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Welcome to Lake Buena Vista, FL., USA

On behalf of the local organizing committee, I would like to welcome you to Lake Buena Vista, Florida, which is just outside Orlando, Florida. This year we have modified the organizational structure, combining efforts from Florida, California and Copenhagen. Hopefully these efforts have been successful. We have included all information pertaining to the conference in this program booklet. We also have provided a folder for your convenience. The meeting room will be arranged in a classroom style to facilitate taking notes. Coffee and tea will be arranged at the breaks. The secretariat outside the conference room will be available to assist you. Posters will be manned in the rear area adjacent to the auditorium.

The organizing committee has arranged an exciting program, which has been augmented by a large number of free talks and posters. A reception is arranged on Sunday evening at 7 PM at the Grosvenor Resort. I encourage you to participate in this reception so we can meet informally prior to the scientific program. Please wear your nametag to the reception, as well as the meetings to facilitate interactions. We have not set up meetings with dignitaries since we are in the premiere vacation resort in the U.S. and would like to allow you to partake in as many activities as possible. Please check with the hotel staff regarding transportation to major attractions. For those interested in nightlife activities, dining, movies, and shopping you need only to walk across the street to Downtown Disney and Pleasure Island. You never know whom you will run into! On Wednesday evening we will have our annual dinner at the Grosvenor. If you have any dietary restrictions please let me know as soon as possible in order to accommodate your needs. On Friday we will have a bus tour of Kennedy Space Center and spend a couple of hours visiting the visitors center at the Cape. Lunch will be at your own expense at the Visitors Center.

I hope you enjoy the meeting and as well as your visit to the Orlando area.

Michael J. Katovich

ORGANIZATION

Organized and Co-sponsored by:



International Society for Gravitational Physiology (ISGP)

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Supported by:

- Department of Pharmacodynamics, College of Pharmacy, University of Florida.
- NASA
- ESA
- Galileo Foundation
- Danish Aerospace Medical Centre of Research (DAMEC Research A/S, National University Hospital)

LIST OF CONTENTS

GENERAL INFORMATION.....	4
SCIENTIFIC INFORMATION.....	5
SOCIAL EVENTS	6
PROGRAM.....	7
POSTER SESSIONS	21

GENERAL INFORMATION

Organizers

The 20th Annual International Gravitational Physiology Meeting is organized by the International Society for Gravitational Physiology (ISGP) and is cosponsored by ISGP and the IUPS Commission on Gravitational Physiology.

Additional financial support is provided by the Department of Pharmacodynamics, College of Pharmacy, the University of Florida, and NASA.

Professors Michael J. Katovich, President of ISGP, Harvey Lillywhite and Tom Wronski from the University of Florida are pleased to be the local hosts for the meeting.

Hotel and Place of Meeting

Grosvenor Resort Hotel
Walt Disney World Village
P.O. Box 22202
1850 Hotel Plaza Boulevard
Lake Buena Vista
Orlando, Florida 32830-2202
USA

Telephone: +1 407 828 4444 or 1 800 624 4109 (USA only)
Telefax: +1 407 828 8192

There is a web site for the hotel, which describes the guest rooms, facilities, meeting rooms, transportation, etc. Please log on before you leave to see what you can expect. <http://www.grosvenorresort.com/>

Secretariat

Carol Katovich
Bobbi Jo Thompson
Lotte Rosenkrands

Registration

The registration desk outside the meeting room will be open on Sunday, June 6 from 13:00 to 18:00 and from Monday, June 7 to Thursday, June 10 from 8:00 to 18:00.

Registration fees

Registrant \$ 250

Student	\$ 75
Guest	\$ 125

The registration fee includes participation in:

- Scientific sessions
- Satellite Symposium
- Welcome reception
- Gala Dinner
- Bus tour
- Coffee breaks

Lunch

On own expense at the hotel or nearby.

Transportation

There is a shuttle service available from Orlando International Airport through Mears Transportation. If you desire further information, Mears can be contacted at +1 407 423 5566. The round trip fare is \$ 25. If driving from Orlando International Airport: Take 528 (Beeline) West to I-4. Take I-4 West to exit 27 (Lake Buena Vista). Make a right on to 535. Take 535 to the 1st traffic light, which will be Hotel Plaza Blvd. and make a left. Continue down Hotel Plaza Blvd. and the Grosvenor is the last resort on the right. An approximately 30 minute drive.

SCIENTIFIC INFORMATION

Information to Chairpersons

The chairperson must confirm the presence of all speakers before each session, make sure that the session starts exactly at the time indicated in the program and that the session stays within the time limits.

