

# 47<sup>th</sup> Annual meeting of the Fetal and Neonatal Physiological Society

## **FNPS XLVII**

october 4-7 2021  
**VIRTUAL**



# MEETING DIRECTORS

**Diego Gazzolo**

**Dept. of Medicine & Aging Sciences,  
University "G. D'Annunzio" Chieti - Italy**

**Alessandro Rolfo**

**Dept. of Surgical Sciences,  
University of Turin - Italy**

# ORGANIZING COMMITTEE

**Emanuela Marinoni**

**UOC Obstetrics & Gynaecology,  
San Filippo Neri Hospital, Rome - Italy**

**Anna Maria Nuzzo**

**Dept. of Surgical Sciences - University of Turin - Italy**

**Romolo Di Iorio**

**Dept. of Medical and Surgical Sciences and  
Translational Medicine  
Sapienza University of Rome - Italy**

# KEYNOTE SPEAKERS

Beth Allison  
Enrico Bertino  
Isabella Caniggia  
Vassilios Fanos  
Danilo Gavilanes  
Pierre Gressens  
Maurizio Mandalà  
Chiara Mandò  
Alberto Revelli  
Amanda Sferruzzi-Perri

Melbourne, Australia  
Turin, Italy  
Toronto, Canada  
Cagliari, Italy  
Maastricht, Netherlands  
Paris, France  
Cosenza, Italy  
Milan, Italy  
Turin, Italy  
Cambridge, UK

# FNPS MISSION STATEMENT

The FNPS stimulates discussion and exchange of ideas between physiologists, obstetricians and neonatologists. The FNPS considers an informal gathering and presentations of new and preliminary data, especially by investigators in training, essential to achieve goals.

The Society was founded in 1974 during an informal meeting in Oxford. Professor Geoffrey Dawes (1918-1996) and Dr. Gerhard (Bo) Gennser took the initiative and were made honorary members of the society in 1995.

The name of the annual conference (and society) has changed several times, reflecting the widening scope of the society:

1974-80 Conference on Fetal Breathing

1981-83 International Conference on Fetal Breathing and other Movements

1984-95 Society for the Study of Fetal Physiology

1996-date Fetal and Neonatal Physiological Society

Over the years the society has maintained its informal character and a lack of rigid structures. Those who have attended at least one of the previous three meetings are members of the society and will be informed about the next meeting. Abstracts for the Annual Meeting are requested two months before the meeting and are compiled in the Book of Abstracts to encourage recent and preliminary data to be presented.

The Organizational Coordinator will be selected by the Organizational Committee and shall serve the three years. The Organizational Committee shall consist of representatives from Africa, Asia, Australia, Canada, continental Europe, South America, the United Kingdom and the United States of America and shall be selected by the committee.

The Annual Meeting will be held in Europe, North America and the Southern Hemisphere, in June-September, as determined by the Organizational Committee. Approximately half of the meetings will be held in Europe.

Any residual funds from the prior meeting shall be passed on to the coordinator for the next meeting. Audit will not be required if the residual funds are less than 10,000 US\$. The (local) Organizing Committee shall have the right to solicit funds in the name of the Society from organizations for the purpose of providing financial support for students and fellow-in-training to attend the meeting of the society.

# MONDAY, OCTOBER 4<sup>th</sup>, 2021

9.00 a.m. **Opening**

9.30 a.m. **ORAL SESSION I**

## **CLINICAL AND APPLIED NEONATOLOGY**

**Keynote Lecture 1: Enrico Bertino (Turin, ITALY)**

**Nature or nurture: where inequality begins?**

**Chairs**

**Dino Giussani (Cambridge, UK), Chiara Peila (Turin, ITALY)**

10.00 a.m. **ORAL PRESENTATION I**

**1. Shiraz Badurdeen**, Monsurul Hoq, Diana Zannino, Georgia A Santomartino, Alissa Heng, Anthony Woodward, Stefan C. Kane, Calum Roberts, C Omar F Kamlin, Graeme R Polglase, Stuart B Hooper, Susan Donath, Peter G Davis, Douglas A Blank. *(The Ritchie Centre, Hudson Institute of Medical Research, 27-31 Wright St, Clayton, Victoria, Australia).*

**Physiologically-based cord clamping for infants  $\geq 32+0$  weeks gestation - a randomised clinical trial and reference percentiles for heart rate and oxygen saturation.**

**2. Iliana Bersani**, Marika Perrotta, Patrizia Brindisino, Mariangela Ferrari, Diego Gazzolo. *(Department of Medical and Surgical Neonatology, Bambino Gesù Children's Hospital, Rome, Italy).*

**Early Predictors of Abnormal Magnetic Resonance Imaging Patterns in Asphyxiated Infants: S100B Protein Urine Levels.**

**3. Emily S. Nichols**, Emily G. Huang, Jianan Wang, Megan E. Mueller, Estee Goldberg, Barbra de Vrijer, Roy Eagleson, Charles A. McKenzie, Sandrine de Ribaupierre, Emma G. Duerden. *(Applied Psychology, Faculty of Education, Brain and Mind Institute, Clinical Neurological Sciences, Medical Sciences, Obstetrics & Gynaecology, Biomedical Engineering, Medical Biophysics, Anatomy and Cell Biology Western University, Canada).*

**Hippocampal development from the third trimester to age three.**

**4. Naoshi Yamada**, Shinji Katsuragi, Tomoko Goto, Junsuke Muraoka, Yoshinori Aoki, Rie Yamashita, Kazuhiko Nakame, Yuki Kodama, Masatoki Kaneko, Hiroshi Sameshima, And Tsuyomu Ikenoue. *(Department Of Obstetrics And Gynecology In Miyazaki University).*

