



**5th INTERNATIONAL
HEAD-OUT WATER IMMERSION SYMPOSIUM:
RESEARCH SIMULATIONS TO MODEL MICROGRAVITY
October 8–9, 2002**

Center for Advanced Space Studies
3600 Bay Area Boulevard
Houston, Texas

**Final Program
October 4, 2002**

Tuesday, October 8, 2002

07:45 – 08:30 Great Room	Registration	
08:45 – 08:50 Lecture Hall	Welcome	Organizing Committee
08:50 – 09:30	Opening Plenary International Space Station Science	N.R. Pellis, Ph.D. NASA Johnson Space Center
09:30 – 11:45	Session I – Autonomic Regulation	C. Lundgren, M.D., Ph.D. and A. A. Taylor, M.D., Ph.D., Co- Chairs
09:30 – 09:45	The Autonomic Nervous System and Cardiovascular Pathophysiology: A Review of Significant Interactions	A.A. Taylor Abstract
09:45 – 10:00	Potential Application of Confocal Microscopy to Monitor Ocular and Systemic Physiology and Pharmacokinetics in Low Gravity	F.A. Lattanzio, Jr., P.B. Williams Abstract
10:00 – 10:15	Sympatho-Vagal Responses in Humans to Thermoneutral Head-Out Water Immersion	C. Miwa, S. Iwase, T. Mano, Y. Sugiyama Abstract
10:30 – 10:45 Great Room	Break	
10:45 – 11:00	Changes in Muscle Sympathetic Nerve Activity After 6, 14, and 120 Days of -6° Head-Down Bedrest in Humans	S. Iwase, A. Kamiya, H. Kitazawa, D. Michikami, Q. Fu, C. Jian, Y. Sugiyama, T. Mano, O.L. Vinogradova, I.B. Kharchenko Abstract
11:15 – 11:30	Change in Muscle Sympathetic Nerve Activity in Humans and Effect of Breathing Maneuvers During Short Periods of Microgravity Produced by Parabolic Flight	S. Iwase, T. Mano, J. Cui, H. Kitazawa, A. Kamiya, S. Miyazaki, Y. Sugiyama, C. Mukai, S. Nagaoka Abstract
11:30 – 11:45	Thermal Stimulation by a Cooling/Warming Garment to Increase Blood Circulation in the	V.S. Koscheyev, A. Coca, G. Leon Abstract

	Lower Limbs in Head Tilt Conditions	
12:00 – 13:00 Berkner Rooms	Lunch	
13:30 – 15:15 Lecture Hall	Session II – Neural Control of Blood Pressure	T. Mano, M.D., Ph.D. and M.A. Custaud, M.D., Co-Chairs
13:30 – 13:45	Comparison of Acute Effects of Water Immersion and Weightlessness on Cardiac Output in Humans	P. Norsk, M. Gybel, L. Petersen Abstract
13:45 – 14:00	Neural Control of Blood Pressure During Lower Body Positive Pressure	Q. Fu, S. Iwase, Y. Niimi, A. Kamiya, T. Mano Abstract
14:00 – 14:15	Effect of Short-Term Bed Rest on Regulation of Arterial Blood Pressure	R.L. Hughson, J.K. Shoemaker, M.R. Edwards, Z.L. Topor, D.D. O’Leary Abstract
14:15 – 14:30 Great Room	Break	
14:30 – 14:45	Comparison of the Effects of Space Flight and Head Down Bed Rest on the Autonomic Nervous System	M.A. Custaud, E. Belin de Chantemele, I. Fontova, A. Kotovskaia, A. Güell, C. Gharib Abstract
14:45 – 15:00	Biomechanical Insights into the Maintenance of Orthostatic Tolerance: When Cardiac Replacement and Space Flight Fly Together	G.M. Pantalos, R.W. Fasciano, R.T.V. Kung, R.D. Dowling, L.A. Gray Abstract
15:00 – 15:15	Assessing Interactions Between Arterial Blood Pressure and Arterial PCO ₂ in Regulating Cerebral Blood Flow with Postural Challenge	M.R. Edwards, J.K. Shoemaker, R.L. Hughson Abstract
15:30 – 15:45 Great Room	Break	
16:00 – 17:15 Lecture Hall	Session III – Spaceflight Physiology	H. Hinghofer-Szalkay, M.D. and G. Pantalos, Ph.D., Co-Chairs
16:00 – 16:15	Pressure Mechanotransduction in Isolated Resistance Arteries	D.C. Rice, P.B. Williams, C.M. Lathers Abstract
16:15 – 16:30	Combined Gravitational and Lower Body Pressure Stimulation: Identification of Neutralizing Stimulus Pairs	H.G. Hinghofer-Szalkay, I. Loder, K. Pilz, D. Jezova Abstract
16:30 – 16:45	The Hearts in Space Project: A 17-Year Review of Student-Based Investigations into Cardiovascular	G.M. Pantalos, M.K. Sharp, T.E. Bennett, and a Constellation of Creative and