Oral Presentations

Invited papers:	20 min for presentation and 5 min for discussion.
Free papers:	10 min for presentation and 5 min for discussion.

The speaker is responsible for preparing slides and handing them in to the slide projectionist. Slide carousels will be available for each speaker. Speakers should load their own slides prior to the session and label the carousel. A viewing area will be made available to screen slides.

Poster Presentations

Since there will be a different set of posters each day, the presenter is requested to prepare the poster in the morning and take it down in the evening. The presenter is kindly required to be present at the poster as indicated in the program. The numbers on the poster boards correspond to the numbers indicated in this program. The poster size is 4 ft (120 cm) high and 4 ft (120 cm) wide. Posters are free standing and 4ft x 8 ft, thus there will be two presentations on each side of the board.

Proceedings

Instructions for the preparation of manuscripts has been mailed to all participants who have submitted abstracts. Please contact Dr. Fuller for further information. Only papers and posters presented at the meeting will be accepted for publication.

Satellite Symposium

The Department of Pharmacodynamics, College of Pharmacy, University of Florida, and NASA have organized a half-day symposium on The Effects of Gravity on Pharmacokinetics. The meeting will be held on Sunday afternoon, June 6, 1999, from 14:00-18:00 at the Grosvenor Resort.

SOCIAL EVENTS

Welcome Reception

A Welcome Reception will be held on Sunday, June 6, 1999, at 19:00 at the Grosvenor Resort.

Gala Dinner

A Gala Dinner for all registered participants will be held on Wednesday, June 9, 1999, at 19:30.

Regional Tour to Kennedy Space Center

A private bus tour of Kennedy Space Center is arranged for Friday, June 11. Air conditioned buses will transport participants to the Space Center and back to the Grosvenor Resort. After the two-hour tour the buses will return to the information center and two hour of free time will be available for visiting the area. A cafeteria is available for those wishing to have lunch before the bus ride back to the hotel. The transit time is about 1 hour. Tentatively we plan to leave the hotel at 9:00 and return by 15:30.

PROGRAM

Sunday, June 6, 1999

13:00 – 18:00 Registration

Registration desk, Grosvenor Resort Hotel

14:00 – 18:00 Satellite Symposium: The Effect of Gravity on Pharmacodynamics

Chairmen: M. J. Katovich, J. Vernikos

14:00 Opening Remarks and Welcome

M. Katovich

14:05 Physiological Changes In Spaceflight That May Affect Drug Action

J. Vernikos, T. Czarnik

14:30 Critical Pharmacokinetic Parameters In Evaluating The Effects Of Gravity And Its Use In Special Circumstances

L. Benet

15:10 Therapeutic Implications of Pharmacokinetic Changes During Spaceflight

L. Putcha

15:40 – 16:10 Coffee break

16:10 The Impact of Spaceflight on Dosage Form Design

J. Hughes

16:40 Age-related Changes in Pharmacokinetics: Potential Impact in Space

J. Schwartz

17:10 Noninvasive, In-Situ Measurement Of Drug Concentrations In Tissue Using Optical Spectroscopy

I. Bigio

19:00 Welcome Reception

Grosvenor Resort Hotel

Monday, June 7, 1999

08:00 – 08:15 Opening session & Welcome

P. Norsk, Chairman of the Council of Trustees, ISGP

M. J. Katovich, President, ISGP

M. G. Velarde, President, ELGRA

08:15 – 11:15 Symposium I: Current Concepts in Gravitational Physiology

Chairmen: C. A. Fuller, P. Norsk

08:15 Does Head-Down Bed Rest Simulate the Effects of Micro-G?

Pro: V. A. Convertino

08:25 Does Head-Down Bed Rest Simulate the Effects of Micro-G?

Con: P. Norsk

08:35 Does Head-Down Bed Rest Simulate the Effects of Micro-G?

Discussion

08:45 Physiological Control of the Skeletal Muscle Structure and Function under Actual and Simulated Microgravity

B. S. Shankman

09:10 Can Centrifugation at Increased Gs be used to Predict Results of 0 G?

R. R. Burton

09:35 Effects of Hyper-G on Energy Balance in Young and Old Rats

C. Wade

10:00 – 10:25 Coffee break

10:25 Effects of Gravity on Development

J. Alberts

10:50 Circumnutations without Gravity: A Two-Oscillator Model

A. Johnsson

11:15 – 12:00 Free papers I: G-Stress

Chairmen: T. Chelette, H. Hinghofer-Szalkay

11:15 Polychromatic Percepts during Hypergravity

T. Chelette, R. Allnutt, L. Tripp, D. Post

11:30 Importance of Somatosensory Input for Spatial Orientation in Supine Subjects: Evaluated by Pointing Arm-movements during Linear Acceleration

Y. Chen, S. Mori

11:45 Use of Artificial Gravity in Spinal Cord Injury

D. Cardús, T. Schlegel, E. Benavides

12:00 – 13:30 Lunch

13:30 – 16:05 Free papers I: G-Stress (cont.)