**Relationship between extremely low birth weight infants at 22-27 gestational weeks and risk of intraventricular hemorrhage.**

**5. Alicia K Yee**, Leon S Siriwardhana, Gillian M Nixon, Flora Y Wong, Rosemary SC Horne. *(Department of Paediatrics and The Ritchie Centre, Monash University Melbourne, Australia).*

**Effect of sleep state on periodic breathing and physiological consequences in preterm infants.**

**6. Consuelo Lomas-Soria**, Peter W Nathanielsz, Elena Zambrano. *(Instituto Nacional de Ciencias Médicas y Nutrición SZ, Mexico, Mexico).*

**Maternal Dietary Intervention (DINT) in Pregnant Obese (MO) Rats Prevents Liver Fat Accumulation and Adverse Metabolic Outcomes in Male Offspring (F1).**

11.30 a.m. **Break**

1.00 p.m. **ORAL SESSION II**

**DEVELOPMENTAL NEUROSCIENCE**

**Keynote Lecture 2: Danilo Gavilanes (Maastricht, Netherlands)**  
**Clinical Implications of Epigenetic Dysregulation in Perinatal Hypoxic-Ischemic Brain Damage**

**Chairs**

**Luc Zimmerman (Maastricht, NL), Giuseppe Lapergola (Chieti, ITALY)**

1.30 p.m. **ORAL PRESENTATION II**

**1. Sharmony B. Kelly**, Vanesa Stojanovska, Valerie Zahra, Alison Moxham, Suzanne Miller, Timothy JM Moss, Stuart B Hooper, Marcel F. Nold, Claudia A. Nold-Petry, Justin M. Dean, Laura Bennet, Alistair J. Gunn, Graeme R. Polglase, Robert Galinsky. (*The Ritchie Centre, Hudson Institute of Medical Research*).  
**IL-1RA Reduces Neuroinflammation and Improves Oligodendrocyte Survival in Near-Term Fetal Sheep.**

**2. Alice McDouall**, Sumudu Ranasinghe, Guido Wassink, Justin Dean, Joanne Davidson. (*Department of Physiology, Faculty of Medical and Health Sciences, University of Auckland, New Zealand*)  
**Neuroprotective effect of connexin hemichannel blockade with tonabersat after hypoxia ischemia in the neonatal rat pup.**

**3. Ashley K. Boyle**, N. Suff, S. N. Waddington, D. Peebles. (*Department of Maternal and Fetal Medicine, Institute for Women's Health, University College London, London, United Kingdom*).  
**Cervical Gene Delivery of the Antimicrobial Peptide Human  $\beta$  Defensin 3 (HBD3) Reduces Perinatal Neuroinflammation in a Mouse Model of Ascending Infection-Associated Preterm Birth.**

**4. Gabrielle K. Crombie, Hannah K Palliser, Julia C. Shaw, Deborah M. Hodgson, David W Walker, Jonathan J. Hirst.** (*University of Newcastle, Newcastle, NSW, Australia*).  
**Emapunil treatment protects against prenatal stress-induced inhibition of myelin basic maturation and associated neurobehavioural deficits.**

**5. Ingrid Dudink**, Petra S Hüppi, Stéphane V Sizonenko, Yen Pham, Margie Castillo-Melendez, Amy E Sutherland, Beth J Allison, Suzanne L Miller (*The Ritchie Centre, Hudson Institute of Medical Research, Clayton Australia*).  
**Altered neuronal growth trajectory in fetal growth restriction.**

**6. Simerdeep K. Dhillon**, Eleanor R. Gunn, Christopher A. Lear, Guido Wassink, Joanne O. Davidson, Alistair J. Gunn, Laura Bennet. (*Department of Physiology, Faculty of Medical and Health Sciences, University of Auckland, New Zealand*).  
**The role of sympathetic nervous system in regulating post-asphyxial cerebral hypoperfusion and suppression of neural activity.**

3.00 p.m    **Break**

4.30 pm.    **ORAL SESSION III**  
**NUTRITION & DEVELOPMENT**

**Keynote Lecture 3: Chiara Mandò (Milan, Italy)**  
**Nutrition during the first 1000 days of life and  
the programming of adults' health**

**Chairs**

**Timothy Regnault (London, CANADA), Leonardo Ermini (Siena, ITALY)**

5.00 p.m.    **ORAL PRESENTATION III**

**1. Chiara Peila (Turin, Italy)**

**Factors influencing Human Milk Biomarkers: from gestational diabetes mellitus to preeclampsia.**

**2. Francesco Cresi - Martina Capitanio (Turin, Italy).**

**Standard bags for parenteral nutrition in premature VLBW, an extra arrow in the neonatologist's bow?**

**3. Alessandra Coscia (Turin, Italy).**

**The evaluation of feeding intolerance in preterm infants: the application of a standard protocol.**

**4. Elena Maggiore (Turin, Italy).**

**Study protocol for a randomized control trial on a valved feeding system with ergonomic teat. Effects on the coordination of the sucking, swallowing and breathing process in late-preterm infants.**

**5. Alice Grometto (Chieti, Italy).**

**Near-infrared spectroscopy monitoring and the effects of feeding regimens on the cerebral and splanchnic regions**

**6. Valentina Bozzetti (Chieti, Italy).**

**Impact of Continuous vs Bolus Feeding on Splanchnic Perfusion in Very Low Birth Weight Infants: A Randomized Trial**

6.30 p.m.    **closing of the day**

# TUESDAY, OCTOBER 5<sup>th</sup>, 2021

9.00 a.m.

