



International Embryo Transfer Society
Parent Committee on Companion Animals,
Non-Domestic & Endangered Species
(CANDES)
Report to the IETS Board of Governors
January 2008

Joint Regulatory (Co-Chairs: Justine O'Brien & Linda Penfold) & Health & Safety (Co-Chairs: Bill Holt & Naida Loskutoff) Subcommittee Meetings

Since our two workshops in 2007 to develop the tools for conducting comparative disease risk assessments on transporting live cattle (Boran) versus semen, Linda Penfold has been communicating regularly with Dr. Bill White of the USDA APHIS facility on Plum Island who participated in the earlier workshop. Linda reports that Bill and their new director are quite keen on taking the research on semen and pathogen transmission to a new level by increasing their testing capabilities. They are planning on testing semen from a minimum of 300 bulls, at least 7 of which will be spiked with foot-and-mouth disease virus, to validate their assays that were originally developed for blood samples. Linda also met with the Chief Veterinary Officer of the USDA, who said they would consider funding the development of these tests. This comes at an important time since semen and embryo importation has somewhat ground to a halt for the time being as the USDA revamps their entire animal import process. At present, we are unable to import into the US any endangered hoofed species (even from Canada), let alone semen. Our goal is to develop and publish the comparative disease risk assessment tools in order to appeal to regulatory officials to make more rational decisions as they develop their official policies.

Joint Research (Co-Chairs: Rebecca Krisher & Monique Paris) & Technology (Co-Chairs: Damien Paris & Gabriela Mastromonaco) Subcommittee Activities

As mentioned in my last report, the Research and Technology Subcommittees have completed a special issue of Reproduction, Fertility and Development entitled: A Perspective on the Role of Emerging Technologies for the Propagation of Companion Animals, Non-Domestic and Endangered Species (Guest Editors: Rebecca L. Krisher and Monique J. Paris): <http://www.publish.csiro.au/nid/44/issue/3368.htm>.

We have been fine-tuning the workshop we would like to have considered as a pre-conference (Saturday) workshop at the 2009 IETS conference in San Diego. Attached is a draft of the workshop program (Appendix 1). If approved by the IETS Board of Governors, the CANDES Committee will refine the program, select speakers, and search for alternative sources of funding besides the registration fees and contribution from the Henry Doorly Zoo. After the final program is confirmed and approved by the Board (January 2008), the program will be sent to the list-serve for the CANDES Committee members as well as published in the Embryo Transfer Newsletter.

Respectfully Submitted,
Naida M. Loskutoff, Chairman of the IETS CANDES Parent Committee

Appendix 1

International Embryo Transfer Society Parent Committee on Companion Animals, Non-Domestic & Endangered Species (CANDES)

Workshop Series: Implementation of established assisted reproductive technology in CANDES

Purpose:

In addition to the publication of a *Reproduction Fertility & Development* special issue on emerging technology currently in progress, we propose to hold workshops to get member input on the role of established reproductive technologies for the propagation of CANDES species. Experts across the taxa will be asked to prepare extended abstracts, deliver presentations and lead discussions. The CANDES Research & Technology Sub-committee Co-chairs will facilitate the development of a consensus position statement highlighting the value of the respective technologies, their limitations, appropriate target species, and priority areas/taxa in which further research is required.

Topic:

For an initial workshop we propose to focus on one of the more fundamental technologies that has increasing success in CANDES species: Artificial Insemination (and endocrinology/spermatology specifically related to achieving successful AI). See proposed scientific program and detailed content below.

Format:

The workshop shall attempt to cover the above topic for a broad range of CANDES species including: birds, reptiles, amphibians and mammals (specifically carnivores, ungulates, non-human primates, marine mammals and marsupials). Within each session the presentation/discussion will focus on:

- (i) Current status of knowledge (development of the technique – early disappointments, successes, accidents and pitfalls; success in domestic and CANDES species).
- (ii) Advantages (applications/benefits for CANDES).
- (iii) Complications (problems with application of technique in any species, but particularly foreseeable issues with CANDES species).
- (iv) Future Research Priorities (basic reproductive knowledge; technological developments; appropriate/inappropriate target species).

