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Association Européenne de Transfert Embryonnaire
European Embryo Transfer Association

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President's letter

Dear Colleagues, dear friends,

How quickly time flies: The year 2015 has just started so fast with an excellent IETS meeting in Paris and now it's already July and we are facing our 31st Annual Meeting of the AETE - less than 300 kilometers away from the last IETS venue - in Ghent/ Belgium. And be sure, our new AETE venue and program are not less spectacular than Versailles.
Definitely it is hard to compete with a royal venue in Versailles/Paris – however Ghent is a beautiful medieval and very attractive city. In 2011, Ghent was called by Lonely Planet "Europe's best kept secret" and listed 7th in the top-ten of hottest cities worldwide. The LOC has chosen a very good place for the conference amidst impressive scenery, but will also provide an excellent social and cultural program.
The last months have been more than turbulent, but I enjoyed them because we have incorporated many new and innovative aspects into our recent AETE program. However I have to inform you firstly, that we have a change in our board:
In February Maria Datena from Italy has finished her work in the board of the AETE after prolonged and appreciated contributions to our association. I am sure we will miss her. I would like to thank her very much and the whole AETE family wishes her all the best for the recovery of her health.
Maria´s place in the board is now in hands of Daniel Le Bourhis from France. He was elected in Dresden beyond Marja Mikkola from Finland, who replaced

Hiemke Knijn from CRV/ Netherlands. We wish Daniel all the best for his work in our AETE board. He was immediately integrated into the manifold tasks of the board in preparation for our program in Ghent. Furthermore we improved our publishing activity within the AETE. The board is very happy with this new initiative of collaboration and the opportunity to join in for publication of our abstracts and the lectures in the established journal of Animal Reproduction. Many thanks for all their effort to Jo Leroy and Roberto Sartori from SBTE.

The Annual Meeting is the main function of our society and the Board spends a lot of time for an encouraging preparation. Furthermore, our society has evolved over the years and having a scientific program that suits all the members has become a real challenge. However the 2015 program is very promising and inspiring. We will have three invited lectures framed by 15 short oral communications, the long-established student competition and two workshops. One workshop will be leaded by Katrin Hinrichs from the States to continue the suspense moment from the new established preconference to our regular meeting. Besides we will have an interesting and very practical related workshop about the evaluation and biopsy of bovine embryos supported by RI LIFE SCIENCES. For the first time we incorporated a new Preconference Workshop into our program. The focus is on equine reproduction and is titled "A week of life of an equine embryo" and is moderated by Ann van Soom from Belgium. As you know, there is a strong equine research group in Ghent with good relations to our American and international colleagues and therefore it makes sense to use the facilities at the Ghent University and our meeting for such an attractive possibility. I am very sure that many of you are interested to join, however I have to admit that a different registration is needed via the AETE website; and furthermore it is combined with additional costs of 30 Euros and is limited to 30 participants. There are only few places available.

The other exciting news are that we installed the STUDENT´s Breakfast within our AETE Meeting. We want to strengthen the togetherness of the students and our organization. Jo Leroy as the head of the LOC will be the first host of this new and fresh event. Students who are interested in participating in an exciting group and gain proper experience to develop a great attribute and attitude to AETE should contact him very soon! This event is the approach to make this AETE meeting to the first meeting where PhD students take center stage! Prizes will be awarded to the best poster presentation, to the best oral presentation and to the student competition finalist.

A special honor and pleasure for me will be to overhand our 2015 AETE medal to the "grandfather" of the AETE Michel Thibier. Many of us remember his presentation last year via video and the sympathetic interview directed by our "AETE reporter" Serge Lacaze. This year we will have him naturally within the bosom of our family.

Saturday is the final day of the meeting, and for those of you who wish to stay another night, we are preparing a cozy get-together, or you can decide to visit ODEGAND. This is a very special and popular music event in this beautiful town. It has a long tradition. Therefore many tourists will come to visit this event at this weekend. Consequently, do not miss our early bird registration (15th July) and make your hotel reservation asap for our 2015 AETE Meeting in Ghent. See you soon!

Kind regards

Frank BECKER

President A.E.T.E

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Spying embryo-maternal secret dialogue in the oviduct for improving the success of reproductive biotechnologies

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Bidirectional embryo-maternal dialogue in the oviduct: myth or reality?

In mammals, maternal interactions with embryos are the basis for the success of any reproductive event (Rizos et al. 2002). The oviduct, or Fallopian tube, which is connecting the ovary and the uterus, plays a vital role in these interactions. It holds the maternal dialogue with gametes and early embryos and provides an optimal environment for embryo development. However, the mechanisms that govern the maternal communication with embryos are still poorly understood. Exploring the molecular interactions occurring during this embryo-maternal interactions in the oviduct will increase our knowledge of the specific factors that contribute to the success of the early reproductive events. This knowledge will be used to improve the clinical application of assisted reproductive technologies (ART) and ultimately will be translated into increased pregnancy rates and healthy offspring in both livestock species and humans.

It is widely accepted that as in any dialogue, the embryo-maternal crosstalk is a matter of two sides (Figure 1). On one side, there is a modulatory effect of oviductal epithelial cells (OEC) and oviductal secretions on embryo development *in vitro* (Cordova et al. 2014; Gandolfi et al. 1989; Mermillod et al. 1993). On the other side, the embryo(s) can also regulate the gene and protein expression of the oviduct (Alminana et al. 2012; Schmaltz-Panneau et al. 2014). However, recent studies are suggesting a third player in these interactions, exosomes/microvesicles, which could act as mediators in the bidirectional embryo-maternal cross talk (Burns et al. 2014; Ng et al. 2013). Disentangling the players and the molecular twitter message exchange between them in this unique communication system remains a challenging task (Ulbrich et al. 2013).