Chairmen: T. Chelette, H. Hinghofer-Szalkay

13:30 Influence of Posture on the Humoral and Kidney Response to an Oral Salt Load

C. Drummer, C. Hesse, A. Boerger, G. Wolfram, M. Heer

13:40 Is Body Sodium Storage Possible without Body Fluid Retention?

M. Heer, F. Baisch, N. Kamps, C. Hesse, C. Korr, C. Biener, A. Boerger, C. Drummer

13:50 Pain in the Arms Induced by Markedly Increased Intravascular Pressures Decreases after Repeated Exposures to Moderately Increased Intravascular Pressures

O. Eiken, R. Kölegård

14:05 High-energy-Phosphates Measured by ³¹P-MRS During LBNP in Exercising Human Leg Muscle

S. Baerwalde, J. Zange, K. Müller, N. Maassen

14:20 Hypergravity Effects on Rodent Pregnancy and Parturition: Maternal Experience Improves Birth Outcome and Early Postnatal Survival

A. E. Ronca, L. A. Baer, N. G. Daunton, E. M. Sajdel-Sulkowska, C. E. Wade

14:35 Hypergravity Effects on Body and Organ Mass of Lactating Rat Dams and their Offspring from Birth to Weaning

L. A. Baer, A. E. Ronca, N. G. Daunton, E. Sajdel-Sulkowska, C. E. Wade

15:50 Gravitational Effects on Insect Circadian Activity Rhythms
T. M. Hoban-Higgins, A. M. Alpatov, G. T. Wassmer, C. A. Fuller

15:05 A Plant's Response to Gravity as a Wave Phenomenon
O. E. Wagner

15:20 – 15:35 Coffee break

15:35 Detection of Apoptosis in Chloroplasts and Nuclei in Different Gravitational Environments
M. C. Pedroso, D. Durzan

15:50 Gravity, Injury, Calcium and Gene Expression in Aequorin-Expressing Plants
E. Davies, B. Shimps, B. Stankovic

16:05 – 17:00 Free papers II: Biotechnology
Chairmen: F. J. Baisch, C. Gharib

16:05 Meeting the Challenge: A Survey of Capabilities Planned to Meet Future Space Biology Research Needs
B. Yost, K. Souza, C. Wade, P. Davies

16:20 Development and Validation of a Segmental Bioelectrical Impedance Method
F. J. Baisch, M. Heer, C. Hesse, I. Störmer, M. Kentsch, H. U. Klehr, C. Drummer, G. Wolfram

16:30 Blood Arterial Pressure and Heart Rate Measurements by Telemetry during Simulated Microgravity in Rat
L. Somody, S. Blanc, E. Pereira De Souza Neto, J. Frutoso, C. Gharib, G. Gauquelin-Koch

16:45 Laser Induced Fluorescence as an Indicator of Cellular Metabolic Activity
M. Principato, B. D. Lawless

17:00 – 18:00 Poster session I

Tuesday, June 8, 1999

08:00 – 11:20 Symposium II: Neuroscience

Chairmen: T. Mano, B. Cohen

08:00 The Vestibular System in Weightlessness: Spatial Orientation and Perception of Tilt

B. Cohen

08:25 Anatomical Studies of Rat Cerebellar Cortex Harvested During Adaption to Microgravity

G. R. Holstein

08:50 Responses of Vestibular Otolithic Organs in Microgravity

S. M. Highstein

09:15 Orthostatic Tachycardia and the Autonomic Nervous System

D. Robertson

09:40 Does Microgravity Cause Global Degradation of the Human Cardiovascular Control Mechanisms?

C. G. Blomqvist

10:05 – 10:30 Coffee break

10:30 Influence of Microgravity on the Baroreflex Modulation of Human Sympathetic and Vagal Neural Outflows

J. F. Cox

10:55 Development of the Aortic Baroreflex System under Conditions of Microgravity

T. Shimizu

11:20 – 12:05 Free papers III: Neuroscience

Chairmen: F. Strollo, N. J. Christensen

11:20 Space Flight Influences The Development of Locomotion in Neonatal Rats

D. Sulica, K. Walton

11:35 Inflight Changes of Ultrastructure in Cerebellar Nodulus of the Rats Flown in Space