## **ORAL SESSION IV** **CLINICAL OBSTETRICS**

**Keynote Lecture 4: Alberto Revelli (Turin, Italy)**  
**Epigenetic regulation of human embryo development during in vitro culture**

**Chairs**

**Jan Derks (Utrecht, NL), Laura Moretti (Turin, ITALY)**

9.30 a.m.

## **ORAL PRESENTATION IV**

**1. Devanshi Jani, Alys R. Clark, Andrew Melbourne, Anna L David, S. Ali Mirjalili, Peter Stone.** (*Department of Obstetrics and Gynaecology, University of Auckland*).

**Effect of maternal position on placental function in fetal growth restriction: An MRI study.**

**2. Giorgia Gasparroni, Caterina Di Battista, Adele Patrizia Primavera, Mariangela Conte, Rita Salomone, Diego Gazzolo.** (*Neonatal Intensive Care Unit, G. d'Annunzio University, Chieti, Italy*).

**S100B protein, cerebral ultrasound and magnetic resonance imaging patterns in brain injured preterm infants.**

**3. Anais Serati, Gaia Maria Anelli, Chiara Novielli, Fabrizia Lisso, Alessandra Nava, Irene Cetin, Renata Paleari, Chiara Mandò.** (*"Luigi Sacco" Dept of Biomedical and Clinical Sciences, Università degli Studi di Milano, Milano, Italy*).

**MicroRNA profiling in maternal plasma of obese pregnant women affected by gestational diabetes mellitus.**

**4. Lotte Meijerink** with Dr. A. T. Lely. (*UMC Utrecht*).

**"Kidney-sparing" in brain-sparing fetal growth restricted fetuses.**

**5. Marlisa Gatto, Anna Maria Nuzzo, Stefano Cosma, Laura Moretti, Juan Carlos Cutrin, Chiara Benedetto, Alessandro Rolfo.** (*Department of Surgical Sciences, Gynecology and Obstetrics, Center of Imaging Molecular, University of Turin*).

**Placental Anti-oxidant Adaptive Response in Asymptomatic and Symptomatic COVID-19 Third Trimester Pregnancies.**

**6. Brahmdeep S. Saini, Robin Ducas, Jack R.T. Darby, Davide Marini, Liqun Sun, Christopher K. Macgowan, Rory Windrim, John C. Kingdom, Rachel M. Wald, Janna L. Morrison, Mike Seed.** (*Institute of Medical Science, University of Toronto & Heart Centre, SickKids Hospital; Toronto, CAN*).

**Fetal oxygen consumption and ovarian vein hemodynamics in supine maternal positioning in healthy late gestation pregnancy.**

11.00 a.m. **Break**



12.30 a.m. **ORAL SESSION V**

**EXPERIMENTAL NEONATOLOGY**

**Keynote Lecture 5: Pierre Gressens (Paris, France)**  
**Role of Inflammation in Perinatal Brain Damage**

**Chairs**

Donald Peebles (London, UK), Jorge Lopez-Tello (Cambridge, UK)

1.00 p.m. **ORAL PRESENTATION V**

**1. Felipe A Beñaldo**, Jiménez TA, Silva PA, Paz AA, González-Candia AA, Herrera EA. (*Laboratorio de Función y Reactividad Vasculár (LFRV), Pathophysiology Program, Institute of Biomedical Sciences (ICBM), Faculty of Medicine, University of Chile*).

**Fetal echocardiographic parameters in male guinea pigs under hypobaric gestation.**

**2. Badurdeen S, Galinsky R, Roberts C, Crossley K, Zahra V, Rodgers, Moxham A1, Davis P, Hooper S, Polglase G, Emily Camm** (*The Ritchie Centre, Hudson Institute of Medical Research, Clayton VIC 3168, Australia*).

**The Effect of Rapidly Weaning Supplemental Oxygen following Return of Spontaneous Circulation (ROSC) on Cerebral Oxygenation and Mitochondrial Function in Near-term Asphyxiated Lambs.**

**3. Guido Wassink, Alice J McDouall, K Te Whenua, S Harrison, MR Battin, Kelly Q Zhou, Laura Bennet, Alistair J Gunn, Joanne O Davidson** (*Department of Physiology, Faculty of Medical and Health Sciences, University of Auckland, New Zealand*).

**Neuroprotection with delayed hypothermia for 24 hours after mild hypoxia-ischemia in near-term fetal sheep.**

**4. Indya M Davies**, Erin V McGillick, Karyn Rogers, Kelly J Crossley, Alison Moxham, Valerie Zahra, Emily Pryor, Stuart B Hooper. (*The Ritchie, Hudson Institute of Medical Research; Department of Obstetrics, Monash University*).

**Effects of elevated airway liquid at birth in spontaneously breathing near-term newborn lambs.**

**5. Ashley S Meakin**, Jack RT Darby, Stacey L Holman, Michael D Wiese & Janna L Morrison. (*Univeristy of South Australia: Clinical and Health Science, Adelaide*).

**Maternal late gestation undernutrition does not affect fetal liver or placental cytochrome P450 activity.**

**6. Beth Piscopo**, Amy Sutherland, Beth Allison, Suzanne Miller. (*The Ritchie Centre, Hudson Institute of Medical Research, Clayton 3168, Australia*).

**Assessing cerebrovascular integrity and function in the middle cerebral arteries of growth restricted neonates after perinatal interventions.**

2.30 p.m. **Break**

4.00 p.m. **POSTER SESSION I**

**1. Felipe A Beñaldo**, TA Jiménez, PA Silva, AA Paz, AA González-Candia, EA Herrera (*Laboratorio de Función y Reactividad Vascular (LFRV), Pathophysiology Program, Institute of Biomedical Sciences (ICBM), Faculty of Medicine, University of Chile*).