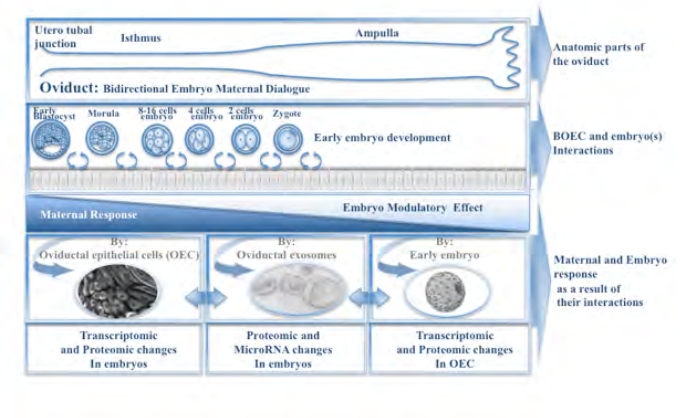

Figure 1. Embryo-maternal crosstalk

Maternal response from the oviduct to the embryo call

Several *in vivo* animal models with different approaches have been used to prove the real existence of an early embryo-maternal dialogue in the oviduct (Alminana et al. 2012; Lee et al. 2002; Maillo et al. 2015). Lee and colleagues (Lee et al. 2002) compared the gene expression pattern of mouse oviducts containing early embryos and oviduct containing oocytes. The presence of embryos induced alterations in the oviductal transcriptome profile compared to oocytes. Using a porcine model Almiñana and co-workers showed that the changes observed in the oviductal gene expression were dependent on the embryo developmental stage (Alminana et al. 2012), demonstrating a more specific response of the oviduct towards the embryo. In a more holistic study of the oviductal alterations, Maillo and colleagues (Maillo et al. 2015) have demonstrated that the early bovine embryo elicits an oviductal response during its transit through the oviduct that may contribute to its subsequent development. Although these authors have used a non-physiological model to prove this dialogue by transferring 50 embryos into the oviduct of a cow, the presence of multiple embryos in the oviduct induced differential transcriptional changes in OEC when compared to the gene expression responses to oocytes. In addition, the overexpression of one gene (KERA), induced by multiple embryos, was also detected under physiological conditions with single embryo (Maillo et al. 2015). This may indicate that the local modifications induced by embryos may be lost during whole oviduct analysis, only the most differential gene being detected in these conditions.

To further understand the signalling mechanisms of candidate genes identified in this dialogue, our laboratory developed an *in vitro* model using Bovine OEC (BOEC) from primary *in vitro* culture and bovine embryos (Cordova et al. 2014; Schmaltz-Panneau et al. 2014). Using this *in vitro* system we also confirmed that BOEC adapted their transcriptomic profile in response to embryo signalling (Schmaltz-Panneau et al. 2014). This study revealed 34 differentially expressed genes when BOEC were co-cultured with embryos for 8 days compared to BOEC without embryos (Schmaltz-Panneau et al. 2014). Most of these genes were associated to maternal immune response or involved in interferon type I signalling pathway. These results are in line with *in vivo* studies showing a immune maternal modulation by the embryo in the oviduct (Maillo et al. 2015) and the uterus (Alminana et al. 2012). Moreover, similar interferon tau (IFNT)-induced genes were identified in the bovine uterus in response to the conceptus (day 15-16), which has been associated to pregnancy recognition signals (Bauersachs et al. 2006; Forde et al. 2011; Forde et al. 2012; Klein et al. 2006; Mansouri-Attia et al. 2009). We hypothesized that embryonic signals, IFNT-dependent and non-dependent, could play a key role in maternal pregnancy recognition in the oviduct and in the uterus by activating a set of specific genes before and at the implantation period (Maillo et al. 2015; Schmaltz-Panneau et al. 2014).

To gain deeper insight into the oviductal ability to respond to embryo signalling the gene expression profile of different regions of the oviduct (Ampulla and Isthmus) were evaluated. IFNT related genes was significantly up-regulated when BOEC, either from Ampulla-BOEC or from Isthmus-BOEC, were co-cultured with embryos during 8 days (Cordova et al., 2013 personal communication). Moreover, the IFNT stimulation reproduced this embryo effect. In contrast, when the gene expression of known oviductal genes was evaluated (*GPX4, OVGP, C3*) a regional difference was found. Interestingly for those genes, the presence of the embryo did not elicit an effect on BOEC.

Together, these *in vivo* and *in vitro* studies have shown the existence of a real dialogue between the early embryo and the oviduct, as a result of which, the embryo regulates its own environment in the maternal tract. Moreover, an interesting specialization of each oviductal region in response to embryos through differential gene profile has been reported.

Early embryo response to the maternal environment

In this case, *in vitro* co-culture systems using embryo-oviductal epithelial cells (OEC) have proved to be a convincing approach to increase the blastocyst rates in human (Bongso and Fong 1993) and other mammalian species (Cordova et al. 2014; Rodriguez-Dorta et al. 2007) while bringing insights into this early embryo-maternal dialogue. Using our BOEC-bovine embryos culture system, different timings of co-culture on embryo development and their effect on embryonic gene expression were evaluated. BOEC-embryo co-culture during the first 4 days of embryo development increased blastocyst rates compared to the four last days, complete culture with cells (8 days) or to conventional culture without cells (control) (Cordova et al. 2014). Moreover,

BOEC co-culture with embryos for the first 4 days of embryo culture accelerated the kinetics of blastocyst development, with a significant increase in the number of blastocysts at days 6 and 7 compared to the rest of the cultures. In particular, BOEC from the isthmus were more capable of supporting early embryo development than BOEC from the ampulla, demonstrating a regional specialization of the oviduct in supporting embryo development (Cordova et al., 2013, personal communication). Given the fact that these two regions also have differential gene expression profiles, their comparative studies will help the identification of the most important BOEC genes involved in embryo development support.

Focusing on the embryo response towards the BOEC at the transcriptomic level, genes involved in embryo quality were altered as a result of BOEC effect. These embryonic gene alterations suggested a reduced apoptosis and increased capacity to adapt against stress after co-culture. In addition, the presence of BOEC at the very early stages of development (four days) elicited alterations of the transcription profile in the blastocyst up to four days later, suggesting a long-term regulation of gene expression that may involve epigenetic control.

Is there room for others players in this two-way embryo-maternal dialogue?

Recent studies indicate that exosomes could act as intercellular vehicles in the embryo-maternal crosstalk in the uterus (Burns et al. 2014; Ng et al. 2013; Ruiz-Gonzalez et al. 2015) and might also modulate the maternal-embryo interactions in the oviduct. Oviductosomes (Al-Dossary et al. 2015) and uterosomes (Burns et al. 2014; Ng et al. 2013; Ruiz-Gonzalez et al. 2015) have been identified recently, but it is still a mystery how they are taken up by embryos and whether they modulate the maternal interactions to promote successful pregnancy. On the embryo side, only one recent study has shown that *in vitro* produced embryos can secrete exosomes as a possible way of communication between them, allowing the exchange of mRNA involved in the maintenance of undifferentiated status (Saadeldin et al. 2014).

Exosomes are small (30-100nm) membrane vesicles of endocytotic origin that have been identified *in vivo* in all body fluids including follicular (da Silveira et al. 2012; Sohel et al. 2013), uterine (Burns et al. 2014; Ng et al. 2013; Ruiz-Gonzalez et al. 2015) and oviductal fluids (Al-Dossary et al. 2015) and can be secreted by most cell types *in vitro*. They specifically carry proteins, lipids, and genetic materials such as DNA, RNA, and microRNA that could be transferred to recipient cells, and may induce both immediate and epigenetic changes. Exosomes together with microvesicles (bigger vesicles around 50-1000nm with similar content) (Braicu et al. 2015; Dragovic et al. 2011; Gyorgy et al. 2011; Turiak et al. 2011) play fundamental biological roles in the regulation of physiological as well as pathological processes, which make them interesting diagnostic and therapeutic vectors (Suntres 2011).

