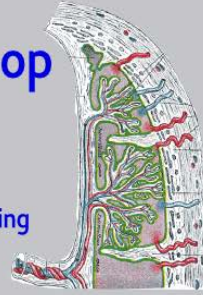


Placental MRI Workshop

04.07.2017

Large Seminar Room, 4th floor, Lambeth Wing
St. Thomas' Hospital, London



supported by



Report form the first UK functional placenta workshop at St. Thomas' Hospital in London on the 4th of July 2017

Our main motivation for organizing this workshop was to bring the various UK groups involved in functional placental research together for one day to facilitate the exchange of ideas and future collaboration by personal contact. To keep the workshop free of charge, we applied for and were granted funding from the New Initiative Fund of the British Chapter of the ISMRM to cover student travel stipends and catering.

We fixed the workshop date and broad agenda after surveying the interest of several research groups and advertised the workshop with our flyer both on several personal circulation lists, the British Chapter mailing list and by mouth-to-mouth propaganda.

We were thereby able to get 17 confirmed speakers for short presentations of current research projects and completed the agenda (given below) by inviting 3 distinguished speakers: Prof. Graham Burton from the Cambridge Trophoblast Research Center to cover placental physiology and biology, Prof. Stephen Robson from Newcastle to cover clinical applications and medical bases of placenta-associated diseases and Dr. Andreas Marnierides for an overview on placental pathohistology and manifestations of placenta disease on a micro/macroscale.

We were very positively surprised and excited about the great interest from the community for such a specific topic. We had a total of 82 participants, the majority attending the whole day, a subset attending morning / afternoon only. These included researchers from (UK based) KCL, Imperial College London, UCL, University of Manchester, University of Nottingham, University of Oxford, University of Cambridge, University of Sheffield, University of Newcastle, Guy's and St Thomas' NHS trust, Maidstone NHS trust and (international) Necker hospital Paris, Universidad de Barcelona.

While everyone was actively researching the function of the placenta, everybody had a different background and research focus. This allowed to think about new, different aspects in individual research topics which had not been considered before and could offer new ways to explore. Both the biological and histo-pathological invited talk found great interest among the MRI researchers, as they gave interesting and relevant background for ongoing and future projects. The invited clinical talk offered a fascinating clinical perspective including both areas where current clinical imaging with Ultrasound is seen as sufficient and where functional MRI can add valuable information.

The obtained feedback specifically mentioned the interdisciplinary agenda, the availability of student stipends and the informal setting facilitating lots of discussions.

In summary, this workshop was a great day with lots of communication between researchers from different groups and topics and already a couple of developing collaborative projects!

Finances:

We granted 6 student stipend applications of 50 Pound each (total 300 Pound). These were given to students fulfilling the student stipend criteria, set as (a) active participation in the workshop, (b) student/early career researcher and (c) home institution outside of London.

The catering costs were kept low thanks to the great help from the department (home-baked cakes, coffee/tee locally organized.) Sandwich lunch was ordered and supplemented locally with drinks and cakes.

We would like to thank the New Initiative Fund for their invaluable help in making this day possible by both their financial help and their help in circulating the information!

09:30-09:55 Arrival of the participants, coffee and tea

09:55-10:05 Welcome and Introduction, Prof. Mary Rutherford (KCL)

10:05-10:35 Placental physiology and biology, Prof. Graham Burton (Cambridge)

10:35-12:30 In-vivo functional placental imaging

(~10 min each + discussion time)

- Quantifying placenta microstructure with diffusion MRI, Paddy Slator (UCL)
- Oxygen-Enhanced and BOLD MRI in the detection of placental dysfunction, Emma Ingram (Manchester)
- Separation of fetal and maternal circulations in the placenta using multi-modal MRI, Andrew Melbourne (UCL)
- Placental Oxygenation and separation of fetal and maternal circulations, Simon Shah (Nottingham)
- Multi-modal assessment of placental function, Jana Hutter (KCL)
- Experimental design for quantitative placental imaging, David Owen (UCL)
- Mathematical modelling of placental flow and oxygenation, Igor Chernyavsky (Manchester)
- Fetal circulation modelling in IUGR fetuses, Patricia Garcia-Canadilla (UCL)
- MRI-based methods to detect placental and fetal brain abnormalities in utero in mice, Guillermina Girardi (KCL)

12:30-13:00 Sandwich lunch

13:00-13:30 Challenges

- Safety (SAR, Acoustic Noise), Shaihan Malik/Anthony Price (KCL)
- In-vivo placental MRI – Positioning and Location, Field Strength, Ana Dos Santos Gomes (KCL)
- Motion correction/Segmentation, Amir Alansary (Imperial College London)

13:30-14:00 Clinical Assessment of the placenta, Prof. Stephen Robson (Newcastle)

14:00-14:45 Placental Histo-pathology - a short introduction, Dr. Andreas Marnerides (GSTT, KCL)

14:45-16:00 Validation techniques

(~10 min each + discussion time)

- Utilising dual perfusion in the mapping of oxygen levels in ex vivo human placentas, Gareth Nye (Manchester)
- Correlation of MRI measurements to US/DUS techniques, Jackie Matthew (KCL)
- Fully automatic segmentation using machine learning, Pdraig Looney (Oxford)
- Experience with eternal ex-vivo placenta phantom, Laurence Jackson (KCL)

16:00 Wrap-up, coffee, cake