Monday, 26. July, 2021

13.00 – 14.00 Virtual get together

14.00 – 14.15 Ursula Wolf, ISOTT President, University of Bern, Switzerland
Welcome and introduction

Session: Brain 1 – Chair: Felix Scholkmann

14.15 – 14.30 Geisa Ortet, Case Western Reserve University, USA
Impaired cognitive performance in mice exposed to prolonged hyperoxia

14.30 – 14.45 Aarti Sethuraman, University of Tennessee Health Science Center, USA
Diet induced ketosis confers a pro-survival phenotype via HIF1α mediated interleukin 10 expression in mice brain

14.45 – 15.00 Takuma Sugash, The University of Electro-Communications, Japan
Long-term tracking of changes in microglial morphology during and after hypoxia adaptation in the mouse cortex

15.00 – 15.15 Victor Ochoa-Gutierrez, University of Glasgow, UK
Changes in oxygenation levels during moderate altitude simulation (hypoxia-induced): A pilot study towards diversity in oximetry

15.15 – 16.15 Poster session 1

P1.01. Sho Kojima, Niigata University of Health and Welfare, Japan
Relationship between exercise capacity and changes of cortical oxygenation immediately before maximal exercise during incremental exercise

P1.02. Fernando Arias-Mendoza, University of Pennsylvania, USA
Assessment of nicotine adenine dinucleotides in human tissues by in vivo phosphorus-31 magnetic resonance spectroscopic imaging at 1.5 Tesla

P1.03. Masaru Kanda, Niigata University of Health and Welfare, Japan
Intramuscular Circulation of Lumbar Multifidus in Different Trunk Positions in Standing

P1.04. Tim Hermans, KU Leuven, Belgium
Using EEG-NIRS wavelet coherence to assess neurovascular coupling in neonates with hypoxic ischaemic encephalopathy

P1.05. Marta Zanoletti, ICFO-The institute of photonic sciences, Spain
Non-invasive bedside assessment of microvascular and endothelial health in severe COVID-19 patients: the international HEMOCOVID-19 study

P1.06. Filippo Schiavo, Stockholm University and Karolinska Institutet, Sweden
Acute hypoxia determines the outcome of radiation therapy of hypoxic tumours
P1.07. Alexander Shestov, University of Pennsylvania, USA
Metabolic network analysis with 13C metabolomics on two TNBC xenograft models

P1.08. Dmitry Sergeev, Privolzhsky Research Medical University, Russia
Cerebral critical closing pressure at concomitant traumatic brain injury.

P1.09. Masamichi Moriya, Teikyo Heisei University, Japan
Changes in prefrontal cortical oxygenation and systemic circulation during mobilization in subarachnoid hemorrhage patients

P1.10. Akinori Ebihara, Tokai University Tokyo Hospital, Japan
Silent hypoxemia in covid-19 pneumonia

P1.11. Christel Cariddi, University of Bari, Italy
Evaluation of intraoperative end-tidal oxygen change relates to length of hospitalization in peridiaphragmatic surgery: a pilot study

P1.12. Christina Wolfsberger, Medical University of Graz, Austria
Impact of carbon dioxide on cerebral oxygenation and vital parameters in stable preterm and term neonates immediately after birth

Session: Clinical application 1 – Chair: Sebastiano Cicco

16.15 – 16.30 Edwin Nemoto, University of New Mexico, USA
Low Flow and Microvascular Shunts: A Final Common Pathway in Cerebrovascular Disease - a Working Hypothesis

16.30 – 16.45 Katsunori Oyama, Nihon University, Japan
Classification of Dementia Risk Using Time-resolved Near-infrared Spectroscopy and General Blood Test

16.45 – 17.00 Ateyeh Soroush, University of Calgary, Canada
NIRS studies show reduced interhemispheric functional connectivity in Multiple Sclerosis patients that exhibit cortical hypoxia

17.00 – 17.15 Damilola Adingupu, University of Calgary, Canada
Non-invasive detection of persistent cortical hypoxia in multiple sclerosis using frequency domain near-infrared spectroscopy (fdNIRS)