Since primary OEC *in vitro* culture systems have been thoroughly used to study oviduct-embryo interactions in different species, it represents a suitable approach to study the role of the exosomes in this unique communication system. However, knowing the large differences between *in vivo* and *in vitro* embryos in terms of embryo quality and gene expression and the different morphologic characteristics and protein expression of OEC from *in vivo* and *in vitro* origin (Rottmayer et al. 2006), our laboratory decided to characterize the bovine oviductal exosomes from both *in vivo* and *in vitro* origin (Almiñana et al., 2015 personal communciation). For this purpose, exosomes secreted by OEC *in vivo* in the oviductal fluid and by OEC *in vitro* in the conditioned media after OEC primary culture were collected by serial ultracentrifugation. Preliminary results by dynamic light scattering analysis revealed different size distribution profiles compatible with exosomes and microvesicle populations from *in vivo* preparations and mostly microvesicle populations from *in vitro* preparations, whereas exosome size particles were clearly detected under transmission electron microscopy of *in vitro* preparations. Protein profile analysis by SDS-PAGE showed quantitative and qualitative differences among the exosomes samples, their cells of origin and the milieu (conditioned media or flushing). In addition, exosomes of *in vivo* and *in vitro* origin exhibited distinct proteomic profiles. For example, Western blot analysis demonstrated that *in vivo* exosomes expressed OVGP and heat shock protein A8 (HSPA8), oviductal proteins with known roles in fertilization and early pregnancy. However, only HSPA8 was detected in *in vitro* exosomes. In depth analysis of the content of these vesicles will bring new insights into the embryo-oviductal dialogue and will increase our knowledge of the oviductal environment that supports the early stages of embryo development.

Harnessing the power of embryo-maternal dialogue to improve reproductive biotechnologies

The evidence gathered here demonstrates the importance of the early maternal-embryo dialogue for the success of the early reproductive events. It is obvious to wonder whether the absence of these sophisticated interactions during ART are a major cause in their adverse outcomes. On the other hand, it is becoming evident that advances in farm animal reproduction are increasingly dependent on our understanding of the physiology of the reproductive events that allows to improve ART. Then, spying on the embryo-maternal secret dialogue will provid new insights

into the molecules and mechanisms that pilot this cross-talk, which offer great opportunities for improving ART.

Based on the beneficial effect provided by the BOEC bed during embryo culture, the BOEC-embryo co-culture system seems a suitable approach to improve *in vitro* culture conditions and decipher the mechanisms involved in this improvement. Moreover, the use of a sequential epithelial cells-embryo co-culture system, using BOEC in the first four days of bovine embryo culture and endometrial epithelial cells (EEC) in the last four days may increase the blastocyts rates and even represent a better approach. Both sequential embryo culture (Gardner and Lane 1998) and cell bed systems using endometrial (Dominguez et al. 2010) or oviductal (Cordova et al. 2014) epithelial cells have resulted in higher blastocyst rates and better implantation rates. It is obvious that the combination of both strategies in a unique sequential-cell system will mimic the maternal environment in a more physiological manner. Furthermore, this system may minimize the intracellular trauma (Gardner and Lane 1998) while satisfying the changing requirements of the preimplantation embryo as it develops and differentiates. In addition, this sequential epithelial cells co-culture system could be adapted easily to the different species by changing the duration of the oviductal or endometrial bed according to their spatial and temporal embryonic development. The proposed sequential cell co-culture system could also be used to help embryos to recover during the warming process after freezing or vitrifying/thawing process in amore natural environment, when direct embryo transfer is not applied.

On the other hand, exosomes could be an ideal approach to improve the success of reproductive technologies. Exosomes represent ideal natural nanoshuttles for carrying specific *in vivo* molecules that are not expressed in the *in vitro* OEC and EEC cultures. It is widely known that after a short *in vitro* culture of OEC or EEC, cells dedifferentiate and stop to secrete some molecules which may have important reproductive roles, such as the oviductal grycoprotein (OVGP1) (Schmaltz-Panneau et al. 2014). In addition, the use of cell-embryo co-culture is not the most suitable system for producing embryos because of costs, BOEC variability and sanitary risks. Exosomes could be a better strategy to improve the success of reproductive technologies. Exosome supplementation will bring a "cocktail" of *in vivo* oviductal proteins, miRNA and lipids to overcome the *in vitro* cultures deficiencies and promote successful pregnancy. Exosomes from different origins (*in vivo*/*in vitro*, oviduct/uterus) could be added during *in vitro* culture to feed the embryo with specific proteins, lipids and miRNA at the right moment. On the other hand, exosomes could be used as non-invasive biomarkers or as therapeutic assets in infertility and early pregnancy loss and also as sensors of embryo quality. Increasing our understanding of the exosome/microvesicle content and function will highlight the great potential for the use of these vesicles during ART.

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Significance and application of MOET in the small Ruminants in Turkey

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Introduction

Turkey has been recognized as having an animal production based on potential agriculture since ancient times. Small ruminants have been important components of rural life and still play a substantial role in the livelihood of farmers (Ocak et al., 2010). Turkey has been one of the major sheep and goat producers of Europe and the West Asia and North Africa (WANA) region in the 20th century. Sheep breeding is one of the most important agricultural sectors in Turkey, and is ranked second after cattle for meat production. Breeding of small ruminant in Turkey exhibited a reduction during last ten years. According to the data from Turkish Statistical Institute, the population for sheep and goat were about 27 and 8 million heads in 2012, respectively. The main reasons for the decreases in sheep and goats population were expressed by Ocak et al. (2010) as low market place, inadequate support policy by the state, migration of the farmers to big cities for new jobs, decrease in consumer demands, high costs of inputs, etc.

It is estimated that about 30% of sheep and goats population is reared for red meat production. In spite of this increase, the production is far from meeting the domestic demand. The production gap is estimated to reach 248 tons by 2018. In order to meet the growing demand, Turkey imports live animals and carcass meat. Over the last three years the annual average import of live animals was about 1,014,00 for sheep. According to the Turkish Beef and Lamb Producers Association (TUKETBIR), the current carcass yield is approximately 20 kg for sheep and goats. These figures are still lower than those of the EU. Local breeds are preferred in traditional farming. They are more adaptable to the harsh climate of eastern Turkey but are less productive. The share of sheep milk in Turkey's total milk production decreased drastically over the last few decades. Sheep milk constituted 20% of all milk production in 1980 and it is now only 6%. Although annual milk yield per animal increased to 48 lt for sheep and 56 lt for goats, these figures are less than half the EU average.

As its shown above figures that production characteristics of sheep and goats breeds in Turkey are relatively low, especially reproductive efficiency. The most important factor determining the success of sheep and goats production is reproductive efficiency, which is the net biological accomplishment of all reproductive activities i.e. puberty, oestrus, ovulation, fertilization, implantation, gestation and successful lambing and kidding as well as survival and growth after birth. For any trait affecting efficiency of meat and milk production, there is useful genetic variation among sheep and goats breeds worldwide. In this review, we will mostly focus on assisted reproductive Technologies integrated development strategies for sheep production.

