimely ending

Proceedings of the ... European Symposium on Life Sciences Research in Space, 1990 **Bioprocessing in space**, 1976 **A Strategy for Research in Space Biology and Medicine in the New Century** National Research Council, Division on Engineering and Physical Sciences, Space Studies Board, Committee on Space Biology and Medicine, 1998-10-16 Construction of the international space station scheduled to start in late 1998 ushers in a new era for laboratory sciences in space This is especially true for space life sciences which include not only the use of low gravity as an experimental parameter to study fundamental biological processes but also the study of the serious physiological changes that occur in astronauts as they remain in space for increasingly longer missions This book addresses both of these aspects and provides a comprehensive review of ground based and space research in eleven disciplines ranging from bone physiology to plant biology It also offers detailed prioritized recommendations for research during the next decade which are expected to have a considerable impact on the direction of NASA s research program The volume is also a valuable reference tool for space and life scientists

Space Station Freedom Utilization Conference, 1992 **On the Convergence of Bio-, Information-, Environmental-, Energy-, Space- and**

Nano-Technolgies Kwang Hwa Chung, Yong Hyeon Shin, Sue Nie Park, Hyun Sook Cho, Soon Ae Yoo, Byung Joo Min, Hyo Suk Li, Kyung Hwa Yoo, 2005-01-15 Proceedings of the 1st International Women s Conference on Bien Technology Daejeon Kore 13 16 November 2003 **Aerospace Medicine and Biology** ,1993 A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in Scientific and technical aerospace reports STAR and International aerospace abstracts IAA **Scientific and Technical Aerospace Reports** ,1993 *Life and environment* ,2002 **Congressional Record** United States. Congress,1992 The Congressional Record is the official record of the proceedings and debates of the United States Congress It is published daily when Congress is in session The Congressional Record began publication in 1873 Debates for sessions prior to 1873 are recorded in The Debates and Proceedings in the Congress of the United States 1789 1824 the Register of Debates in Congress 1824 1837 and the Congressional Globe 1833 1873 **Biotechnology System Facility: Risk Mitigation on Mir** ,2003 Space Biology and Medicine: Humans in spaceflight (bks. 1 & 2) Arnauld E. Nicogossian,1996 Nicogossian Arnauld E Investigator NASA Center HQS *Space Commerce* ,1988

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