17.15 – 18.15 Virtual get together
Tuesday 27. July, 2021

13.00 – 14.00  Virtual get together

Session: Brain 2 . Chair: Kaoru Sakatani

14.00 – 14.15  Denis Bragin, Lovelace Biomedical Research Institute, USA
Involvement of endothelial nitric oxide synthase in cerebral microcirculation and oxygenation in traumatic brain injury

14.15 – 14.30  Maheen Siddiqui, Birkbeck College, UK
Imaging cerebral energy metabolism in healthy infants

14.30 – 14.45  Christina H, Wolfsberger, Medical University of Graz, Austria
Increased risk for cerebral hypoxia during immediate transition in stable term neonates of mothers who had smoked during pregnancy

14.45 – 15.00  Hamoon Zohdi, University of Bern, Switzerland
Cerebral oxygenation and systemic physiological changes during a verbal fluency task: Differences between men and women

15.00 – 16.00  Poster session 2

P2.01. Alexander Kalyanov, University of Zurich and University Hospital Zurich, Switzerland
Development and validation of liquid heterogeneous phantom for time domain near-infrared optical tomography (TD NIROT)

P2.02. Marta Lazzeroni, Stockholm University, Sweden
Hypoxic target volume determination in PET/CT imaging – the impact of deformable image registration method

P2.03. He Nucleus Xu, University of Pennsylvania, USA
Optical Redox Imaging as a Label-free Technique for Probing the Involvement of NAD(H) Redox Status in Some Major Biological Pathways in Breast Cancer

P2.04. Mandy Rauschner, University of Halle, Germany
Acidosis-induced regulation of Egr1 and Ccn1 in vitro and in experimental tumors in vivo

P2.05. Yu Okuma, Fukuyama City Hospital, Japan
Oxyhemoglobin level measured by near-infrared spectrometer is associated with brain mitochondrial dysfunction after cardiac arrest in rats

P2.06. Wataru Tsuchiya, Teikyo Heisei University Graduate School of Health Sciences, Japan
Usefulness of Brain Activity and Autonomic Activity in Motor Imagery Assessment -Focusing on the relationship with psychometric scales-
P2.07. Ksenia Trofimova, Privolzhsky Research Medical University, Russia

P2.08. Lorenzo Cortese, The Barcelona Institute of Science and Technology, Spain
Hybrid near infrared diffuse optical spectroscopic monitoring of cerebral hemodynamics and cytochrome c oxidase during acute ischemia in the rabbit fetus

P2.09. Sebastiano Cicco, University of Bari, Italy
Cardiovascular risk score did not correlate to gas exchange in COVID-19 patients

P2.10. Gerolamo Cicco, University of Modena and Reggio Emilia, Italy
Heme Oxigenasi 1/ High Mobility Group Box 1 pathway may have a possible role in Covid-19 ARDS (Acute respiratory distress syndrome) : a pilot histological study

P2.11. Peter Vaupel, University of Freiburg, Germany
Blood flow and respiratory gas exchange in the maternal-placental-fetal unit at term: A data update

P2.12. Frédéric Lange, UCL, United Kingdom
Upper trapezius muscle tonicity, assessed by palpation, relates to change in tissue oxygenation and structure as measured by Time-Domain Near Infrared Spectroscopy

Session: Methods 1 – Chair: Hamoon Zohdi

16.00 – 16.15 Sabino Guglielmini, University of Zurich, Switzerland
Machine learning enables to distinguish familiar and unfamiliar pairs of subjects performing a prolonged eye contact interaction task: A systemic physiology augmented functional near-infrared spectroscopy (SPA-fNIRS) hyperscanning study

16.15 – 16.30 Zuzana Kovacsova, UCL, UK
Absolute quantification of cerebral tissue oxygen saturation with multidistance broadband NIRS

16.30 – 16.45 Frédéric Lange, UCL, UK
Investigating changes in cerebral microvascular blood flow and mitochondrial metabolism together at the cot-side in neonatal encephalopathy

16.45 – 17.00 Ilias Tachtsidis, UCL, UK
Multivariate network analysis of cerebral and systemic variables for assessment of injury following hypoxic ischaemic encephalopathy