**Hypobaric gestation alters postnatal carotid and femoral Doppler variables in male guinea pigs.**

**2. Alejandro A Candia**, Alejandro González-Candia, Pamela V. Arias, Emilio A. Herrera. (*Vascular Function & Reactivity Lab, Pathophysiology Program, ICBM, Faculty of Medicine, Universidad de Chile*).

**Postnatal hemin administration prevents vascular dysfunction and oxidative stress after chronic hypoxic gestation.**

**3. Ilaria Faletti**, Anna Maria Nuzzo, Laura Moretti, Cristian Macchione, Marco Alberti, Benedetta Montersino, Guido Menato, Alessandro Rolfo. (*Department of Surgical Sciences, Gynecology and Obstetrics, University of Turin, Turin – Italy*).

**Effect of endocrine disrupting chemical Bisphenol A (BPA) on glucose transporters (GLUTs) expression in Placenta-derived Mesenchymal Stromal Cells.**

**4. Smith EVL, Dyson RM, Regnault TRH, Sarr O., Vandeboor C, Berry MJ, Peng L, Clint Gray.** (*Department of Paediatrics and Child Health, University of Otago, Wellington, New Zealand*).

**Excess maternal fructose intake programmes adult offspring hepatic mitochondrial function and lipid metabolism.**

**5. Arya Jithoo**, Maddy Smith, Tayla Penny, Megan Finch-Edmondson, Michael Fahey, Suzanne Miller, Courtney McDonald. (*The Ritchie Centre, Hudson Institute of Medical Research, Clayton, Australia*).

**Using MRI-guided-focused-ultrasound (MRIGFUS) as a novel non-invasive method for neural stem cell delivery to the neonatal brain.**

**6. Mitchell C Lock**, KJ Botting, Y Niu, SG Ford, S Orgeig, DA Giussani, JL Morrison. (*UniSA: Clinical and Health Science, University of South Australia*).

**Dexamethasone reduces 11 $\beta$ -Hydroxysteroid dehydrogenase 1 expression the fetal lung following hypoxic pregnancy.**

**7. Camilla Manzan Martins**, Roberta Romagnoli, Laura Cresti, Leonardo Ermini, Francesca Ietta, Luana Paulesu. (*Università degli Studi di Siena*).

**Effect of para-Nonylphenol on expansion of Extravillous Trophoblast (EVT) Spheroids on Human Endometrial Stromal (HESCs) cells.**

**8. Elena Zambrano, Peter W Nathanielsz.** (*Instituto Nacional de Ciencias Médicas y Nutrición SZ, Mexico, Mexico; University of Wyoming, Laramie, WY, United States*).

**Programming-aging interactions: a discourse.**

**9. Kimberley J Botting**, W Tong, Y Niu, TA Garrud, BJ Allison, L Zhang, SG Ford, Q Lyu, OV Patey & DA Giussani. (*Department of Physiology Development & Neuroscience, University of Cambridge, UK*).

**Isolating Mechanisms on Future Cardio-Renal Risk in Mothers with Complicated Pregnancy.**

**10. Clint Gray, Erin Vanessa LaRae Smith, Shuang Zhao, Adriana Zardini Buzatto, Janet Li, Ryan Duruisseau-Kuntz, Liang Li, Timothy RH Regnault.** (*Departments of Obstetrics and Gynaecology and Physiology and Pharmacology Schulich School of Medicine & Dentistry, Western University London, Ontario Canada*).

**Alterations in offspring guinea pig liver metabolome and lipidome following maternal fructose consumption prior to and during pregnancy.**

**11. Alexander Riquelme,** Claudio Araya, Felipe Beñaldo, María E Salinas, Francisca Rodrigo, Martín A. Vergara, Catalina Muñoz, Jorge Toledo, Guillermo J Valenzuela, Aníbal J Llanos, María Serón Ferré. (*Programa de Fisiopatología, Facultad de Medicina, Universidad de Chile*).

**Melatonin administration modifies pulmonary trunk and small lung arteries in newborn lambs.**

**12. Charmaine Rock.** (*The Ritchie Centre, Hudson Institute of Medical Research & Monash University*).

**Cardiovascular decline over the neonatal period in an ovine model of fetal growth restriction.**

**13. Tegan White,** Beth Allison, Amy Sutherland, Charmaine Rock, Yen Pham, Emily Camm, Suzanne Miller. (*The Ritchie Centre, Hudson Institute of Medical Research, Clayton, Australia*).

**Characterising cerebellar morphology and behaviour in a lamb model of fetal growth restriction.**

**14. Sarah J. Hammond,** Andrea J Roff, Joshua L Robinson, Jack RT Darby, Michael J Stark, Tim J M. Moss, Ashley Meakin, Andrew Davies, Beverly S Muhlhausler, Robert J Bischof, Vicki L Clifton, Megan J Wallace, Andrew Tai, Janna L Morrison, Kathryn L Gatford. (*Robinson Research Institute, Adelaide Medical School, University of Adelaide, Australia*).

**Does in utero exposure to maternal asthma impact fetal airway development?**

**15. Luís F. Grilo,** João D. Martins, Mariana S. Diniz, Chiara H. Cavallaro, Carolina Tocantins, Inês Baldeiras, Teresa Cunha-Oliveira, Stephen Ford, Peter W. Nathanielsz, Paulo J. Oliveira, Susana P. Pereira. (*University of Coimbra, CNC - Center for Neuroscience and Cell Biology, CIBB - Centre for Innovative Biomedicine and Biotechnology, UC-Biotech, Biocant Park, Cantanhede, Portugal*).