I. B. Krasnov

11:50 Short Term Plasticity in Primary Somatosensory Cortex of the Rat after Hindlimb Suspension
C. Langlet, M. H. Canu, F. Piquet, M. Falempin

12:05 – 13:30 Lunch

13:30 – 15:15 Free papers III: Neuroscience (cont.)
Chairmen: F. Strollo, N. J. Christensen

13:30 Alteration of Motor Units Composition in the Rat Soleus Muscle after 14 Days of Hindlimb Unloading
F. Picquet, C. Langlet, M. H. Canu, M. Falempin

13:45 Effects of Hyper +Gz Acceleration on Brainstem and Auditory Cortical Evoked Potentials and Cerebral Blood Flow in Anesthetized Rats
K. Matsunami, T. Konishi, H. Satake

14:00 About Possible Role of the Cerebellum in Postural Control in State of Microgravity
R. A. Grigorian, A. N. Razumeev, G. S. Aizikov, Yu. Kreidich, V. I. Mazur

14:15 Modelling Basic Features of Cerebellar Dynamics
M. G. Velarde

14:30 Gender Affects the Pattern of Neuroendocrine Response to Head-Up Tilt
F. Strollo, M. Morè, L. Bollanti, A. Ciarmatori, E. Longo, A. Mambro, S. Di Paolo, N. Mangrossa, G. Strollo, G. Riondino, A. Scano

14:45 Neuroactive Drugs: Personal Preference Method for Support in Space Operations
N. G. Lacota, V. S. Shashkov

15:00 Effects of Neuroactive Drugs during Space Mission
N. G. Lacota, G. M. Strelalov

15:15 – 15:35 Coffee break

15:35 – 17:00 Free papers IV: Microgravity

Chairmen: N. Adamchuk, Y. Suzuki

15:35 Physiologic Changes Noted in Astronaut Participants in Russian Mir Missions

C. F. Sawin

15:50 Optimal Hypogravity: A Panacea in Manned Spaceflights?

Kh. Muradian

16:05 Spaceflight and the Risk of Renal Stones

P. A. Whitson, R. A. Pietrzyk, C. F. Sams

16:20 Haematopoietic, Thrombopoietic and Vascular Endothelial Growth Factor in Space - A Case Report from the Russian Mir Station

H.-C. Gunga, K. Kirsch, L. Röcker, W. Jelkmann

16:35 Arterial Pressures in Humans during Weightlessness Induced by Parabolic Flights

B. Pump, R. Videbæk, A. Gabrielsen, P. Norsk

16:45 Changes in Muscle Sympathetic Nerve Activity and Effects of Breathing Maneuvers in Humans during Microgravity induced by Parabolic Flight

S. Iwase, C. Jian, H. Kitazawa, A. Kamiya, S. Miyazaki, Y. Sugiyama, C. Mukai, M. Kohno, T. Mano, S. Nagaoka

17:00 – 18:00 Poster session II

Wednesday, June 9, 1999

08:00 – 10:30 Symposium III: G-Factor as a Tool in Basic Research and Space Based Biotechnology

Chairmen: E. Ilyin, M. J. Katovich

08:00 The Mechanisms of Orthostatic Tolerance

V. A. Convertino

08:25 The Significance of Muscle Plasticity Studies in Real or Simulated Microgravity for a Better Understanding of Fundamental Physiological Issues

Y. Mounier

08:50 The G-Factor as a Tool to Learn More about Bone Structure and Function

E. Zerath

09:15 The Interaction of Sensory Systems: The Lessons From Space Research

B. Cohen

09:40 The Effects of Long-term Simulated Hypogravity on Cultured Human Endothelial Cells

L. B. Buravkova

10:05 The Use of Microgravity for Receiving The Bioproducers with New Properties

G. S. Nechitailo

10:30 – 11:00 Coffee break

11:00 – 12:00 Free papers IV: Microgravity (cont.)

Chairmen: N. Adamchuk, Y. Suzuki

11:00 The Effect of Spaceflight on Cartilage Cell Cycle and Differentiation

S. B. Doty, W. G. Telford

11:15 Morpho-Functional Adaptions in A Bone Tissue Under the Space Flight Conditions

N. V. Rodionova, V. S. Oganov, L. M. Murashko

11:30 Performance of an Aquatic Ecosystem in Space
D. Voeste, M. Andriske, F. Paris, H. G. Levine, V. Blüm

11:45 Rearing in Microgravity Causes an Increased Number, but Not Size, of Statoconia in the Pond Snail Statocyst
M. L. Wiederhold, J. L. Harrison, C. A. Ortiz

12:00 – 13:30 Lunch

13:30 – 14:45 Free papers IV: Microgravity (cont.)
Chairmen: N. Adamchuk, Y. Suzuki