17.00 – 18.00 Virtual get together
Wednesday 28. July, 2021

13.00 – 14.00  Annual General Meeting

Session: Clinical application 2 – Chair: Oliver da Silva-Kress

14.00 – 14.15  **Paul Buehler, University of Maryland School of Medicine, USA**  
Modelling the effects of moderate hypoxia on the progression of pulmonary hypertension in sickle cell disease

14.15 – 14.30  **Sebastiano Cicco, University of Bari, Italy**  
Pulmonary Embolism in COVID-19 patients is not related to a worsening in tissue oxygenation

14.30 – 14.45  **Jonas Fischer, The Barcelona Institute of Science and Technology, Spain**  
Effect of non-medical face masks on cerebral blood oxygenation and blood flow

14.45 – 15.00  **Susanna Tagliabue, The Barcelona Institute of Science and Technology, Spain**  
Does hyperventilation therapy lead to periods of "misery perfusion" in neurocritical care patients? A pilot study by transcranial optical monitoring

15.00 – 16.00  **Poster session 3**

**P3.01. Weixiang Qin, Niigata University of Health and Welfare, Japan**  
The relationship between end-tidal carbon dioxide partial pressure changes and oxyhemoglobin concentration in prefrontal cortex changes during long-term exercise

**P3.02. Felix Scholkmann, University of Bern & University Hospital Zurich, Switzerland**  
Frontal cerebral oxygenation in humans at rest: A mirror symmetry in the correlation with cardiorespiratory activity

**P3.03. Andrey Oshorov, Burdenko Neurosurgery Institute, Moscow, Russia**  
Assessment of Cerebral Autoregulation and Optimal Mean Arterial Pressure with Near-Infrared Spectroscopy in Patients with Traumatic Brain Injury.

**P3.04. Oliver Thews, University of Halle, Germany, Germany**  
Evaluation of betulinic acid derivatives as PET tracers for hypoxia-induced carbonic anhydrase IX (CA IX) expression

**P3.05. Yu Okuma, Fukuyama City Hospital, Japan**  
A case of intracranial vertebral artery stenosis treated with percutaneous transluminal angioplasty and stenting under a brain oximeter
**P3.06. Gino Bopp, University Hospital Zurich, University of Zurich, Switzerland**
Cross-frequency coupling between brain and body signals: A systemic physiology augmented functional near-infrared spectroscopy (SPA-fNIRS) hyperscanning study

**P3.07. Asahi Tanaka, Teikyo University Hospital, Japan**
The relationship between advance notice of pain and prefrontal cortex

**P3.08. Alexey Trofimov, Privolzhsky Research Medical University, Russia**
Can eye tracking be used to predict the level of cerebral oxygen saturation in mild traumatic brain injury? A preliminary study.

**P3.09. Leif Bulow, Lund University, Sweden**
Interactions between hemoglobins and nucleic acids

**P3.10. Shinichiro Morishita, Fukushima Medical University, Japan**
Rating of Perceived Exertion Compared to Multiple Physiological Parameters and Leg Muscle Oxygenation during Supine Cardiopulmonary Exercise Testing in Healthy Adults

**P3.11. Aldo Di Costanzo Mata, UZH/USZ, Switzerland**
Phantoms with tunable chambers mimicking microvasculature and hemodynamic optical phenomena

**P3.12. Howard Halpern, University of Chicago, United States**
Directing local hypoxia radiation boosts in three tumor models with EPR pO2 imaging

**Session: Tumor oxygenation – Chair: Sally Pias**

16.00 – 16.15 **Peter Vaupel, University of Freiburg, Germany**
Blood supply and oxygenation status of the liver: From physiology to malignancy

16.15 – 16.30 **Pablo Fernández Esteberena, The Barcelona Institute of Science and Technology, Spain**
Potential of multi-modal clinical ultrasound and hybrid diffuse optics (LUCA platform) for malignant thyroid nodule detection

16.30 – 16.45 **Qi Wang, New Mexico Institute of Mining and Technology, USA**
Towards personalizing radiotherapy treatment: de novo lipid effects on intracellular oxygenation