When establishing a commercial sheep flock, producers are advised to select maternal-type sheep for their ewe flock and a terminal sire to produce large numbers of lambs with desirable carcass traits. This breeding program brings the question of acceptable way of introducing new genetic. Embryo transfer offers new opportunities for genetic improvement in sheep breeding. While this technique is still expensive and its use will mainly be for breed improvement, rather than in commercial production.

Doubling sheep production with Canadian genetics!

Importing frozen genetics (semen/embryos) from prolific and terminal breeds of sheep started in 2004. The

introduction of the prolific Romanov sheep became an appropriate strategy to improve the sheep industry in Turkey and The Turkish Ministry of Agriculture allowed importation of Romanov breed. Crossbreeding with Romanov started in 2005 and approximately 30 thousands Turkish local breeds of sheep were inseminated. Thereafter commercial MOET was used to establish nuclei flock of Romanov and terminal breed, Charollais, Suffolk and Dorper in Turkey in 2005-2012. Once nuclei flock of exotic breeds had been established, MOET was used to increase flock size. Approximately a thousand embryos produced in-vivo and transferred into recipient ewes from local breeds.

We planned to summarize scientific outcomes of MOET program conducted since 2005 and published mostly in AETE annual meetings. MOET was chosen a way of introducing new genetics with its advantageous documented by Saberivand and Outteridge (1996) who indicated that MOET has the added advantage of allowing imported stocks to develop in recipients well adapted to local conditions and can be used as a means for disease resistance in the breeding objectives and breeding strategies in either indigenous or other susceptible sheep. The success of this technology is a main determinant for suitability and feasibility of breeding program in developing countries. The success of embryo transfer depends on factors associated with the embryo, the recipient or an interaction among factors of the embryo and recipient. Therefore, the purpose of this review is to summarize the large scale experiments to characterize the effects of the embryo (genotype, fresh or frozen (traditional method or vitrified), stage of development, quality grade, no of embryos transferred (single versus twin) and the effects of the recipient (genotype, no of the CL at time of transfer, CL and transfer site, season of transfer) on the success of interbreed embryo transfer.

Significance of recipient breed!

Recipient "uterine" genotype has an important impact on interbreed embryo transfer. Embryo transfer technology enables experimental manipulation of genotypic combinations of embryos (donors) and uteri (recipients), affording unique opportunities to study genetic control of embryonic survival and growth. No nation-wide census has been carried out so far about animal genetic biodiversity. It is estimated that there are 17 breeds of sheep and we worked with seven different breeds raised in different region in Turkey. The breeds were Morkaraman (Redkaraman), Akkaraman, Kangal, Awassi, Tuj, Daglic, Kivircik.

The first imported frozen embryos from Romanov breed were transferred into Awassi breed of recipient at day 6 after estrus and resulted with 60% of pregnancy rate when morulla stages of embryos used, however, early blastocyst and blastocyst stages of embryos were resulted with significantly lower pregnancy rates (25%). The result of first trial brought a question of differences of embryo development stages between prolific and nonprolific breeds. Maternal and embryonic genetic effects were studied with three breeds of local fat tailed sheep (Awassi, Redkaraman and Tuj) and two embryo genetics such as prolific Romanov sheep and terminal breed Charollais. Overall MOET success (no of lambs born/no of embryos transferred) in frozen twin embryo transfer was 53%, 48% and 57% for Awassi, Morkaraman and Tuj, respectively. When it is computed within the interaction of recipient and embryo genotypes, Awassi x Romanov (60%) and Tuj x Romanov (64%) groups of recipient were pronounced as better recipients with 15-20% higher overall MOET success compared to other interaction groups of native breeds. Following experiments were conducted to study effect of the time to estrus following the synchronization program in recipient ewes and origin of embryos collected from specific donors. Frozen thawed embryos were used for evaluation factors intrinsic to donor and recipient. Pregnancy rate was found significantly ($P<0.0001$) higher (67%) in recipients showed estrus within 60 h after sponge removal compare to those estrus occurred 36h (33%) and 48 h (31%) after sponge removal. Pregnancy rate varied between 22 % to 78 % for eight embryo donors and pregnancy rates differed significantly ($P<0.001$) among

donors. The results show that, the time to estrus following the synchronization program, donors have played an important role in fertility of recipient ewes.

Can sex ratio be altered by ET?

It is desirable to control the sex of embryo transfer offspring. Embryo sex ratio after superovulation has not been widely investigated in sheep. The objective of the present study was to investigate sex ratio of embryos resulting from super stimulated donors from prolific and terminal breeds of sheep. Percentages for female sex ratio of offspring born from frozen thawed embryos was 64% ($P < 0.05$) for recipient carried Romanov embryos (79%) was significantly higher ($P < 0.05$) than those carried Charollais embryos (57%). There was an advantage in the sex ratio obtained when using super stimulated ewes from prolific breed.

Do season of MOET and breed category really matter?

The effect of season (Fall, Winter, Spring) on the superovulatory response and embryo quality in the prolific Romanov breed were studied. The overall success rate of MOET programs depends on not only the ovulation rate achieved, but also on the fertilization and embryo recovery rate. We found that the highest ovulation rate was observed with 20.14±2.38 in spring but resulted with the lowest (8.00±2.59) no of transferrable embryos. Embryo recovery rate (% no. of embryos/CL) was highest in winter (77%) season compared to fall (52%) and spring (40%) seasons.

The breed of sheep was categorized as prolific (Romanov and its F1, G1 crosses), mutton (Charollais and its F1 crosses) and fur (Karakul) to study if it is a source of variation in embryo production. The most transferable embryos were collected from prolific breeds (8.75±2.00), and followed by mutton (4.7±2.62) and fur (4.0±4.01). Superovulatory response to superovulation varied between breeds (prolific: 75%, mutton: 85%, fur: 60%) but this did not account for mutton and fur breed differences in total CL number and embryo production. It was concluded that the donor ewe breed was a significant source of variation in the results of embryo transfer.

New superovulation protocols!

The most widely used protocols for superovulation consist of 14 d of progesterone exposure, with FSH treatment. The use of a shorter progesterone treatment should be sufficient which avoids maintenance of persistent follicles in sheep Menchaca et al. (2009). We evaluated the superstimulatory response in ewes by using short term (ST) progesterone treatment (8 d) along with one dose of GnRH given 24 h after progesterone treatment cessation compared with the Traditional Protocol (TM). Estrus and superovulatory response did not differ between donors in TM (100%; 100%) and ST (100%; 83%) groups. Even though uvulation rate was found significantly higher in ewes in TM compared to ST, the number of transferable embryos were similar in both groups (TM: 8.33±3.56; ST: 8.00±2.33). It was concluded that short term progesterone treatment along with GnRH administration is recommended due to the similar embryo yields.