13:30 Sea Urchin Fertilization during an Aircraft Parabolic Flight and Spaceflight Effects on Fertilization, Cell Division, Calcium Metabolism, and Development
H. Schatten, S. Zoran, H. Levine, K. Anderson, M. Runco, A. Chakrabarti

13:45 Ultrastructural Observations of Chloroplast Morphology in Space-Grown Brassica Rapa Cotyledon Tissue
S. Jiao, E. Hilaire, A. A. Paulsen, E. L. Kordyum, J. A. Guikema

14:00 Carbohydrate Metabolism and Starch Structure in Space-Grown Plants
C. S. Brown, M. M. Sanwo-Lewandowski, O. A. Kuznetsov, K. H. Hasenstein

14:15 Ultrastructural Organization of Cells in Soybean Root Tips in Microgravity
D. O. Klymchuk, C. S. Brown, D. Chapman

14:30 Measuring Drosophila (Fruit Fly) Activity during Microgravity Exposure
M. S. Miller, T. S. Keller

14:45 – 17:00 Free papers V: Simulation
Chairmen: I. B. Kozlovskaya, L.-F. Zhang

14:45 The Effects of Long-Term Simulated Hypogravity on the Human Cultured Endothelial Cells
L. B. Buravkova, Y. A. Romanov

15:00 Human T Cell Activation Studies

D. Bogyo, C. Sams

15:15 – 15:45 Coffee break

15:45 Assessment of 24-hours Sympathoadrenal Activity in Humans during Head-Down Tilted Bed Rest: Implications for Spaceflight

N. J. Christensen, P. Norsk, M. Hammerum, Y. Suzuki

16:00 Sympathetic Vasoconstriction and Orthostatic Intolerance after Simulated Microgravity

A. Kamiya, S. Iwase, D. Michikami, Q. Fu, T. Mano

16:15 Preservation of Veno-Arteriolar Reflex in the Skin following 20 days of Head Down Bed Rest in Humans

A. Gabrielsen, Y. Suzuki, P. Norsk

16:30 LBNP-induced Changes in Plasma cGMP with and without Head Down Tilt Bed Rest

H. Hinghofer-Szalkay, Z. László, A. Rössler, B. Haditsch, U. Wöllik, A. Rothaler

16:45 Decreased Redundancy of Autonomous Cardiovascular Regulations with Hypertension during Orthostasis in Active-Living Elders

Y. Haruna, J. S. Lee, K. Kawakubo, Y. Suzuki

17:00 – 18:00 Poster session III

19:30 Gala Dinner

Grosvenor Resort Hotel

Thursday, June 10, 1999

08:00 – 10:25 Symposium IV: Spaceflight and Aging

Chairmen: K. A. Kirsch, R. J. Hughes

08:00 Aging and space - a real problem?

K. A. Kirsch

08:10 Endocrinology during aging and its relation to space

F. Strollo

08:40 Bone and muscle – aging and space

J. Rittweger

09:10 Aging and space flight findings from the University of Pittsburgh

T. H. Monk

09:35 Sleep in space: A circadian perspective

D.-J. Dijk

10:00 Sleep and circadian adaptation to space flight: Evaluation in an older astronaut

R. J. Hughes

10:25 – 10:55 Coffee break

10:55 – 11:55 Free papers V: Simulation (cont.)

Chairmen: I. B. Kozlovskaya, L.-F. Zhang

10:55 Influences of Thigh Cuffs on Volume Regulating Hormones during a 7-days Head Down Bed Rest

C. Millet, M. A. Custaud, A. M. Allevard, C. Gauquelin, S. Blanc, C. Gharib, J. O. Fortrat

11:10 A Comparison of the Effects of Lower Body Positive Pressure and Head-Down Tilt on Cardiovascular Responses in Humans

Q. Fu, Y. Sugiyama, A. Kamiya, T. Mano

11:25 Effects of Venous Constrictive Thigh Cuffs on Plasma Volume, Orthostatic Tolerance and Autonomic Influences during a 7-days Head Down Bed Rest

M. A. Custaud, C. Millet, J. Frutoso, A. Maillet, G. Gauquelin, A. Güell, C. Gharib, J. O. Fortrat

11:40 Contributory Factors to Orthostatic Intolerance After Simulated Weightlessness

A. Pavy-Le Traon, F. Louisy, P. Vasseur-Clausen, J. O. Fortrat, A. Güell, C. Gharib

11:55 – 13:30 Lunch

13:30 – 16:45 Free papers V: Simulation (cont.)

