

Fetal Connections



Dear Colleagues,

The Planning Committee for the *2016 International Symposium on the Fetal Brain* sends our greetings! We are excited that our September 15-16 symposium here in Washington, DC, is quickly approaching. In advance of this event, we are dedicating the Summer 2016 issue of *Fetal Connections* to providing a first glimpse of the topics, ideas, and faculty that have shaped the content of this foundational event.

In lieu of his traditional introductory *Dear Colleagues* letter, this issue will include a Q&A session with Dr. du Plessis about the symposium, including the ideas that sparked his creative push for this inaugural, multidisciplinary event.

On page two, we delve further into the impressive research backgrounds of a few members of our exciting symposium faculty and highlight the topics they will be presenting throughout the ISFB.

You can find further details about this CME- and CEU-accredited symposium, including the biographies for our six other renowned international faculty, at ChildrensNational.org/ISFB2016 – registration ends August 31st.

We look forward to collaborating with you in September!

Best wishes,
The 2016 ISFB Planning Committee

Highlights on our Symposium Faculty:

For biographies of our six other symposium faculty, please see our event website at ChildrensNational.org/ISFB2016.



Ahmet Baschat, MD
*Director, Center for Fetal Therapy,
Johns Hopkins Hospital
Professor of Gynecology and Obstetrics,
Johns Hopkins School of Medicine*

Talk Topic: Fetal Growth Restriction:
Mechanisms of Chronic Cerebral
Hypoxemia and Hypoperfusion in
the Fetus

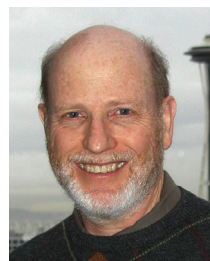
Research Focus: Dr. Baschat's research interests include interventions and management techniques for fetal growth restriction and placental insufficiency. He also has done extensive research on the use of high resolution prenatal ultrasound techniques, including Doppler and fetal echocardiography, to predict and detect fetal complications. His areas of clinical expertise include prenatal treatment of intrauterine growth restriction and fetal interventions for twin-to-twin transfusion syndrome (TTTS), as well as other complications of monochorionic twin pregnancies.



Yehezkel Ben-Ari, MD
*President, Acting Chief Executive
Officer, and Co-founder, Neurochlore
Director and Electrophysiologist, INMED*

Talk Topic: Maturation of Fetal
Neurotransmitter Systems: Critical Events
in Normal and Abnormal Development

Research Focus: A physiologist and biophysicist, Dr. Ben-Ari has made many seminal discoveries on brain developmental sequences, infantile and adult epilepsies, the mechanisms of migration disorders, and anoxic insults. These include the excitatory /inhibitory shift of GABA actions during brain development, the excitatory actions of GABA in epilepsies and other brain disorders, the formation of aberrant synapses in the epileptic brain, and the maturation of neuronal and network activities and associated sequences. Dr. Ben-Ari has recently suggested two major concepts including the "check point" and "neuroarcheology" concepts that suggest that neuronal activity controls the correct implementation of developmental sequences, and a failed implementation of the program leads to delayed maturation of electrical properties of misplaced and misconnected neurons that in an adult brain will conserve immature features. This paves the way for novel therapeutic strategies based on the use of agents that specifically block immature channels and transporters. This strategy has been used successfully with our diuretic approach to treat ASD and epilepsies.



William B. Dobyns, MD
*Medical Geneticist and Pediatric
Neurologist, Seattle Children's Hospital
Professor for the Center for Integrative
Brain Research at the University
of Washington*

Talk Topic: Advances in our
Understanding of the Genetic Basis of
Brain Development

Research Focus: Dr. Dobyns leads a broad-based research program investigating the nature and causes of a wide range of human developmental brain disorders. These include malformations of the forebrain, mid-hindbrain (brainstem and cerebellum), and cerebral cortex, as well as a wide spectrum of developmental disabilities including autism, intellectual disability, early childhood "developmental" forms of epilepsy, and complex developmental disorders combining several of the above. His work includes recognition and delineation of specific conditions, identification of numerous underlying genes, and detailed phenotype and genotype-phenotype analysis. The methods used in his lab include most standard molecular genetics methods plus fluorescence in situ hybridization, chromosome microarrays (comparative genome hybridization), RNA expression arrays, methylation-sensitive assays for X inactivation, standard (Sanger) sequencing, and most recently high-throughput exome sequencing.



David Edwards, MD
*Director of the Centre for
the Developing Brain,
King's College London*

Talk Topic: Development of Intrinsic
Network Connectivity During Brain
Maturation

Research Focus: The aim of the Centre for the Developing Brain is to reduce the incidence and severity of neurological impairment caused by problems around the time of birth. Dr. Edwards and his colleagues have developed a bench-to-bedside research strategy to investigate the mechanisms of perinatal brain injury in order to find effective therapies and have developed the first successful treatment for birth asphyxia, hypothermic neural rescue therapy. They have a dedicated neonatal MRI suite cited in the neonatal intensive care unit of St Thomas' Hospital and use imaging and neuroinformatic analysis to study brain development and damage.