The superovulatory response and embryo yields were studied in Dorper ewes raised in southeast of Anatolia. The ewes were divided into four superovulation treatment groups such as; Exp. I: 12ml Folltopin + 200 I.U. eCG ; Exp. II: 10ml Folltropin + 200 I.U. eCG; Exp. III: 10 ml Folltropin + 600 I.U. eCG and Exp. IV: 10ml Folltropin + 750 I.U. eCG with single shot of FSH at CIDR removal. The only significant difference was observed in embryo recovery rates. Donors in exp. II and III were recorded with 63% embryo recovery rates while donors in exp I (38%) and IV (43%) resulted with significantly lower ($P<0.05$) recovery rates. In conclusion, it was found that Dorper ewes treated with different superovulation protocols out of season (May) yielded on average in 6 transferrable embryos and a single FSH injection can replace decreasing doses of multiple FSH injections.

Conclusion

The ten years intensive application of ET technology indicated that breed substitution and crossbreeding programs are successful thanks to compatibility of the genotypes with farmers' breeding objectives and production system. Litter size and lambing frequency were increased per enterprise to stay straight in the current meat markets. The LAI and MOET technologies applied in breeding strategies under the Turkey condition were able to increase reproductive efficiency and rates of animal genetic improvement, thereby contributing to an increased output from the livestock sector. They also offer potential for greatly extending the multiplication and transport of genetic material and for conserving unique genetic resources in reasonably available forms for possible future use.

Remembrance of Dr. Steph Dieleman

At the age of 70 Dr. Stephanus Jacobus Dieleman passed away on February 12th 2015.

For over 35 years Steph Dieleman was associate professor and head of the Laboratory of Biochemistry of Animal Reproduction at the Department of Farm Animal Health, Faculty of Veterinary Medicine, Utrecht University, The Netherlands.

Steph Dieleman has been recognized worldwide by his scientific and personal research contributions in the field of animal reproductive biology and reproductive technologies
Steph Dieleman was an active member of the AETE, attended and contributed annual meetings and organized the AETE annual meeting in Rolduc, Kerkrade, The Netherlands. In this view he was awarded as an honored AETE medalist in 2007, Sardinia, Italy.

Steph Dieleman was an active member of the IETS and elected in the Board of Governors (1997-2001), acting as Treasurer (1998-1999) and President 1999. Steph Dieleman was Program Chair and Organizer of the annual IETS meetings in Nice (1997) and Maastricht (2000) and was in the Local Organizing Board for the annual meeting in Hannover (2013).

We will remember him as a warm and sincere person, a devoted scientist and an inspiring teacher for many young and talented scientists by contributing to their scientific careers.

We wish his wife, closely affiliated family, friends and colleagues strength with bearing this loss.

Peter Vos and Bart Gadella
Utrecht University
Faculty Veterinary Medicine
Department Farm Animal Health
Section Animal Reproduction

Remembrance of Dr. Julio de la Fuente

It is with much regret that we announce the death of Dr. Julio de la Fuente, aged 62, on March 13th 2015.

For over 30 years Julio de la Fuente was Senior Scientist and Head of the Laboratory of Assisted Reproduction in Cattle at the Department of Animal Reproduction, National Institute of Agriculture and Food Research and Technology (INIA), Madrid, Spain.

He was recognized for his scientific contributions in the field of Embryo Transfer technologies and conservation of animal genetics in domestic and wild animals.

Julio was an active member of the European Embryo Transfer Society (www.aete.eu) since the early 90s, and attended and contributed to the annual meetings of the society regularly. He organized the 2000 AETE annual meeting in Santander, Spain.

He will be remembered as a warm person and dedicated scientist.
Our thoughts are with his wife, Susie, and his two children, Lucia and Sebastian, as well as his wider family, friends and colleagues at this sad time.

Alfonso Gutierrez-Adan and Dimitrios Rizos
Department of Animal Reproduction
National Institute of Agriculture and Food Research and Technology (INIA)
Madrid
Spain

Upcoming Events

EPICONCEPT – Conference 2015
Epigenetics and Periconception Environment
COST Action FA1201
6-7 October 2015,
Hersonissos, Crete, Greece
For more information, please visit the COST web site at: http://cost-epiconcept.eu/conference_2015.html

American Embryo Transfer Association **(AETA)** & Canadian Embryo Transfer Association **(CETA/ACTE)**
Joint Annual Convention
October 15-17, 2015
Sheraton on the Falls
Niagara Falls, Ontario, Canada
For more information, please visit the CETA/ACTE web site at: http://ceta.ca/convention.html
or the AETA web site at: http://www.aeta.org/2015/

42nd Annual Conference of the International Embryo Transfer Society **(IETS)**
January 23-26, 2016
Louisville, Kentucky
The Galt House
For more information, please visit the IETS web site at: http://www.iets.org/2016/

18th International Congress of Animal Reproduction **(ICAR)**
26 -30 June 2016
Tours, France
For more information, please visit the ICAR web site at: http://www.icar2016.org/

Pre-conference Workshop

"A week in the life of an equine embryo"

will be held on Thursday 10th of September, 14 -18h at the **Faculty of Veterinary Medicine, Department of Reproduction**, Obstetrics and Herd Health, Merelbeke, Belgium. www.aete.eu

For REGISTRATION: please send an email to jan.govaere@ugent.be to finally register; payment of Euro 30,- has to be performed on the AETE bank account

Invitation to the 31st Annual Scientific Meeting of AETE, September 11th to 12th 2015 in Ghent Belgium

Dear colleges and friends,

On behalf of the European Embryo Transfer Association the local organizing committee chaired by Dr. Ann van Soom, University of Ghent and Dr. Jo Leroy, University of Antwerp, Belgium, cordially invites you to the 31st scientific meeting of the organization in Ghent, Belgium, from the 11th to the 12th of September 2015.

For further information about the conference visit the AETE website www.aete.eu

Yours sincerely

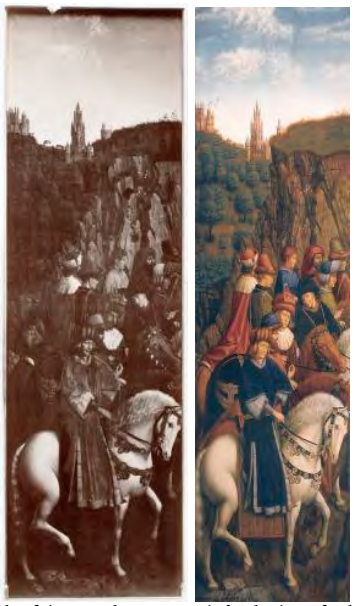
AETE LOC (in Alphabetical order)
- **Peter Bols (UA) - peter.bols@uantwerpen.be**
- **Stefan Deleuze (Ulg) - s.deleuze@ulg.ac.be**
- **Jan Govaere (Ugent) - jan.govaere@ugent.be**
- **Jo Leroy (UA) - jo.leroy@uantwerpen.be**
- **Geert Opsomer (Ugent) - geert.opsomer@ugent.be**
- **Katrien Smits (Ugent) - katrien.smits@ugent.be**
- **Ann Van Soom (Ugent) - ann.vansoom@ugent.be**
- **Peter Vercauteren (CRV) peter.vercauteren@crv4all.com**
- **Sandra Willaert (Ugent) - sandra.willaert@ugent.be**

