



## The 3rd Colloquium for Equine Reproduction

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Wednesday 17<sup>th</sup> April saw another fascinating and provocative Colloquium for Equine Reproduction, this year hosted by the BSAS Annual Conference at Nottingham University. We had a fantastic mixture of attendees representing the spectrum of equine reproduction specialists, from breeders and practitioners to researchers and students. Presentations included an intriguing insight into the influence of the placenta over future performance of the horse, an update on progress in the investigation of preimplantation factor in equine reproduction and a

review of the challenge of applying research findings in daily stud management. Summaries of these talks are included in this newsletter. A lively discussion of the challenges facing equine reproduction research followed the seminar program. Future research funding strategies and widening the participation of breed societies and governing bodies in events such as CFER were enthusiastically debated, as well their acceptance of innovative breeding techniques to enhance the potential of British bred sport horses.

### A Missing Link

A major issue raised in discussion at the meeting was the missing link between the generation of equine reproductive research and its availability to and use by industry breeders. Advances in knowledge, diagnostics, therapeutics and assisted reproduction techniques are reported monthly in peer-reviewed publica-

tions. While the application of the content of these publications could benefit the daily operation of the stud yard, news of them rarely reaches industry operators. Through this newsletter, CFER hopes to round-up and translate recent advances in equine reproduction research into a useful and applicable form.

### New CFER Website

The CFER website address has changed and can now be found at;

<http://users.aber.ac.uk/dmn/cfer/home/html>

The site has also been updated so please do take a look.

**The Colloquium for Equine Reproduction will return in 2015.**



Photo of the Colloquium for Equine Reproduction

## The equine placenta-a vital clue to neonatal problems

Sandra Wilsher, The Paul Mellon Laboratory, Email: [sandrawilsher@hotmail.co.uk](mailto:sandrawilsher@hotmail.co.uk)

Despite its massive responsibility to ensuring that the fetal foal is sufficiently developed and mature to make the transition from intra- to extra-uterine existence, little thought is given to the placenta following birth aside from a cursory check for completeness. However there is much to be gained from careful examination of this remarkable organ.

The placenta at parturition represents its final stage of development, but this organ has developed to be increasingly more complex over an 11 month period to meet the demands of the growing fetus. The overall size and shape of the placenta can reveal uterine abnormalities and illustrates the amount of 'space' the fetus had to develop in. The placentae of foals with flexural limb indicated changes representing uterine narrowing. The total surface area of the allantochorion and its microcotyledons is positively correlated with foal birth weight. Poor development of the allantochorion will limit the area available for nutrient exchange to the

fetus, and thus result in restricted growth, which may impact on the future potential of the neonate. Age, foaling history, maternal size and genotype influence allantochorion area, but insults such as poor nutrition and disease during gestation can alter placental and fetal development.

The umbilical cord should also be checked for normal development of the blood vessels within it. Cord length illustrates the impact this organ can have on the fetus, since a short cord may predispose to premature rupture in parturition and subsequent oxygen starvation, while long cords can easily become twisted or increase the risk of strangulation.

Further investigation of the structure and function of the remarkable placenta will allow for optimisation of mare management in gestation to give foals the best possible wellbeing in the uterus and the chance to reach their full athletic potential.

*There is much to be gained from careful examination of the placenta.*

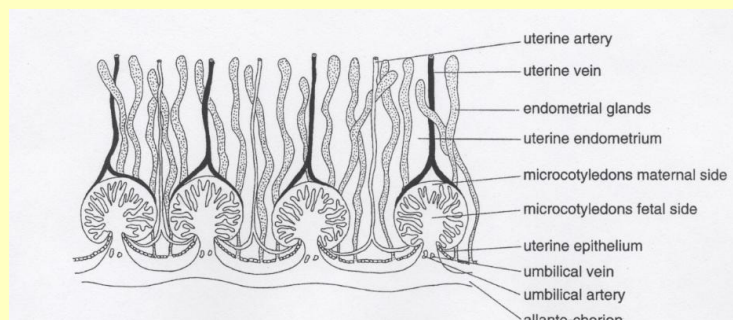


Diagram showing microcotyledon structure (kindly provided by M. Davies Morel)

## The application of Preimplantation Factor to clinical equine reproduction

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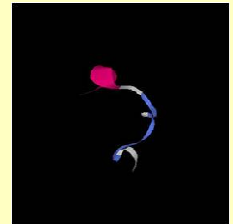
Preimplantation factor (PIF) is a small protein which is produced by viable embryos, and promotes its own development and influences the uterine environment to favour a successful pregnancy. Preimplantation factor can be identified in embryo culture media soon after conception, and embryos produce more PIF as their development progresses. A number of roles for this protein have been demonstrated including modification of the endometrium to favour implantation and modulation of the maternal immune system to create tolerance of the partially foreign embryo. Due to its ability to influence immunity PIF is currently being tested as a treatment in autoimmune conditions.