Q&A with Dr. du Plessis



Our editor sat down with Adré du Plessis, MBChB, MPH, to ask him about the inspiration behind hosting the first International Symposium on the Fetal Brain:

Q: What sparked your decision to hold this inaugural event?

A: In many ways, this symposium is long overdue. In the past few years, understanding of the fetal brain has advanced across a broad spectrum of disciplines in centers around the world. One major impetus has been the advance of fetal brain imaging, which has provided investigators with new tools to study the evolving processes of normal and abnormal brain development. The time has now come to bring experts working in the field into the same forum to assess where we are and where we need to go next.

Q: What are you most looking forward to from the symposium?

A: We've been very fortunate in being able to assemble a veritable powerhouse of speakers - a literal 'who's who' in their respective fields. All of our first choice speakers, from pioneers to bright rising stars, accepted the invitation. For me, I know the most exciting part will be seeing what new unexpected insights are sparked when these leaders are brought together to share ideas from their different medical, research, and geographic backgrounds.

Q: Why is it so important that this event be multidisciplinary?

A: Making this a multidisciplinary event to the degree that it is was not an easy decision. However, the pathways culminating in abnormal fetal brain development are so varied, and run through the territory of so many different disciplines and specialties, that this is the right thing to do in order to get a full picture of advances and understanding in the field. As I said before, there have recently been many important advances in traditionally distinct disciplines. In many ways, this meeting is a 'gathering of the tribes' and a debriefing from the frontiers.

Q: What outcomes are you looking for from this symposium?

A: My hope is that this symposium will be the beginning of a vigorous ongoing conversation, an arena where all those focused on the well-being of the immature fetal brain can exchange ideas and influence the direction of future investigative work in this field. Success, to us, would be participants leaving enriched, knowing way more than when they came, having formed new friendships and collaborations, and feeling energized until the next such meeting.



Eduard Gratacós, MD
Director and Professor, BCNatal, Hospital Clínic and Hospital Sant Joan de Deu, University of Barcelona

Talk Topic: The Fetal Origins of Neuropsychological Impairment Across the Lifespan: An Expanding Landscape AND Complicated Twin Gestation: A Serious Hazard to the Fetal Brain

Research Focus: As the leader of the Fetal and Perinatal Medicine research team at the August Pi i Sunyer Biomedical Research Institute (IDIBAPS) in Barcelona, Spain, Dr. Eduard Gratacós and his team have five main lines of research: (1) prematurity, (2) metabolomics and microstructure, (3) diagnosis and therapy in IUGR, (4) brain connectivity, and (5) fetal cardiovascular programming. The principal strategic objective for the research team is to search for solutions to prenatal diseases, identifying the mechanisms involved in fetal brain and cardiac reprogramming, and consolidate existing lines of work

in different fields, such as perinatal infections, HIV and neonatal infection, fetal therapy and surgery, screening strategies and prediction of fetal and maternal pathology in large populations, preeclampsia, and prematurity.



Michael Meaney, CM, CQ, FRSC, PhD
Scientific Director at the Ludmer Centre for Neuroinformatics and Mental Health, Douglas Mental Health University Institute

Director, Program for the Study of Behaviour, Genes and Environment, McGill University

Talk Topic: The Role of Epigenetic Mechanisms During Fetal Life on Postnatal Neurocognitive Outcome

Research Focus: Dr. Meaney's particular research focuses are on maternal care, stress, and gene expression. Individual differences



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FETAL BRAIN
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CME



Highlights on our Symposium Faculty:

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Michael Meaney, CM, CQ, FRSC, PhD

in maternal care can modify an offspring's cognitive development, as well as its ability to cope with stress later in life. Dr. Meaney was one of the first researchers to identify the importance of maternal care in modifying the expression of genes that regulate behavioral and neuroendocrine responses to stress, as well as hippocampal synaptic development. At present, Michael Meaney and his team of research assistants, postdoctoral fellows, and students are pursuing several lines of research, including the following: the molecular mechanisms by which maternal care alters gene expression, with an emphasis on genes involved in the regulation of endocrine responses to stress, such as the glucocorticoid receptor and the corticotropin-releasing factor (CRF) systems of the hypothalamic paraventricular nucleus and amygdala, which form part of the hypothalamus-pituitary-adrenal (HPA) axis; the effects of environmental enrichment on the development of the hippocampus and prefrontal cortex, with a focus on NMDA-stimulated synaptogenesis; epigenetic programming through maternal behavior; and epigenetic regulation of the glucocorticoid receptor in human brain associated with childhood abuse.

**Talk topics are not finalized titles.*

Upcoming Topics in Fetal Medicine

This innovative series, featuring fetal medicine subject experts, occurs every third Tuesday of the month at 7:30 am. To sign up for updates or view past sessions, visit ChildrensNational.org/Topics-FetalMed.

Delivery management of CDH

June 21: Dr. Billie Short

Fetal Arrhythmia – Diagnosis and Updates in Management

July 19: Dr. Anita Krishnan

Skeletal Dysplasias – What We Need to Know

August 16: Dr. Dorothy Bulas

Fetal Connections

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