16.45 – 17.00 **Ana Ureba, Karolinska Institutet, Sweden**
Photon and Proton Dose Painting based on Oxygen Distribution – Feasibility Study and TCP Assessment

17.00 – 18.00 Virtual get together
Thursday 29. July, 2021

13.00 – 14.00 Virtual get together

Session: Tissue oxygenation 1 – Chair: Michelle Puchowicz

14.00 – 14.15 Timothy Burton, Ryerson University, Canada
Feasibility of perfusion imaging for flap viability assessment

14.15 – 14.30 Tarcisi Cantieni, University of Bern, Switzerland
Feasibility to measure tissue oxygen saturation using textile-integrated polymer optical fibres

14.30 – 14.45 Sally Pias, New Mexico Institute of Mining and Technology, USA
Do vascular and extracellular measurements consistently reflect intracellular pO2?

14.45 – 15.00 Harold Swartz, Geisel College of Medicine at Dartmouth, USA
A radiation biological analysis of the possible mechanism for the oxygen effect in FLASH

15.00 – 16.00 Poster session 4

P4.01. Edwin Nemoto, University of New Mexico, USA
Cerebrovascular Reserve (CVR) and Stages of Hemodynamic Compromise

P4.02. Atsuhiro Tsubaki, Niigata University of Health and Welfare, Japan
Cerebral blood volume and cerebral oxygen exchange in the motor-related area during and after a 20-min moderate-intensity cycling exercise: A near-infrared spectroscopy vector analyses

P4.03. Masaru Kanda, Niigata University of Health and Welfare, Japan
Effects of neck and shoulder pain and the position of the head and neck on the intramuscular circulation of the cervical muscles

P4.04. Kaoru Sakatani, The University of Tokyo, Japan
Effects of exercise-diet therapy on cognitive function in healthy elderly people evaluated by deep learning based on basic blood test data

P4.05. Carmen Degitz, Halle, Halle (Saale), Germany
Role of acidosis induced signaling pathways on mitochondrial O2-consumption of tumor cells

P4.06. Felix Scholkmann, University Hospital Zurich, University of Zurich, Switzerland
Problems of oxygen transport to tissue in COVID-19 patients: The relevance of methemoglobin and carboxyhemoglobin

P4.07. Masamichi Moriya, Teikyo Heisei University, Japan
Long-term effects of physical exercise on physiological conditions evaluated by the Internet of medical things system
P4.08. Emanuele Russomanno, ETH Zurich and University Hospital Zurich, Switzerland
Effects of a range of head tissues optical properties on near-infrared spectroscopy

P4.09. Zuzana Kovacsova, University College London, UK
Investigation of confounding factors affecting the accuracy of the brain tissue oxygen saturation as derived by spatially resolved spectroscopy

P4.10. Eiji Takahashi, Saga University, Japan
Further evidence that gradients of extracellular pH direct migration of MDA-MB-231 cells in vitro.

P4.11. Giuseppe Cicco, DETO – Section of Internal Medicine, Endocrinology, andrology and Metabolic Diseases, Italy
Microcirculation and tissue oxygenation in diabetics wound healing - HIF influence

P4.12. Gennadi Saiko, Swift Medical Inc, Canada
An improved optical tissue model for tissue oximetry imaging applications

P4.13. Denis Bragin, Lovelace Biomedical Research Institute, United States
Effect of drag-reducing polymers on vascular hemodynamic and tissue oxygen supply in mouse model of diabetes mellitus

P4.14. Sang-Suk Lee, Sangji University, South Korea
T-cell activation inhibition for the effect of patch-type immunotherapy based on conjugation of anti-CD3 antibody and magnetic nanoparticles

Session: Methods 2 – Chair: Oliver Thews

16.00 – 16.15 Hiroshi Hirata, Hokkaido University, Japan
Simultaneous mapping of the partial pressure of oxygen, pH and inorganic phosphate using electron paramagnetic resonance: in vitro experiments

16.15 – 16.30 Inna Gertsenshtein, University of Chicago, USA
Validation and correction of [18]F-Misonidazole PET with pO2 EPR and DCE-MRI

