



# Human Physiology Workshop

5th of December 2020

*Online event*



# Human Physiology Workshop

We are pleased to welcome you to the 5th German Human Physiology Workshop 2020. The workshop shall provide a forum for researchers at all stages (student to professor) to meet and discuss their latest findings in human physiological research and space research and give room for mutual exchange and benefit between space and non-space scientists.

## Organizers

**Jörn Rittweger, Carina Arndt, Friederike Wütscher** (German Aerospace Center (DLR), Institute of Aerospace Medicine, Cologne)

**Katrin Stang, Michaela Girgenrath, Christian Rogon** (German Aerospace Center (DLR), Space Administration, Microgravity Research and Life Sciences, Bonn)

## Administrative secretariat

[humanphysiologie-ws@dlr.de](mailto:humanphysiologie-ws@dlr.de)

## Scientific Committee

<b>Markus Braun</b>	Deutsches Zentrum für Luft- und Raumfahrt (DLR), Raumfahrtmanagement, Forschung unter Weltraumbedingungen/Lebenswissenschaften, Bonn
<b>Peter zu Eulenburg</b>	LMU München
<b>Joachim Fandrey</b>	Universität Duisburg-Essen, Institut für Physiologie
<b>Nandu Goswami</b>	Medizinische Universität Graz, Institut für Physiologie, Gravitationsphysiologie und -medizin, Graz, Österreich
<b>Markus Gruber</b>	Universität Konstanz, Sensorimotor Performance Lab
<b>Pete Hodgkinson</b>	King's College London, Centre for Human & Applied Physiological Sciences, Großbritannien
<b>Ylva Hellsten</b>	Universität Kopenhagen, Department of Nutrition Exercise and Sports, Dänemark
<b>Jens Jordan</b>	Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Luft- und Raumfahrtmedizin, Köln
<b>Justin Lawley</b>	Universität Innsbruck, Institut für Sportwissenschaft, Österreich
<b>Anja Niehoff</b>	Sporthochschule Köln, Institut für Biomechanik und Orthopädie, Köln
<b>Jörn Rittweger</b>	Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Luft- und Raumfahrtmedizin, Muskel- und Knochenstoffwechsel, Köln
<b>Michele Salanova</b>	Charité Universitätsmedizin Berlin, Institut für Physiologie, Center for Space Medicine and Extreme Environments, Berlin
<b>Simon Schäfer</b>	Klinikum der Universität München
<b>Frank Weber</b>	Zentrum für Luft- und Raumfahrtmedizin der Luftwaffe, Fürstenfeldbruck
<b>Tobias Weber</b>	ESA, Köln

# Program

Saturday, December 5, 2020

9:00 **Welcome** (Markus Braun, Jörn Rittweger)

## Session 1:

**Chair: Peter Hodkinson, Julie Hides**

09:15 **De Gioannis, Riccardo:** Increased inspiratory carbon dioxide improves blood oxygenation during prolonged hypoxia exposure

09:30 **Köhlmoos, Anika:** Effect of synbiotic intake on liver lipid metabolism and their potential impact on non-alcoholic fatty liver disease

09:45 **Schreiber, Kristina:** Genetic variants in the prolinhydroxylase 2 gene and hypoxia tolerance: end-stage-lung-disease as a model for chronic, moderate hypoxia in long-term-space-flights

10:00 **Zuccarelli, Lucrezia:** Peripheral impairments of oxidative metabolism after a 10--day bed rest are upstream of mitochondrial respiration

**10:15–10:30 Break**

## Session 2:

**Chair: Gabriele Pfitzer, Dominik Pesta**

10:30 **Aebi, Mathias:** Cerebral and physiological responses to submaximal exercise in pilot trainees in various normobaric/hypobaric and normoxic/hypoxic conditions

10:45 **Marume, Kyohei:** Daily Generation of Footward Fluid Shift Attenuates cerebral hypoperfusion Associated with 3 days Head-Down Tilt Bedrest

11:00 **Schubert, Martin:** Myasthenia gravis, an autoimmune neurodegenerative disease, as an experimental model to investigate the effects of microgravity in skeletal muscle.

11:15 **Huber, Judita:** Inaugural quantitative analysis of perivascular spaces in long-duration space flyers

11:30 **Monti, Elena:** Early neuromuscular and contractile maladaptations to short-term bed rest

11:45 **Baldassarre, Giovanni:** Work rate decrease during exercise at a fixed submaximal heart rate: a new method to evaluate exercise (in)tolerance microgravity?

**12:00–12:45 Break**

### Session 3:

Chair: **Stefan Sammito, Jessica Koschate**

12:45 **Hinterwaldner, Luis:** Ankle joint immobilization using an unloading orthosis induces a muscle atrophy pattern that is similar to head down-tilt bedrest

13:00 **Klein, Timo:** Importance of exercise during short-term isolation

13:15 **Tran, Vienna:** Artificial gravity does not mitigate deconditioning of the gluteal muscles after prolonged head-down tilt bed rest

13:30 **De Martino, Enrico:** Intermittent short-arm centrifugation is a partially effective countermeasure against

13:45 **Henkel, Sara:** Resting energy expenditure (REE) of master athletes: Accuracy of predictive equations and primary determinants

**14:00–14:30 Break**

### Session 4:

Chair: **Mauro Marzorati, Kirsten Albracht**

14:30 **Thier, Nikolas:** Evaluation of ultrasound data from the MARES Sinusoidal Perturbation Protocol for the analysis of vibration-induced changes in fascicle length and pennation angle as a function of vibration frequency and muscular preload

14:45 **Eggelbusch, Moritz:** Skeletal muscle ultrastructural changes in myofibrillar morphology and nutrient storage after short- and long-term bed rest

15:00 **Marcos, David:** Cervical intervertebral disc expansion, vertebral compliance modulation and neck pain is induced by 4h of Hyper-Buoyancy Flotation and is only partially reversed by 15 mins re-exposure to gravity

15:15 **V. Wooten, Savannah:** Cardiovascular Sex-Differences in Master Athletes Determined by Echocardiography

**15:30 Invited Talk: Rolf Erdmann: How Space Exploration will be Boosted by Private Industry**

**16:00 Awards**

16:15 Adjourn