Chairmen: I. B. Kozlovskaya, L.-F. Zhang

13:30 The Arterial Baroreflex during and after 120 Days Bed-Rest

J. Spaak, P. Sundblad, D. Linnarsson

13:45 Effect of 6 Weeks Head-Down Strict Bed-Rest on Cardiovascular Responses to Light Exercise in Supine and Upright Positions

P. Sundblad, J. Spaak, D. Linnarsson

14:00 Dynamics of Blood Pressure and Pulse Interval Duration in Rats after 14 Day Suspension

I. Kharchenko, O. Tarasova, A. Borovik, O. Vinogradova

14:15 Role of Peripheral Effector Mechanisms in Spaceflight Cardiovascular Deconditioning

L.-F. Zhang, Z.-B. Yu, J. Ma

14:30 Angiotensin-(1-7) Antagonist [D-Ala⁷-Ang-(1-7);A-779] Attenuates Post-suspension Hypotension in Sprague-Dawley Rats

M. A. Bayorh, M. Wang, R. R. Socci, D. Eatman, N. Emmett, M. Thierry-Palmer

14:45 Relatively Shorter but Intensive Isotonic Exercise in Legs Prevented the Decrease in Maximal Aerobic Power after 20 Days of Head Down Tilt Bed Rest in Man

Y. Suzuki, Y. Haruna, H. Akima, T. Fukunaga, A. Gunji

15:00 Modulation of Sarcolemma Cholesterol Content during Muscle Unloading

M. S. F. Clarke, M. M. Bamman, D. L. Feedback

15:15 – 15:45 Coffee break

15:45 Influence of Single Hindlimb Support on Skeletal Muscle Characteristics during Simulated Weightlessness in the Rat

T. L. Nemirovskaya, B. S. Shenkman

16:00 Effect of Hypogravity on the Electrical Characteristics and on the Mechanical Threshold of Rat Fast and Slow Twitch Muscle Fibers

S. Pierno, A. De Luca, J.-F. Desaphy, A. Liantonio, D. Conte Camerino

16:15 Leptin and Fuel Homeostasis During a 7 Day Bed Rest

S. Blanc, S. Normand, A. M. Allevard, G. Gauquelin, J. O. Fortrat, C. Gharib

16:30 Degraded Diet Induced Thermogenesis Induced by 20-days 6° Head-Down Bed Rest and the Effect of Resistance Training

M. Oba, K. Kawakubo, J. S. Lee, Y. Haruna, Y. Suzuki, A. Gunji

17:00 – 18:00 Poster session IV

Friday, June 11, 1999

9:00 – 15:30 Regional Tour to Kennedy Space Center

POSTER SESSIONS

Monday, June 7, 1999

17:00 – 18:00 Poster session I

1. **Effects of the Thigh-Cuffs on the Carotid Artery Diameter, Jugular Vein Section and Facial Skin Edema: A HDT Study.**
P. Arbeille, S. Diridollou, S. Herault, G. Fomina, J. Roumy, I. Alferova
2. **Model Based Classification of Cardiovascular Response Patterns**
A. Asteroth, J. Frings, T. Kunze, K. Möller
3. **Development of a Spaceflight-Compatible Device to perform WBC Surface Marker Staining and Mitogenic Activation for Cytokine Detection by Flow Cytometry**
B. E. Crucian, C. F. Sams
4. **Physiological Aspects of higher Plant Functioning in Closed Ecosystems**
E. Golovko, T. Cherevchenko
5. **Diurnal Height Variation in Growth of Children: Effects of Gravity**
M. Kobayashi, M. Kobayashi, T. Tanaka, Y. Uchiyama, M. Togo
6. **Structure and Function of Otoliths. Unresolved Issues**
A. V. Kondrachuk, P. Steyger
7. **Ontogenesis of Natural and Artificial Gravity-Sensing Organs**
J. E. Love, K. M. Johnson
8. **A Multi-Element, Nonlinear Mathematical Model of Human Circulatory-Respiratory System and Its Applications in High-G Physiology**
H.-B. Lu, J. Bai, L.-F. Zhang
9. **Changes in Membrane Lipids and Polyamine Levels in Human Erythroleukemia K562 Cells Subjected to Altered Gravity**
M. Maccarrone, M. Bari, A. Finazzi Agrò