**Maternal obesity during gestation impairs maternal hepatic mitochondrial function and redox state in a lobe-dependent manner.**

**16. Gabriella Levantini,** Alessandro Graziosi, Sara De Sanctis, Diego Gazzolo. (*Neonatal Intensive Care Unit, G. d'Annunzio University, Chieti, Italy*).

**Antenatal predictors of adverse neurological follow up in high-risk pregnancies.**

**17. Kelly Q Zhou,** Laura Bennet, Alistair J Gunn, Joanne O Davidson (*Department of Physiology, University of Auckland, Auckland, NZ*).

**Prolonged loss of EEG power after hypothermia is associated with persisting neuroinflammation.**

**18. Marie Higashi,** Taketsugu Kawano, Nozomi Nakamura, Yoko Nakajima, Kayo Tomimori, Nozomi Yoshimoto, Satoshi Matsuzawa, Naoshi Yamada, Kenjiro Ishiyama, Nozomi Watanabe, Shinji Katsuragi. (*Department of Obstetrics and Gynecology, Faculty of Medicine, University of Miyazaki, Japan*).

**Phasic changes in the maternal venous return during elective cesarean delivery: A pilot study using real-time transthoracic 3D echocardiography.**

**19. Masahiro Nakao,** Yukiko Nanba, Asumi Okumura, Junichi Hasegawa, Satoshi Toyokawa, Kiyotake Ichizuka, Naohiro Kakayama, Shoji Satoh, Nanako Tamiya, Akihito Nakai, Keiya Fujimori, Tsugio Maeda, Hideaki Suzuki, Mitsutoshi Iwashita, Akira Oka, Tomoaki Ikeda. (*The Recurrence Prevention Committee, The Japan Obstetric Compensation System for Cerebral Palsy, Japan Council for Quality Health Care, Tokyo, Japan*).

**Correlation between FHR evolution patterns and MRI findings in severe cerebral palsy: a longitudinal study.**

6.30 p.m. **closing of the day**

# WEDNESDAY, OCTOBER 6<sup>th</sup>, 2021

9.00 a.m. **POSTER SESSION II**

**1. Laura Moretti**, Anna Maria Nuzzo, Stefano Canosa, Marta Sestero, Bernadette Evangelisti, Marco Alberti, Nicole Brunod, Alberto Revelli, Alessandro Rolfo. (*Department of Surgical Sciences, Obstetrics and Gynecology, Physiopathology of Reproduction and IVF Unit, University of Turin, Turin -Italy*).

**Placental Glucose Transporters expression in homologous and oocyte donation pregnancies.**

**2. Shizuka Obata**, Shinji Katsuragi, Satoshi Matsuzawa, Junsuke Muraoka, Naoshi Yamada, Yoshinori Aoki, Yuki Kodama. (*University of Miyazaki Obstetric and Gynecology*).

**Fetal brain hemorrhage due to maternal vitamin K deficiency.**

**3. Madeleine J Smith**, Megan Finch-Edmondson, Suzanne L Miller, Annabel Webb, Michael C Fahey, Graham Jenkin, Madison Claire Badavy Paton, Courtney A McDonald. (*The Ritchie Centre, Hudson Institute of Medical Research, Clayton, Victoria, Australia. Department*).

**High acceptability of neural stem cell therapy in the Australian cerebral palsy community.**

**4. Anna Maria Nuzzo**, Eugenio Gullo, Laura Moretti, Celeste Di Gregorio, Fiammetta Gervasoni, Chiara Benedetto, Luca Marozio, Alessandro Rolfo. (*Department of Surgical Sciences, Gynecology and Obstetrics, University of Turin, Turin - Italy*).

**Role of the Immune Checkpoints in Recurrent Pregnancy Loss (RPL): New Insights on a Detrimental and Elusive Disorder.**

**5. Valentina Botondi**, Marika Perrotta, Laura Di Ricco, Cynzia Spagnuolo, Diego Gazzolo. (*Neonatal Intensive Care Unit, G. d'Annunzio University, Chieti, Italy*).

**Perinatal Asphyxia Partly Affects Presepsin Urine Levels in Non-Infected Term Infant.**

**6. Giuseppe Lapergola**, Roberta Patacchiola, Elisabetta Barbante, Sara Torresi. (*Neonatal Intensive Care Unit, G. d'Annunzio University, Chieti, Italy*).

**Activin A, cerebral ultrasound and magnetic resonance imaging patterns in brain injured preterm infants.**

**7. Madeleine Smith**, Amy SutherlandI, Yen Pham, Tayla Penny, Graham Jenkin, Suzie Miller, Michael Fahey and **Courtney McDonald**. (*The Ritchie Centre, Hudson Institute of Medical Research, Clayton, Victoria, Australia*).

**Understanding the effect of immunosuppression on neonatal brain injury.**

**8. Guido Wassink**, Ted Andelius, Abbey Lissaman, Paul Drury, Laura Bennet, Alistair Gunn. (*Department of Physiology, University of Auckland, Auckland, New Zealand*).

**Epileptiform EEG transients predict hippocampal, but not striatal, neuronal loss after hypoxia-ischemia in near-term fetal sheep.**

**9. Laura Abella**, Ebe D'Adamo, Mariachiara Strozzi, Claudia D'Egidio, Diego Gazzolo. (*Hospital Universitari Dexeus, Barcelona, Spain*).

**S100B Maternal Blood Levels in Gestational Diabetes Mellitus are Growth, Gender and Delivery Mode Dependent.**

**10. Carla Avena Zampieri**, Jana Hutter, Alena Uus, Anna Milan, Mary Rutherford, Anne Greenough, Lisa Story. (*St Thomas Hospital (NHS), King's College London*).