16.30 – 16.45 Lin Z. Li, University of Pennsylvania, USA
Feasibility of noninvasive measurement of NAD(H) in tumor xenografts by in vivo phosphorus-31 magnetic resonance spectroscopic imaging

16.45 – 17.00 Eiji Takahashi, Saga University, Japan
On the mechanism of sustained mitochondrial membrane potential without functioning complex IV

17.00 – 18.00 Virtual get together
Friday 30. July, 2021

13.00 – 14.00  Virtual get together

14.00 – 14.15  Ursula Wolf, University of Bern, Switzerland
Manuscripts announcements: timelines, templates, review process

Session: Muscle – Chair: Chris Cooper

14.15 – 14.30  Andreas R. Thomsen, University of Freiburg, Germany
Improved oxygenation of human skin, subcutis and superficial cancers
upon mild hyperthermia delivered by wIRA-irradiation

14.30 – 14.45  Oliver da Silva-Kress, University of Bern, Switzerland
Numerical optimization of a NIRS device for monitoring tissue oxygen
saturation

14.45 – 15.00  Martin Wolf, University of Zurich, University Hospital Zurich,
Switzerland
Tissue oximetry with visible light

15.00 – 16.00  Poster session 5

P5.01. Keiichiro Kuronuma, Nihon University, Japan
Effect of atorvastatin on microcirculation evaluated by vascular occlusion test with near
infrared spectroscopy

P5.02. Ulf Jensen-Kondering, University Hospital Schleswig-Holstein, Germany
Electric properties tomography in a rodent model of ischemic stroke

P5.03. Meret Ackermann, University Hospital Zurich, Switzerland
Hybrid convolutional neural network (CNN) for image reconstruction in near-infrared
optical tomography

P5.04. Martin Wolff, University of Halle, Germany, Germany
Role of the mTOR signaling pathway during extracellular acidosis in tumor cells

P5.05. Shun Takagi, Doshisha University, Japan
Quadriceps muscle O2 dynamics in subjects without attenuation of deoxygenated
hemoglobin concentration at vastus lateralis muscle near the end of ramp cycling exercise

P5.06. Oxana Semyachkina-Glushkovskaya, Humboldt University, Germany
Photomodulation of lymphatic delivery of liposomes to the brain bypassing the blood-brain
barrier: the role of singlet oxygen

P5.07. Lei Ma, Nantong University, China
Physical stress Attenuates Working memory: An fNIRS Examination
P5.08. Leif Bulow, Lund University, Sweden
Thermodynamic characterization of the binding reaction between human ferric hemoglobins and haptoglobin

P5.09. O.A. Bragina, Lovelace Biomedical Research Institute, USA
Hemorheologic enhancement of cerebral perfusion by drag-reducing polymers for the treatment of the Alzheimer’s disease

P5.10. Ilias Tachtsidis, University College London, UK
Monitor cerebral oxygenation, haemodynamic and metabolism in children with epilepsy during a hyperventilation task.

P5.11. Nursyarizah Amirah Jasni, Shibaura Institute of Technology, Japan
Hemoglobin phase of oxygenation and deoxygenation in adults: an fNIRS study

P5.12. Arata Tsutsui, Tokyo Dental College, Japan
Effect of different clenching strength with oral appliance on oxygen dynamics of masseter muscle during exercise and recovery

Session: Tissue oxygenation 2 – Chair: Nucleus He Xu

16.00 – 16.15 Michael Komarovsky, Case Western Reserve University, USA
Postnatal exposure to brief hypoxia alters brain VEGF expression and capillary density in adult mice

16.15 – 16.30 Chris Cooper, University of Essex, UK
Characterization of a novel, genetically engineered, PEGylation site on a putative Hemoglobin Based Oxygen Carrier

16.30 – 16.45 An Ghysels, Ghent University, Belgium
Oxygen permeation pathways through phospholipid membranes in the liquid ordered and liquid disordered phases

16.45 – 17.00 Evgeniya Kirichenko, Southern Federal University, Russia
Immunofluorescence and ultrastructural identification of gap junctions in anaplastic astrocytoma

17.00 – 18.00 Award ceremony and virtual get together