10. **Body Weight, Fat Pad and Leptin Reductions in Response to Incremental Gravitational Loads**
M. M. Moran, T. Wang, L. Baer, F. Yuan, C. Wade
11. **Gaseous Exchange, Body Temperature, RNA and Protein Synthesis and Survival of Young and Old Mice at Acute Hypergravity**
Kh. Muradian, T. Mozhukhina
12. **Comparison of Sympathetic Nerve Response to Head-up Tilt in Summer and Winter**
Y. Niimi, T. Matsukawa, Y. Sugiyama, A. S. M. Shamsuzzaman, T. Mano
13. **Influence of Changes in Gravity on the Response of Lung and Vascular Cells to Ischemia/Reperfusion in Vitro**
G. L. Sanford, S. Harris-Hooker, J. Lui, C. Melhado-Gardner, Y. Pink, T. Wallace
14. **Wound Healing Following Injury to Vascular Smooth Muscle Cell Cultures is Modulated by Culture under Hypergravity**
G. L. Sanford, S. Harris-Hooker, J. Lui, F. N. Bosah
15. **Gravity-Dependent Modulation of Ia Afferent in Human**
T. Sato, H. Sekiguchi, T. Kimura, D. Nozaki, K. Nakazawa, H. Yano, H. Takeoka

Tuesday, June 8, 1999

17:00 – 18:00 Poster session II

1. **Structural and Functional Changes of Photosynthetic Membranes of Brassica Rapa 6-9 Days Seedlings Induced by Microgravity**
N. I. Adamchuk, J. A. Guikema
2. **Structure and Function of Brassica Rapa Mesophyll Cells in Seedling Grown under Conditions of Microgravity**
N. I. Adamchuk, S. Jiao, E. Hilaire, J. A. Guikema

3. **Spaceflight Effects on Structural and some Biochemical Parameters of Brassica Rapa Photosynthetic Apparatus**
N. I. Adamchuk, N. F. Mikhaylenko, O. I. Volovik, E. K. Zolotareva
4. **Influence of Intermittent Hypoxia on the Osteogenesis in Rats.**
V. A. Berezowskiy, I. G. Litovka, H. G. Chaka
5. **Sympathetic Response to Horizontally Linear Acceleration in Humans**
J. Cui, S. Iwase, T. Mano, N. Katayama, S. Mori
6. **Influence of Hypergravity on Intracerebral Stresses Assuming the Brain as Heterogeneous**
A. Guillaume, D. Osmont, D. Gaffie, J. C. Sarron, P. Quandieu
7. **Development of Vestibular Reflexes in Neonatal Rats is Influenced by Sixteen Days of Space Flight**
S. Harding, D. Anshel, T. Harris, K. Walton
8. **Regulatory Changes at High Altitudes in Comparison with Post-Space-Flight Reactions**
B. Johannes, V. P. Salnitski, H.-C. Gunga, F. Fischer, K. Kirsch
9. **Elicitation of Otolithic Nystagmus by Step and Sinusoidal Modes of Linear Acceleration (Gy) in Humans**
N. Katayama, S. Mori
10. **Theoretical Evaluation of the High Gradient Magnetic Field Effects on the Roots**
A. V. Kondrachuk
11. **Muscle Stretching – Countermeasures to Space Deconditioning?**
Yu. Koryak
12. **Structural-Functional Peculiarities of Lepidium Sativum Root Apex Cell Nucleoli under the Conditions of Altered Gravity**
M. A. Sobol
13. **Energy Balance during Space Flight on the Shuttle: Validation of Methodologies**
T. P. Stein, M. J. Leskiw, M. D. Schluter, R. Gretebeck, H. W. Lane, R. W. Hoyt, A. D. LeBlanc

14. **Effects of 2G on Uncoupling Protein₁ in Lean and Obese Zucker Rats**
L. E. Warren, B. A. Horwitz, C. A. Fuller
15. **Effect of Centrifugation at 2G on Sympathetic Mediated Systems in the Rat**
F. Yuan, M. Moran, L. Baer, T. Wang, W. Belisle, C. Wade

Wednesday, June 9, 1999

17:00 – 18:00 Poster Session III

1. **The Effect of Simulated Microgravity Conditions on the TNF-Alpha Production by Human PBMCS**
L. Bátkai, A. Várkonyi, J. Minárovits
2. **Biological Mechanisms of Regulation of Growth Processes in Orchids under the Conditions of Clinostating**
T. Cherevchenko, N. Zaimenko
3. **Characteristics of Troponin C in Slow and Fast Muscles after Unloading Conditions**
P. Kischel, B. Bastide, L. Stevens, Y. Mounier
4. **The Influence of Microgravity on Plant Cells Cultured in Vitro**
D. O. Klymchuk, G. M. Martyn, H. G. Levine
5. **DNA Content and Differentiation of Root Apical Cells of Brassica Rapa Plants Grown in Microgravity**
E. L. Kordyum, G. I. Martin, V. A. Zaslavsky, E. Hilaire, J. A. Guikema
6. **Ternary Test of Human Tolerance Prediction in Unload Space**
N. G. Lacota, I. M. Larina
7. **Change-Over Coordination Structure of Astronauts' Voluntary Movements during Orbital Flight Conditions**
A. N. Laputin, L. K. Kadenyuk