**Advanced MRI techniques to assess normal and pathological lung development: a pilot study.**

**11. Kerri Smith.** (*University of Manchester*).

**Chronic prenatal hypoxia alters mitochondrial function in the fetal rat heart.**

**12. Nhi T Tran**, Sharmony B Kelly, Rod Snow, David W Walker, Stacey J Ellery, Robert Galinsky. (*Faculty of Health Science, RMIT University, Bundoora, Melbourne, Victoria, Australia*).

**Investigating the effects of creatine on post-asphyxial seizures in near term fetal sheep.**

**13. Catherine G Dimasi**, Joanna Lazniewska, Sally E Plush, Brahmdeep S Saini, Stacey L Holman, Steven KS Cho, Michael D Wiese, Alexandra Sorvina, Christopher Macgowan, Mike Seed, Doug A Brooks, Janna L Morrison, Jack RT Darby. (*Early Origins of Adult Health Research Group, Health and Biomedical Innovation, UniSA: Clinical and Health Sciences, University of South Australia, Adelaide, South Australia, Australia*).

**Redox ratio in the left ventricle of the growth restricted fetus is linked to cardiac output.**

**14. Christopher A Lear**, Benjamin A Lear, Joanne O Davidson, Simerdeep K Dhillon, Alistair J Gunn, Laura Bennet. (*Department of Physiology, The University of Auckland*).

**Delayed tumor necrosis factor blockade after hypoxia-ischemia in fetal sheep ameliorates tertiary white matter injury.**

**15. Tessa AC Garrud**, N Teulings, FG Conlon, W Tong, SG Ford, Y Niu, LM Nicholas†, JB Derks, SE Ozanne, DA Giussani. (*University of Cambridge, Cambridge, United Kingdom*).

**Comparative Adverse Effects of Antenatal Glucocorticoid Formulations: Studies in the Chicken Embryo.**

**16. Rachael C Crew**, Kimberley CW Wang, Peter B Noble, Peter J Mark, Caitlin S Wyrwol, Dino A Giussani. (*School of Human Sciences, The University of Western Australia, Australia*).

**Chronobiological effects of gestational hypoxia on the placental-cardiac molecular clock.**

**17. Youguo Niu**, Q Lyu, RM Hess, SG Ford, TA Garrud, A Iqbal, JO Louca, W Tong, KJ Botting, DA Giussani. (*Department of Physiology Development & Neuroscience, University of Cambridge, UK*).

**Novel Gasotransmitter Cardio-Protection in the Developing Heart: Comparative Roles of Hydrogen Sulphide and Carbon Monoxide.**

**18. Alejandro A. Candia**, Samantha C Lean, Edina Gulacsi, Emilio A. Herrera, Bernardo J. Krause, Amanda N. Sferruzzi-Perri. (*Centre for Trophoblast Research, Department of Physiology, Development and Neuroscience, Physiology*).

**High fat high sugar diet in mice alters fetal blood glucose and inflammatory markers in association with changes in placental labyrinth zone gene expression.**

**19. Benjamin Lear**, Christopher Lear, Joanne Davidson, Alistair Gunn, Laura Bennet. (*Fetal Physiology and Neuroscience Group, Department of Physiology, University of Auckland, Auckland, NZ*).

**The long-term neuronal and EEG outcomes after hypoxia-ischaemia in preterm fetal sheep.**

**20. Yamaoka S**, Crossley KJ, McDougall ARA, Rodgers K, Zahra VA, Moxham A, te Pas AB, **Erin McGillick**, Hooper SB. (*The Ritchie Centre, Hudson Institute of Medical Research, Melbourne, Victoria, Australia*).

**Increased airway liquid volumes at birth impairs cardiorespiratory function in preterm and near-term lambs.**

**21. Marina Nechaeva**, Dobretsov Maxim. (*Institute of Developmental Biology RAS Moscow, Russia; Institute of Evolutionary Physiology and Bioc*).

**Distinct periods in the dynamics of chicken embryo heart response to acute hypoxia.**

11.30 a.m. **Break**

1.00 p.m.

### **ORAL SESSION VI**

#### **CLINICAL THERAPIES AND DEVELOPMENTAL PROGRAMMING**

**Keynote Lecture 6: Amanda Sferruzzi-Perri (Cambridge, UK)**

**The role of the placenta in controlling materno-fetal nutrient allocation during pregnancy and its importance for offspring metabolic health.**

**Chairs**

Emilio Herrera (Santiago, CHILE), Kimberley Botting (Cambridge, UK)

1.30 p.m.

### **ORAL PRESENTATION VI**

**1. Anna L K Cochrane**, Youguo Niu, Sage G Ford, Dino A Giussani. (*University of Cambridge, Cambridge, United Kingdom*).

**Modelling Obstructive Sleep Apnoea in Pregnancy: Direct Effects of Intermittent Hypoxia on Embryonic Cardiac Function and Growth.**

**2. Leonardo Ermini**, Mandalà M, Cresti L, Romagnoli R, Patrussi L, Paulesu L, Francesca Ietta. (*Department of Life Sciences, University of Siena, Siena, Italy; Department of Biology, Ecology & Earth Sciences, University of Calabria, 87036 Rende, Italy*).

**Placenta-fetal heart axis: effect of BPA dietary exposure during pregnancy.**

**3. Elena Zambrano**, Hillary F Hube, Luis A Reyes Castro, Kenneth Gerow Guadalupe L Rodríguez-González, Roberto Chavira, **Peter W Nathanielsz**. (*Instituto Nacional de Ciencias Médicas y Nutrición SZ, Mexico, Mexico; University of Wyoming, Laramie, WY, United States*).