The 31st Scientific Meeting of the A.E.T.E

Will be held in

Ghent, Belgium

11TH-12TH SEPTEMBER 2015



Original (left) and copy (right) of the Just judges

Welcome to Ghent….a wonderful city

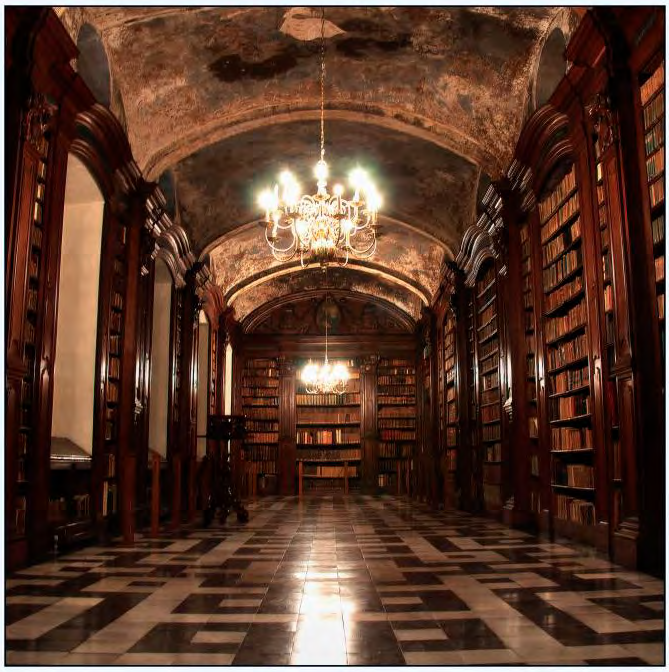
Ghent is a beautiful medieval city in the heart of Europe. In 2011, Ghent was called by Lonely Planet "Europe's best kept secret" and listed 7th in the top-ten of hottest cities worldwide: http://www.lonelyplanet.com/usa/new-york-city/travel-tips-and-articles/76165

View of the Graslei from the Korenlei.

For those interested in medieval architecture, the well preserved center of Ghent offers a lot to visit, such as the old Castle of the Counts (Gravensteen), and the Three Towers of Ghent, including the Saint Bavo's cathedral which holds the infamous painting of the Mystic Lamb by the brothers Van Eyck, of which the panel of the Just Judges was stolen in 1934 and has not been retrieved ever since http://www.arrivalguides.com/en/Travelguides/Europe/Belgium/Gent/thecity

Water is prominently present in Ghent. On Saturday 12th of September 2015, there will be a cultural manifestation called ODEGAND, which is phonetic French for "Water of Ghent" http://www.odegand.be/en/about-odegand
During that festival which is held throughout the city, people can enjoy different styles of music, from jazz to world music and can travel from one gig to the other on the channels by means of little boats.
That is also a reason to book your trip to Ghent early: it is a popular tourist destination and hotels may be fully occupied already a few months before the meeting.

Both science and pleasure will be combined at this AETE-meeting.
For those of you arriving early, a workshop on horse ART ("A week in the life of a horse embryo") will be organized at the Faculty of Veterinary medicine, only a 15 minute drive from the city centre of Ghent (transport from the congress venue and back will be organized). We will be back in time to taste some lovely abbey beers at the Welcome reception in the medieval and beautiful **Conference Venue: the Augustijner abbey** (Academiestraat 1, 9000 Ghent, Belgium - http://www.thagaste.be/), where the registration will take place as well as the rest of the scientific programme. For those interested, a part of the abbey can be visited that evening in a guided tour, including the impressive library and the chapel.



Library of the Augustijner Abbey

The AETE meeting in Ghent will be the first meeting where the PhD students take center stage! Prices will be awarded to the best poster presentation, to the best oral presentation and to the student competition finalist. A special breakfast is served only for the students, where they have the chance to talk and discuss with one of the more established senior scientists.
The programme of the AETE meeting is available on the website (http://www.aete.eu/), and after a first day of science on Friday, we invite you to have dinner in the Sint-Pieters Abbey, which is located at the other side of Ghent, but still within walking distance, since the old part of Ghent is fairly small. If the weather allows it, we can have the reception in the herb garden of the Abbey, followed by a diner in the crypts, and a dancing party.

Sint Pieters Abbey, near the Sint Pieters Square

Saturday is the final day of the conference, and for those of you who wish to stay another night, we are preparing a cosy get-together, or you can decide to visit ODEGAND.
We truly hope you will come to visit Ghent and meet some old friends again, and make some new ones.
It is definitely worth the trip!

The LOC

HOW TO COME TO GENT FROM BRUSSELS (NATIONAL AIRPORT)

Gent is easily reached by train (Gent Sint-Pieters-station) from Brussels airport (Zaventem). Direct trains run from Brussels airport, or you can change in Brussels. But be aware that if you change in Brussels some trains take much longer than others.

At Brussels airport you go to the lowest level (by following the signs) and there you can take the train.

Should you want to look for possible **train connections**: there is the official web-site from the Belgian Railways:
http://www.belgianrail.be/en/Default.aspx

- From: BRUXELLES-NAT-AIRPORT
- to: GENT-SINT-PIETERS
- enter when you want to leave or arrive
- click on the "timetable and buy tickets" button.

  You can also select to see this web-site in Dutch, French or German (top of page at the right : NL, FR or DE).

  How to come from the station in Gent to the city centre

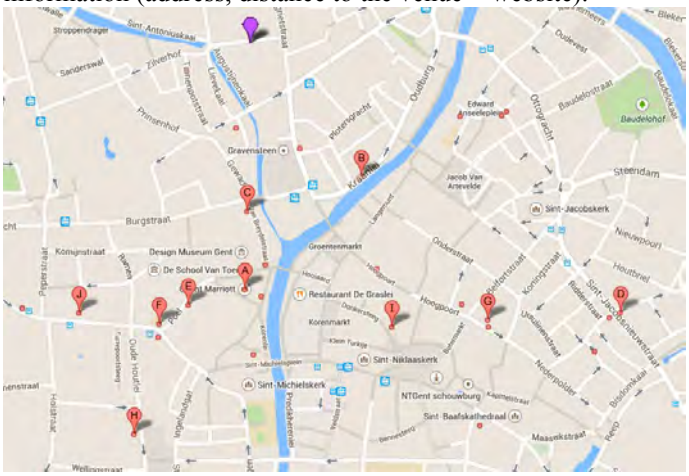
  The cheapest way to go from the railway station to the centre of Ghent is by **tram**. Several trams go to the centre directly (e.g. tram nr. 1).
  There is an information desk next to the railway station exit (at your left).

  By bus is another option, but this might be a bit more complicated. You can of course also go by taxi, but this is a lot more expensive.