8. **The Nature of Altered Femoral Arterial Responsiveness in 4-week Simulated Microgravity Rats**
J. Ma, L.-F. Zhang, L.-N. Zhang
9. **Electron-Cytochemical Study of Ca⁺⁺ in Cotyledons of Soybean-Grown in Microgravity**
O. Nedukha, C. Brown, E. Kordyum, W. Piastuch
10. **Effects of Microgravity on Ultrastructure of Root Meristem of Soybean Seedlings Grown with Pathogenic Fungus**
O. Nedukha, J. Leach, E. Kordyum, M. Ryba-White, J. Guikema, E. Hilaire, A. Paulsen, C. Brown, W. Piastuch
11. **Clonogene Activity of Osteogene Cells-Precursors of Human Bone Marrow Tissue under Reduced Partial Pressure of Oxygen**
L. M. Panchenko, I. A. Khasabova, V. A. Berezovsky, V. S. Astakhova
12. **Calcium Ions are Important for Gravisensing of Tip-Growing Plant Cells**
G. Shevchenko
13. **Changes of Fos Expression in the Medulla Oblongata and Neuron Size in the Intermediolateral Nucleus of the Spinal Cord during Simulated Weightlessness**
C.-J. Su, L.-F. Zhang, Z.-R. Rao, J.-X. Bao
14. **Some Characteristics of Photosynthetic Apparatus under Conditions of Spaceflight**
O. I. Volovik, E. L. Kordyum, J. A. Guikema

Thursday, June 10, 1999

17:00 – 18:00 Poster session IV

1. **Photosynthetic Apparatus of Pea Leaves under Clinorotation Conditions**
N. I. Adamchuk, R. N. Fomishina, N. F. Mikhaylenko, E. K. Zolotareva

2. **Comperative Analysis of Age- and Species-Specific Differences in Acute Hypergravity Tolerance in Laboratory Mammals**
V. Frolkis, A. Timchenko, Kh. Muradian
3. **Vasomotor Sympathetic Nerve Responses to Static Handgrip After Simulated Microgravity**
D. Michikami, A. Kamiya, S. Iwase, Q. Fu, T. Mano
4. **Effect of Altered Gravity on the Mitochondria Ultrastructure, Activity and Fractional Content of Succinatedehydrogenases in Chlorella Cells**
A. F. Popova
5. **Age Related Responses to Autonomic Cardiovascular Tests**
G. Raimondi, J. M. Legramante, F. Iellamo, F. Micozzi, S. Sacco, R. Balocchi, S. Chillemi, G. Peruzzi
6. **Effects of Long-Term Bedrest on Volume and Fiber Size in Human Skeletal Muscles**
B. S. Shenkman, A. Leblanc, I. Belozeroва, T. Nemirovskaya, S. Ternovoy, A. Bacharev, R. Rowe, C. Lin
7. **Metabolic Cost of Exercise and Muscle Mitochondrial Characteristics in Men Exposed to Long-Term Bedrest With and Without Countermeasure Application**
B. S. Shenkman, M. Mazin, E. Kiseleva, T. Nemirovskaya, I. Belozeroва, E. Tikhomirov
8. **Changes in Body Fluid Distribution during 7-days 6° Head-Down Bed Rest**
M. Sudoh, C. Sekiguchi, S. Kurihara
9. **Effect of Clinorotation on the Changes of Some Parameters of Photosynthetic Apparatus, Induced by Phosphorylation of Chloroplast Membrane Proteins**
S. K. Sytnik, O. I. Volovik
10. **Effect of Acute and Life-long Hypergravity on Survival, Rates of Metabolism and Age-Dynamics of Mortality in *D. melanogaster***
A. Timchenko, Kh. Muradian

- 11. Effects of Long-Term Bed Rest on H-Reflex and Motor Evoked Potential in Lower Leg Muscles during Standing**
K. Yamanaka, S.-I. Yamamoto, K. Nakazawa, H. Yano, Y. Suzuki, T. Fukunaga
- 12. Obvious Ultrastructural Changes in Basilar Arterial Wall of 4-wk Simulated Weightlessness Rat**
L.-N. Zhang, Q.-W. Mao, L.-F. Zhang
- 13. The Effect of Microgravity on Proton Permeability of Thylakoid Membranes and Contribution of II and I Photosystems in Photosynthetic Electron Transport in Pea Chloroplasts**
E. K. Zolotareva, E. B. Onoiko, S. K. Sytnik