**Developmental programming-aging interactions have sex-specific effects on life-course circulating adrenal steroids in rats exposed to a maternal protein restricted diet.**

**4. Jorge Lopez-Tello**, Zoe Schofield, Raymond Kiu, Amanda N Sferruzzi-Perri, Lindsay Hall. (*Centre for Trophoblast Research, University of Cam*).

**Mind the Gut: Maternal Gut Bacteria Controls Feto-Placental Growth.**

**5. Ousseynou Sarr**, Kristyn Dunlop, Nicole Stachura, Lin Zhao, Karen Nygard, Jennifer A. Thompson, Joshua Findlay, Jennifer Hadway, Bryan S. Richardson, Yves Bureau, Nica Borradaile, Ting-Yim Lee, and Timothy R.H. Regnault. (*Western University, 1151 Richmond Street, London, Ontario, N6A 5C1, Canada*).

**Differential and synergistic effects of low birth weight and Western diet on skeletal muscle vasculature, mitochondrial lipid metabolism and insulin signaling in guinea pigs.**

**6. Joshua L Robinson**, Andrea J Roff, Sarah J Hammond, Jack RT Darby, Andrew Tai, Tim JM. Moss, Ashley Meakin, Andrew Davies, Beverly S Muhlhausler, Robert J Bischof, Vicki L Clifton, Megan J Wallace, Michael J Stark, Janna L Morrison, Kathryn L Gatford. (*Robinson Research Institute, University of Adelaide*).

**Efficacy of betamethasone to prevent poor pulmonary outcomes at birth in an experimental model of maternal asthma.**

3.00 p.m. **Break**

4.00 p.m. **ORAL SESSION VII**  
**EXPERIMENTAL OBSTETRICS**

**Keynote Lecture 7: Isabella Caniggia (Toronto, Canada)**  
**Preeclampsia and the Oxygen Response: Mechanisms, Consequences, and Targeting Strategies**

**Chairs**

Francesca Ietta (Siena, ITALY), Alessandro Rolfo (Turin, ITALY)

5.00 p.m. **ORAL PRESENTATION VII**

**1. Victor Ayulo**, Desmond Moronge, Riyaz Mohamed, Ellen Gillis, Jennifer Sullivan, Jessica L Faulkner. (*Department of Physiology, Medical College of Georgia, Augusta University, Augusta, GA*).

**Acute kidney injury prior to pregnancy decreases late-gestation urine volume and increases plasma aldosterone levels.**

**2. Jack R. T. Darby**, Georgia K. Williams, Steven K.S. Cho, Brahmdeep S. Saini, Ashley S. Meakin, Stacey L. Holman, Megan Quinn, Michael D. Wiese, Christopher K. Macgowan, Mike Seed, Janna L. Morrison. (*UniSA: Clinical and Health Science, University of South Australia*).

**MRI characterisation of blood flow and oxygen delivery in the fetal sheep during Sildenafil Citrate exposure.**



**3. Britt Delnoy**, Minela Haskovic, Jo Vanoevelen, Laura K. M. Steinbusch, E. Naomi Vos, Kèvin Knoops, Luc JI Zimmermann, Paolo G.V. Martini, Ana I Coelho, M. Estela Rubio-Gozalbo. (*Pediatrics, Maastricht UMC+, Maastricht, The Netherlands*).

**The promise of mRNA treatment: the example of classic galactosemia.**

**4. Jose Leon**; Jesenia Acurio; Lina Bergman; Juan Lopez, Anna Karin Wikström; Pablo Torres-Vergara; Felipe Troncoso; Fidel Ovidio Castro; Manu Vati-sh; **Carlos Escudero**. (*Vascular Physiology Laboratory, Department of Basic Sciences, Universidad del Bío-Bío, Chillán, Chile*).

**Disruption of the Blood-Brain-Barrier by extracellular vesicles from pre-eclampsia plasma and hypoxic placentae: attenuation by magnesium sulfate.**

**5. Andrea J. Roff**, Joshua L. Robinson, Sarah J. Hammond, Andrew Davies, Vicki L. Clifton, Megan J. Wallace, Tim J. M. Moss, Jack R. T. Darby, Andrew Tai, Michael J. Stark, Beverly S. Muhlhausler, Robert J. Bischof, Janna L. Morrison and Kathryn L. Gatford. (*Robinson Research Institute, Adelaide Medical School*).

**Asthma Progression During Pregnancy.**

**6. Silva PA**, Beñaldo FA, Jiménez TA, Paz AA, González-Candia AA, **Emilio A Herrera**. (*Laboratorio de Función y Reactividad Vascular, Pathophysiology Program, Institute of Biomedical Sciences (ICBM), Faculty of Medicine, University of Chile, Chile*).

**A novel approach to intrauterine chronic hypoxia in animal models: Assessment of ductus venosus in guinea pigs.**

6.30 p.m. **closing of the day**

# THURSDAY, OCTOBER 7<sup>th</sup>, 2021

9.00 a.m.

## ORAL SESSION VIII

### **CARDIOVASCULAR DEVELOPMENT**

**Keynote Lecture 8: Beth Allison (Melbourne, Australia)**

**The impact of fetal growth restriction on blood vessel function in the neonatal period and the cardioprotective potential for Melatonin**

**Chairs**

**Gina Galli (Manchester, UK), Felipe Beñaldo (Santiago, CHILE)**

9.30 a.m.

## ORAL PRESENTATION VIII

**1. Nima Moghaddas**, Beth J Allison, Youguo Niu, Kimberley J Botting, Carmel M McEnery, Dino A Giussani. (*University of Cambridge, Cambridge, United Kingdom*).