	Response to Space Flight	Dedicated Students! Abstract
16:45 – 17:00	Necessity for the Development of a Safe and Effective Pharmacological Agent to Protect Astronauts from the Effects High Energy Low Linear Energy Transfer (LET) Radiation Exposure	J.A. Smith, C.M. Lathers, F.H. Hausheer Abstract
17:00 – 17:15	Use of Midodrine as a Countermeasure to Post-Spaceflight Orthostatic Intolerance	J. Meck Abstract
17:30 – 18:30	Transport to Nassau Bay Hilton/CASS	
18:30 – 20:00 Great Room	Session IV – Poster Session/ Reception	
	Stress Management of Patients on Earth and Astronauts Working in Space	P.L. Schraeder, C.M. Lathers Abstract
	Effect of Mission Duration on Stress Hormone Levels and Leukocyte Subsets	R.P. Stowe, D.L. Pierson Abstract
	Ground-Based Biological Mechanistic Studies and Predictive Modeling to Improve Extrapolation of Animal Data to Humans in 0-G	C.M. Lathers, D.C. Rice, P.B. Williams Abstract
	Central Autonomic Neural Control of Sleep and Awakening Processes Abstract	A.R. Morrison, C.M. Lathers Abstract
	Terahertz-Rays: New Technique to Model Bone Degradation and to Develop and Predict Countermeasure Effectiveness for Long Duration Space Flight to Mars?	C.M. Lathers, B. Ferguson, S. Wang, T. Yuan, X.-C. Zhang Abstract
	New Drug Model to Use Individual Bioequivalence to Predict Pharmacological Drug Levels in Astronauts: In Vivo and In Vitro Pharmacokinetic Correlations of Ground-Based Values for Space Flight	C.M. Lathers, G.L. Drusano Abstract
	A Novel Mathematical Model to Investigate Oral Bioavailability in Humans on Earth and During Space Flight	C.M. Lathers, A.K. Mitra, R.W. Piepho, D. Pal, S. Majumdar, J. Patel, B. Balasubrahmanyam Abstract
	Development of a Rabbit Model to Study Pathogen Resistance:	R.M. Levin, C.M. Lathers, H.L. DuPont, P.C. Okhuysen, Z.-D.

	Relevant to Food Borne Disease and Space Flight	Jiang Abstract
	A New Rabbit Bladder Model to Study Pharmacological and Molecular Mechanisms of Bacterial Infections and Resistance Relevant to Food Borne Diseases and Space Flight	C.M. Lathers, R.M. Levin, H.L. DuPont, P.C. Okhuysen, Z.-D. Jiang Abstract
	Space Flight Risk Assessment Model for Risk Assessment on Earth	C.M. Lathers, M. Bonner Abstract
	Earth Protection and Space Travel Implications for Health Risk Assessment	M. Bonner, C.M. Lathers Abstract
	Maturity and Space Flight: A Risk-Benefit Analysis Approach	M. Bonner, M.J.L. Bonner Abstract
20:00 – 20:30	Transport to Nassau Bay Hilton	

Wednesday, October 9, 2002

08:00 – 08:30 Great Room	Registration continues	
08:30 – 09:45 Lecture Hall	Session V – Ground-Based Models for Space Flight	C. Lathers, Ph.D., and A.D. LeBlanc, Co-Chairs
08:30 – 08:45	Mean Left Atrial Pressure Measured Noninvasively in Simulated Microgravity	C. Lundgren, T. Taraldsøy, T. Edstrøm, I. Tyssebotn, D. Hickey Abstract
08:45 – 09:00	Alterations in Protein Metabolism During Space Flight and Inactivity	A.A. Ferrando, D.J. Paddon-Jones, R. R. Wolfe Abstract
09:00 – 09:15	Changes in Bone Physiology During Horizontal Bed Rest and Microgravity	A. LeBlanc, L. Shackelford, V. Schneider, T. Driscoll, H. Evans Abstract
09:15 – 09:30	Space Flight, Head-Out Water Immersion, and Renal Disease: Better Models Needed to Understand Mechanistic Changes	C.M. Lathers Abstract
09:30 – 09:45	Ground-Based Model for Perceptual and Sensorimotor Adaptation to Space Flight: A Candidate Countermeasure	D.L. Harm Abstract
10:00 – 10:15 Great Room	Break	
10:30 – 12:15 Lecture Hall	Session VI – Dry Immersion	I. Kozlovskaya, M.D., Ph.D. and C. Sawin, Ph.D., Co-Chairs
10:30 – 10:45	Dry Immersion as a Powerful Tool in Studies of Sensory-Motor Effects of	I.B. Kozlovskaya Abstract