Hotels AETE

We advise people to book their room :
http://**www.booking.com**/index.en-gb.html?sid=1a75cbd4da8692a3eaecab55c91a2370;dcid=4

Below you find a map with the conference venue: Augustijnenklooster and some hotels nearby + some extra information (address, distance to the venue + website).



Purple:
Conference Venue: **Augustijnenklooster** Academiestraat 1, 9000 Gent http://www.thagaste.be/

		Distance from conf. venue
A)	**Ghent Marriott** Korenlei 10, 9000 Gent http://www.marriott.com/hotels/travel/gnemc-ghent-marriott-hotel/	468 meters
B)	**Harmony Hotel** Kraanlei 37, 9000 Gent http://www.hotel-harmony.be/eng/page/hotel	330 meters
C)	**Hotel Gravensteen** Jan Breydelstraat 35, 9000 Gent http://www.gravensteen.be/index.asp?taal=uk	320 meters
D)	**Hotel Cathedral** Sint-Jacobsnieuwstraat 87, 9000 Gent http://www.hotelcathedral.be/en	873 meters
E)	**Hotel De Flandre** Poel 1, 9000 Gent http://www.hoteldeflandre.be/index.asp?taal=uk	512 meters
F)	**Erasmus Hotel** Poel 25, 9000 Gent http://www.erasmushotel.be/en/welcome-to-our-website	561 meters
G)	**Best Western Residence Cour St. George** Hoogpoort 75, 9000 Gent http://www.courstgeorges.be/en/index.php	693 meters
H)	**Monasterium PoortAckere** Oude Houtlei 56, 9000 Gent http://monasterium.be/index.php?taal=eng	776 meters
I)	**Novotel** Goudenleeuwplein 5, 9000 Gent http://www.accorhotels.com/gb/hotel-0840-novotel-gent-centrum/index.shtml	603 meters
J)	**Sandton Grand Hotel Reylof Gent** Hoogstraat 36, 9000 Gent http://www.sandton.eu/en/gent/	608 meters

We look forward to seeing you in Ghent.

Local Organizing Committee

Language

The official language of the conference is English.

Scientific Secretariat

AETE board

REGISTRATION FEES

Ghent, Belgium 2015	Euros
Full/Associate Member **Before** *15th July 2015*	**290 €**
Full/Associate Member **After** *15th July 2015*	**340 €**
Student Member **Before** *15th July 2015*	**140 €**
Student Member **After** *15th July 2015*	**155 €**
2015 Membership Fee ***Members who pay their annual fee but do not attend the Meeting will receive a copy of the proceedings***	**90 €**
2015 Accompanied Person	**120 €**

This price includes:

- membership fee
- participation at the Meeting (two full days)
- two workshops
- published proceedings
- lunch and coffee breaks
- social events

Fees for Sponsoring AETE Meeting

Main Sponsor	**7 500 Euros**
General Sponsor	**4 500 Euros**
Exhibitors	**1 900 Euros**
Supporters	**1 000 Euros**

Costs for advertisement in the Newsletter (2 issues) for one year (mailed to ~700 members)

Full color back page	**800 Euros**
Full inside color page	**600 Euros**
Half inside color page	**400 Euros**

AETE

Association Européenne de Transfert Embryonnaire

European Embryo Transfer Association

31th SCIENTIFIC MEETING

Augustijner Abbey
Ghent
Belgium

P R O G R A M M E

11th and 12th September 2015

THURSDAY, September 10th 2015

14.00-18.00: **Workshop – at the Faculty of Veterinary Medicine - Ghent University**

A week in the life of an equine embryo moderated by Ann van Soom (Belgium)

18.30-20.00: Registration (Augustijnerabdij or Augustinian Monastery, Academiestraat 1, Ghent)

19.00-22.00: Welcome Reception (Augustijnerabdij: tasting local cheeses and beers, cold and hot snacks all made by the Fathers Augustinians)

FRIDAY, September 11th 2015

07.30-09.00: Registration (Augustijnerabdij)

09.00-09.15: Opening meeting by the AETE President **Frank Becker**

SESSION 1 - Chairpersons: DANIEL LeBOURHIS & RAINER SANER

09.15-10.00: First invited lecture:

Roelofs, van Erp-van der Kooij (Netherlands): Estrus detection tools and their applicability in cattle: recent and perspectival situation.

10.00-10.45: POSTER SESSION 1 and coffee break

11.30-12.15: Short oral communications (Embryo collection and transfer)

(1) Reichenbach et al.: Born Simmental calves after the transfer of genetic evaluated Day 7 bovine embryos.

(2) Mikkola and Taponen: Transfer of cattle embryos produced with sex-sorted semen results in impaired pregnancy rate.

(3) Quinton et al.: Using progesterone assay before superovulatory treatment in bovine farms.

12.15-13.30: Lunch

SESSION 2 – Chairpersons: IAN KIPPAX & JO LEROY

13.30-14.15: Second invited lecture:

Chavatte-Palmer, Richard, Peugnet, Robles, Rousseau-Ralliard, Tarrade (France):
The developmental origins of health and disease: Importance for animal production

14.15-15.15: Short oral communications (Student Competition)

(1) Hamdi et al.: Bovine oviduct epithelial cells: an *in vitro* model to study early embryo-maternal communication

(2) Catteeuw et al.: Time-lapse analysis of early cleavage in bovine embryos produced in serum-free medium.

(3) Ferraz et al.: A novel 3-D culture system to study bovine oviduct physiology, gamete interaction and early embryo development.

(4) De Bie et al.: The effects of hypo- and hyperglycemia during lipolysis-like conditions on bovine oocyte maturation, subsequent embryo development and glucose metabolism.

15.15-16.00: POSTER SESSION 2 and coffee break

16.00-17.30: Workshop I:– Equine ART
Moderated by **Katrin Hinrichs (USA)**

19:00 – 24:00: Conference dinner and dance party at Sint Pieters Abbey Crypt (Sint-Pietersplein, Ghent, Belgium).

SATURDAY, September 12th 2015

07.45-09.00: Student breakfast (only after subscription, only open for master, PhD or post doc students co-authoring a presented abstract)

SESSION 3 – Chairpersons: SERGE LACAZE & MARJA MIKKOLA

09.00-09.45: Third invited lecture:
Lewis and Sturmey (Great Britain): Embryo metabolism: what does it really mean?

09.45-10.45: Short oral communications (**In vitro Production**)

(1) Aardema et al.: Fertility effects of performing ovum pick up at young age.

(2) De Monte et al.: 3D visualization of bovine oocyte *in vitro* maturation by confocal laser scanning microscopy.

(3) Lewis et al.: Interpretation of equine *in vitro* produced embryo morphology.

(4) Gamarra et al.: A retrospective study of in vitro embryo production from high genetic merit cows oocytes fertilized with unsorted or X-sorted sperm in a commercial program.