**Measurement in vivo Arterial Stiffness in Fetal Life.**

**2. Steven KS Cho**, Jack RT Darby, Brahmdeep S Saini, Mitchell C Lock, Stacey L Holman, Sunthara R Perumal, Christopher K Macgowan, Mike Seed, Janna L Morrison. (*Faculty of Medicine, University of Toronto, and SickKids Hospital, Toronto, Canada*).

**Comprehensive maternal and fetal hemodynamics assessed by cardiovascular MRI in the setting of late gestation maternal undernutrition in a sheep model of human pregnancy.**

**3. Makoto Tsuji**, Shintaro Mak, Naosuke Enomoto, Kota Okamoto, Asa Kitamura, Shoichi Magawa, Sho Takakura, Masafumi Nii, Kayo Tanaka, Hiroaki Tanaka, Eiji Kondo, Tomoaki Ikeda. (*Department of Obstetrics and Gynecology, Mie University Graduate School of Medicine*).

**The evaluation of feto-placental perfusion on tadalafil treatment for fetal growth restriction.**

**4. Isabella Inzani**, Denise S Fernandez-Twinn, Thomas Ashmore, Heather L Blackmore, Susan E Ozanne. (*University of Cambridge, Institute of Metabolic Science-Metabolic Research Laboratories (IMS-MRL)*).

**Maternal diet-induced obesity during pregnancy sex-specifically impairs cardiac function in the adult mouse offspring.**

**5. Rachael C Crew**, Yutthapong Tongpob, Nikhilesh Bappoo, Georgia Khinsoe, Barry Doyle & Caitlin S. Wyrwoll. (*School of Human Sciences, The University of Western Australia, Australia*).

**Exploring the fetal-placental vascular network in growth-restricted pregnancy: New perspectives on an established model.**

**6. Mitchell C Lock**, Kerri LM Smith, Youguo Niu, Olga V Patey, Sage G Ford, Andrew W Trafford, Dino A Giussani, Gina LJ Galli. (*Division of Cardiovascular Sciences, School of Medical Sciences, The University of Manchester, UK*).

**Maladaptive Cardiomyocyte Calcium Handling in Offspring of Hypoxic Pregnancy: Intervention with Melatonin.**

11.00 a.m. **Break**

12.30 p.m.

**ORAL SESSION IX****NEW PERSPECTIVES IN PERINATAL MEDICINE**

Keynote Lecture: Maurizio Mandalà (Cosenza, Italy)

**Remodeling of the maternal uterine vasculature during pregnancy****Chairs**

Anna Maria Nuzzo (Turin, Italy), Mitchell Lock (Manchester, UK)

1.00 p.m.

**ORAL PRESENTATION IX**

**1. Tayla R Penny**, Ashalyn Watt, Yen Pham, Amy E Sutherland, Madeleine J Smith, Joohyung Lee, Graham Jenkin, Michael C Fahey, Suzanne L Miller, Courtney A McDonald. (*The Ritchie Centre, Hudson Institute of Medical Research*).

**Expanded Umbilical Cord Blood Cell Therapy for Hypoxic Ischemic Brain Injury.**

**2. Sofia Passaponti**, Leonardo Ermini, Giulia Acconci, Filiberto Maria Severi, Luana Paulesu, Francesca Ietta. (*University of Siena, Italy*).

**The placenta and the fetal brain: focus on astrocytes.**

**3. Olga V Patey**, KL Botting, Y Niu, L Zhang, SG Forl, W Tong, C Coutinho, B Thilaganathan, DA Giussani. (*Department of Physiology Development & Neuroscience, University of Cambridge, UK*).

**Translatable In Vivo Fetal Cardiac Geometry and Function in Hypoxic Pregnancy: A Comparison Between Human Fetal Growth Restriction (FGR) and Progressive Hypoxic Pregnancy in Sheep.**

**4. Ina Rohwedder**, L Wackerbarth, K Heinig, A Ballweg, C Nussbaum, J Alstötter, M Ripphahn, M Salvermoser, T Straub, M Gunzer, M Schmidt-Suprian, C Schulz, A Ma, B Walzog, M Heinig, M Sperandio. (*Institute of Cardiovascular Physiology and Pathophysiology, Munich, Germany*).

**A20 and the non-canonical NF- $\kappa$ B pathway as key regulators of neutrophil function in fetal ontogeny.**

**5. Shoichi Magawa**, Christopher A Lear, Michael J Beacom, Victoria J King, Michi Kasai, Robert Galinsky, Tomoaki Ikeda, Alistair J Gunn, Laura Bennet. (*Mie University Obstetrics and Gynecology*).

**Fetal heart rate variability is a biomarker of rapid but not progressive exacerbation of inflammation in preterm fetal sheep.**

**6. Monique GM Willems; Daniele Panichi; Reint K Jellema; Daan RMG Ophelders; Maria Nikiforou; Nico Kloosterboer; Danilo AW Gavilanes; Steffen Kunzmann; Tammo Delhaas; Tim GAM Wolfs; Boris W Kramer.** (*Department of Pediatrics; Department of BioMedical Engineering; School for Oncology and Developmental Biology, Maastricht, NLD*).

**Effects of global hypoxia-ischemia and mesenchymal stem cell treatment on preterm ovine lungs.**

2.30 p.m.

**Break**

OCT7<sup>th</sup>, 2021

4.00 p.m. **DAWES LECTURE**  
Vassilios Fanos (University of Cagliari, ITALY)  
**PERINATAL, CLINICAL AND EXPERIMENTAL METABOLOMICS**  
Chairs: Anna Maria Nuzzo , Alessandro Rolfo (Turin, ITALY)

6.00 p.m. **Prizes and Closing**



**PROVIDER N° 3875 AND ORGANIZING SECRETARIAT**

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