	Microgravity	
10:45 – 11:00	Changes of Reflex Amplitude in Dry Water Immersion	W. Struhal, M. Berger, F. Gerstenbrand, S. Golaszewski, S. Lechner-Steinleitner Abstract
11:00 – 11:15	Sensorimotor Test in 48 Hours Dry Water Immersion (Arm Matching Test)	M. Saling, S. Lechner-Steinleitner, F. Gerstenbrand, W. Struhal, M. Berger Abstract
11:15 – 11:30 Great Room	Break	
11:30 – 11:45	Cerebral Activation Pattern Before and After Dry Water Immersion	S.M. Golaszewski, F. Gerstenbrand, W. Struhal, E. Gallasch, M. Berger, S. Lechner-Steinleitner, C.M. Siedentopf, S.R. Felber Abstract
11:45 – 12:00	Effect of Foot Support Zones Stimulation on Muscle Transverse Stiffness and Venous Compliance Under Conditions of Dry Immersion	O.L. Vinogradova, D.V. Popov, I.V. Saenko, I.B. Kozlovskaya Abstract
12:00 – 12:15	Effects of Three Days of Dry Immersion on Muscle Sympathetic Nerve Activity and Arterial Blood Pressure in Humans	S. Iwase, Y. Sugiyama, C. Miwa, A. Kamiya, T. Mano, Y. Ohira, B. Shenkman, A.I. Egorov, I.B. Kozlovskaya Abstract
12:30 – 13:30 Berkner Rooms	Lunch	
13:45 – 14:45	Session VII – Diseases on Earth and in Space	Peter Norsk, M.D. and P.C. Okuysen, M.D.
13:45 – 14:00	Mannose Binding Protein Gene Polymorphisms as Markers for Susceptibility to Infection with <i>Cryptosporidium</i>	P.C. Okhuysen, A. Tasi, Z.D. Jiang, H.L. DuPont, W.E. Bennett, D. Guo, T. King, D. Milewicz Abstract
14:00 – 14:15	Regulation of Fluid and Cell Volume during Simulated Microgravity and Space Flight	J.W. Lohr, C.M. Lathers Abstract
14:15 – 14:30	Head-Out Water Immersion and Hypertension: Lessons Learned for Space Flight	C.M. Lathers, J.W. Lohr Abstract
14:30 – 14:45	Renal Disease and Head-Out Water Immersion: Insights for Space Flight-Induced Physiological Changes	C.M. Lathers Abstract
14:45 – 15:00	Break	

Great Room		
15:00 – 16:45	Session VIII – Pharmacokinetics	G. Drusano, Ph.D. and A.K. Mitra, Ph.D., Co-Chairs
15:00 – 15:15	Pharmacokinetics in Ground-Based Studies: Implications for Space Flight	C.M. Lathers, J.A. Smith Abstract
15:15 – 15:30	Assessment of the Variability in Pharmacokinetic Parameters and Pharmacodynamic Responses in Microgravity Environments	J.A. Smith, C.M. Lathers Abstract
15:30 – 15:45	Use of Markov-Chain Monte Carlo Methods to Perform Stochastic Control in the Microgravity Environment Where Drug Concentration Information Is Sparse	G.L. Drusano, D.Z. D'Argento, C.M. Lathers Abstract
16:00 – 16:15 Great Room	Break	
16:15 – 16:30	Determining Appropriate Drug Doses in the Microgravity Environment for Agents Where the Toxic-Therapeutic Index Is Wide	G.L. Drusano Abstract
16:30 – 16:45	Antibiotic Therapy During Space Flights: A Disaster Bound to Happen? Use of Monte Carlo Simulations to Evaluate 1G Recommended Dosing Regimens of Ciprofloxacin in Microgravity	E.L. Schuck, V.A. Bhattaram, H. Derendorf Abstract
16:45 – 17:00	In Vitro/In Vivo Model to Assess Drug-Drug Interactions in Oral Bioavailability of Fluoroquinolone Antibiotics	A.K. Mitra, C.M. Lathers, R.W. Piepho, D. Pal, S. Majumdar, J. Patel, B. Balasubrahmanyam Abstract
17:00 – 17:30	Session IX: A Round Table Summary Discussion to Compare and Synthesize the Space Flight Models Presented Earlier	Session Chairs
17:30 – 18:30	Transport to Nassau Bay Hilton/Space Center Houston	
18:30 – 21:00	Gala Banquet Cash Bar Available	Space Center Houston
	STS-95 Experiences	Chiaki Mukai, M.D., Ph.D. NASDA Astronaut
21:00 – 21:30	Transport to Nassau Bay Hilton	