10.45-11.00: Sponsor presentation

11.00-11.30: General Assembly

11.30-12.00: POSTER SESSION 3 and coffee break

12.00-13.15: Lunch

SESSION 4 – Chairpersons: DIMITRIOS RIZOS & PETER VOS

13.15-13.45: Pioneer award 2015:
Michel Thibier AETE Medallist Presentation
introduced by Patrice Humblot (Sweden)

13.45-14.45: Short oral communications (Embryo environment)

(1) Gibson et al.: Intrauterine expression of insulin-like-growth factor family members during early equine pregnancy.

(2) De Ruijter Villani et al.: Effect of asynchronous embryo transfer on glucose transporter expression in equine endometrium.

(3) Ghanem et al.: Mobilization of intracellular lipids by supplementation of IVM and IVC media with L-carnitine improves bovine embryo quality.

(4) López Albors et al.: Periovulatory pH within the porcine oviduct and uterus obtained by laparoendoscopic single-site surgery.

14.45-15.15: Coffee break

15.15-16.45: Workshop II: Non- invasive embryo quality assessment
Moderated by NN

16.45-17.00: Closing session: Student Competition results and invitation to the AETE Conference 2016

18.00: Social event in the Augustijnerabdij
coming together to taste local specialties, drink a nice and strong local beer, dance,

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Pre-conference Workshop: A week in the life of an equine embryo

Practical information
Time: Thursday September 10th, 14-18h, 2015

Concept: Demonstration workshops in groups of 10 early stage researchers / equine practitioners

Maximum number of participants: 30 persons

Venue: Faculty of Veterinary Medicine, Department of Reproduction, Obstetrics and Herd Health, Merelbeke, Belgium.

Transport: The bus to the Faculty will leave at the Augustijnen Monastery, Academiestraat 1, Ghent, at 14.00h. The workshop will start at 14.30h and will be finished at 17.15h. The bus will leave the Faculty at 17.30h and arrival at the Augustijnen Monastery in Ghent is planned at 18.00h.

Scientific programme

14.30h - 14.45h: General introduction - Ann Van Soom
14.45h – 16.15h: Alternating demonstrations in 3 groups of 10 attendants
1. Demonstration of equine oocyte collection *in vivo*
Stefan Deleuze – Katrin Hinrichs – Cyrillus Ververs, Clinic Reproduction, Obstetrics and Herd Health
2. Demonstration of equine and bovine oocyte collection *in vitro*
Catharina De Schauwer –Laboratory Reproductive Biology Unit
3. Demonstration of intracytoplasmic sperm injection
Katrien Smits ICSI Laboratory Reproductive Biology Unit
16. 15h – 16.45h: Coffee break
16.45h – 17.15h: Demonstration of oocyte transfer
Stefan Deleuze – Katrin Hinrichs Clinic Reproduction, Obstetrics and Herd Health

Procedure for REGISTRATION (to be followed):
1. Send an email to jan.govaere@ugent.be to announce participation
2. You will receive a **confirmation** of your registration by e-mail
3. If accepted for attendance perform payment for workshop of **Euro 30,-**

PAYMENT procedure
AETE bank account: Raiffeisenbank Lagern-Baregg Genossenschaft, Agency Birmenstorf, Badenerstrasse 1, 5413 Birmenstorf/CH
IBAN CH74 8074 0000 0073 6117 4, BIC code: BIC: RAIFCH22, Bank Code 80740
Announce: Name and registration preconference AETE 15

E-mail address AETE treasurer for further information: rsa@swissgenetics.ch

As the chair of COST Action EPICONCEPT (see picture above, from left to right Laszlo Tecsi COST Secretary, Trudee Fair Working group Leader, and myself) , I would like to inform you of the aim of our Action and of our upcoming activities.

Our Aim is to bring together researchers of many European countries in order to create a collaboration network which focuses on the epigenome of gametes and embryos at periconception.
We also want to describe the epigenetic modulators and profile during periconception, and develop an epigenomic toolbox. Last but not least we want to inform the public, the livestock breeders and the industry on how the epigenome can be manipulated via the periconception environment.

Our next Meeting will be held on **06-07 October 2015, Hersonissos, Crete, Greece**

You can find more information on our website http://cost-epiconcept.eu/

Sincerely,

Ann Van Soom

BRIDGING
THE GAP BETWEEN
BASIC AND CLINICAL RESEARCH

S A L A A M

As Chair and Co-Chair of COST Action BM1308 “Sharing Advances on Large Animal Models – S A L A A M” it is our pleasure to inform you about the goals and events of our Action which started just a year ago. The translation of novel discoveries from basic research to clinical application is a long, often inefficient and costly process. Consequently, “Translational Medicine” has become a top priority. Appropriate animal models are critical for the success of translational research.

SALAAM will support the development, characterization and implementation of tailored large animal models by (i) sharing information and technology for genetic engineering; (ii) developing criteria for selection of the most suitable species; (iii) establishing and validating standardized phenotyping protocols; (iv) creating a database of existing models, tissue samples, and validated phenotypic assays; and (v) developing concepts for the scientific and ethical evaluation of experiments with large animals.

More information on our past and future activities can be found at www.salaam.genzentrum.lmu.de.

With best regards

Eckhard Wolf
Action Chair

Pascale Chavatte-Palmer
Action Co-Chair

18th International Congress of Animal Reproduction

June 26- 30th 2016, in Tours, France

The cutting edge science…

Beyond the recent developments of reproductive physiology studies and biotechnologies in farmed and wild species, this edition of ICAR will bring up several emerging topics and concepts, including predictive biology, epigenetic regulations, developmental origin of adult health and new insights in neuroendocrinology. Gathering outstanding speakers in the different fields of reproduction research, from basic knowledge acquisition to field application, this conference will provide high quality scientific contents to any attendee.

… In the garden of France

Located in the centre of France, the Loire Valley is a road to history. The majestic Loire river flows peacefully in a bucolic environment punctuated by precious traces of the past. Amongst them, the castles from the Renaissance period (Chambord, Chenonceau,…) became the obvious symbol of this region. Architectural treasures legated from the past, they also bear the history of France and its Kings. Region of traditions, the Loire Valley is a conservatory of French way of life with delicate and tasteful gastronomy and worldwide known wines. All these treasures will be at easy reach to the ICAR participants during the meeting itself and during post conference tours.

The ICAR usually gather 1,000 to 1,200 participants coming from up to 70 countries. The public is composed of scientists, professors, students, practitioners in animal breeding, veterinarians and stakeholders. The general philosophy of the congress is to mix very basic research, especially on recently emerging subjects related to reproduction, applied research on reproductive technologies and technical works. This diversity of the subjects is also the guarantee of the diversity and number of the participants. The congress is divided between plenary sessions, gathering the whole attendance, symposia (four symposia in parallel sessions) on species specific or subject specific areas and workshops (six symposia in parallel sessions) gathering short talks and wide discussion time on focused subjects. In addition to the oral communications, we expect around 400 posters divided between 3 successive sessions located near the exhibition and restoration areas.

18TH INTERNATIONAL CONGRESS OF ANIMAL REPRODUCTION

JUNE 26–30TH 2016

LE VINCI IN TOURS
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