Recently PIF has been identified in equine placental tissues suggesting that it must be produced by equine embryos. Measurement of this protein in pregnant mare serum and development of a robust,

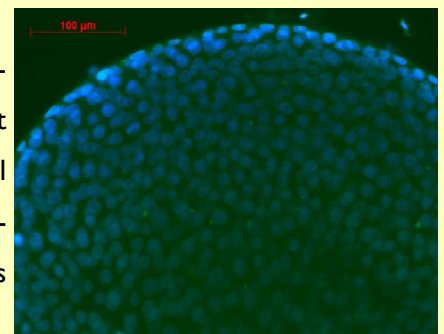
quantitative and easily applicable test for PIF could provide the breeding industry with a marker of embryo viability in early pregnancy and beyond.

Preliminary *in vitro* research has shown that PIF can down-regulate inflammation in the equine endometrium. Advancement of this research may provide a novel treatment for persistent mating-induced endometritis, a condition which affects around 15 % of thoroughbred brood mares and results in detrimental effects on fertility. As an immune modulator therapeutic PIF may provide an alternative to the steroidal glucocorticoid drugs currently employed in this condition.

There is a great deal more research needed into PIF before it can be introduced into clinical equine reproduction but its potential for this small peptide is wide ranging and exciting.



Theorised structure of PIF



Equine embryo with PIF binding

### Domestic Animal Endometritis Workshop Olsztyn, October 2013

Researchers from Aberystwyth University joined Europe's leading endometritis investigators and clinicians in Olsztyn for the first Endometritis as a Cause of Infertility in Domestic Animals Workshop.

Renowned equine reproduction special-

ists including Turtu Katilla and Tom

Stout were present. The meeting provided an opportunity to discuss current research into endometritis and forge a plan for its advancement.

## The researcher and the user in the field-a two way street or a stop sign?

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Each year, much scientific research is performed with the ultimate intent of assisting equine reproduction, but how much of this research ends up 'on the shelf', or used by only a few for many years before finally becoming 'mainstream'? What avenues are available for research to make its way through to the field, and for the practitioner or breeder to access that information? Conversely what issues are the practitioner and breeder facing that would benefit from research but never investigated because scientists are not aware of them?

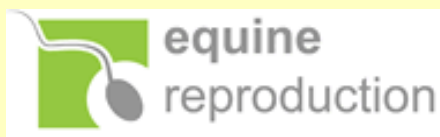
This presentation gave an overview of some often overlooked research with practical application related to equine breeding and pregnancy. Including;

- Use of a 1/10<sup>th</sup> dose of prostaglandin to successfully induce ovulation and promote oestrus, while avoiding the undesirable side-effects of the currently advocated dose.
- The cytology smear offers a fast reliable method of detecting inflammation in the uterus, and

should be used alongside regular swab culture methods to back up this diagnostic test.

- Use of anti-inflammatory treatments such as glucocorticoids and NSAIDs in mares susceptible to persistent mating-induced endometritis.
- Cloning and its values, apprehension about it and the options for registering clones and their progeny.
- The dogma of the 340 day pregnancy in mares; in reality normal gestation length can range from 320 to 370+ days.

While there are scientific meetings for researchers to gather and discuss research, and similar events for veterinarians and breeder groups, the opportunities for all three spheres of equine reproduction to come together on an even playing field are often limited. To optimise breeding performance and research channels of communication between 'the field' and 'the lab' must be developed.



[equine-reproduction.com](http://equine-reproduction.com)

## Colloquium for Equine Reproduction



CFER aims to provide a central meeting place for researchers, vets, breeders, students and industry professionals to share ideas, experiences and create a network where these individuals can come together.

<http://users.aber.ac.uk/dmn/cfer/home/html>