The morning will consist of traditional presentations focusing on ancillary approaches (Session 1: Monitoring & Manipulation of Female Reproduction; Session 2: Collection & Preparation of Spermatozoa) required to successfully implement artificial insemination in CANDES. The afternoon will consist of more applied talks/demonstrations/discussions split into two sessions (Session 3: Artificial Insemination Taxon Workshops; Session 4: Consensus Discussion on Research Priorities) to demonstrate current approaches, and identify limitations and priority areas for further research at the taxa level. Posters will be on display throughout the day but presenters will deliver a 3 min rapid poster communication in Session 3 (see proposed scientific program and detailed content below).

Location:

If approved by the Board of Governors, we propose to hold this first workshop as a full day Saturday pre-conference satellite symposium associated with the International Embryo Transfer Society (IETS) Annual Conference in San Diego, California, USA in January 2009. It is important that input is obtained from as many stakeholders as possible in this field to ensure output from the workshops is representative and credible. We will endeavor to ensure research presented is internationally representative and the range of species are well represented, while remaining economically and logistically prudent.

Outcomes:

The intended outcome of this workshop is to develop a consensus position statement highlighting the value of the respective technologies, their limitations, appropriate target species, and priority areas/taxa in which further research is required. It is hoped that the proceedings – papers, discussion points and summaries will be published and it is possible that a multi-author review paper or a journal special issue would be a natural result of this workshop. We are still considering the following:

- (i) The format of the workshop output (proceedings, white paper/position statement, multi-author review paper, working minutes, meeting summary or techniques manual)
- (ii) Means of disseminating the output (scientific journal, SSPs, TAGs, CANDES website, IETS newsletter, funding agencies)

**35th Annual Conference of the International Embryo Transfer Society
January 2009, San Diego, California, USA.**

**Post-conference Satellite Symposium:
“Implementation of Artificial Insemination in CANDES”**

Scientific Program:

- 8:45am Opening remarks and welcome
(CANDES Research & Technology Sub-committee Co-chairs:
Damien Paris & Monique Paris, University of Utrecht, Netherlands; Gabriela
Mastromonaco, University of Guelph, Canada; Rebecca Krisher, Purdue
University, USA)
- 9:00am Session 1: Monitoring & Manipulating Female Reproduction
(i) non-invasive hormone monitoring
Franz Schwarzenberger or Janine Brown
(ii) ovulation induction by exogenous hormones
Morney de la Reye or Naida Loskutoff or JoGayle Howard
(iii) alternative monitoring & ovulation induction strategies (ultrasonography,
behavior, male pairing – pheromones, removal of pouch young –
lactational arrest, etc.)
Cheryl Asa or Thomas Hildebrandt
- 10:30am Coffee Break & Poster Viewing
- 11:00am Session 2: Collection & Preparation of Spermatozoa
(i) collection strategies (source & method)
Bill Swanson or Budha Pukazhenth
(ii) determinants of sperm quality (morphology, motility, number, membrane
integrity, competitive fertilization ability, high quality sub-populations)
Montserrat Gomendio or Bill Holt
(iii) sperm preservation strategies (freezing, prolonged survival in ambient
temperatures)
Stanley Leibo or Budha Pukazhenth **or Linda Penfold**
- 12:30pm Lunch
- 1:30pm Session 3a: Artificial Insemination Taxon Workshops
(Concurrent sessions including poster rapid communications)
(a) Birds/Reptiles/Amphibians (b) Ungulates (c) Marine
Mammals/Marsupials
Juan Blanco **Thomas Hildebrandt** **Justine O'Brien**
J. K. Mattson **Dennis Schmitt** **Damien Paris**
Andy Kouba **Julian Skidmore** **Frank Molina**
Steve Monfort

- 3:00pm Coffee Break & Poster Viewing
- 3:30pm Session 3b: Artificial Insemination Taxon Workshops
(Concurrent sessions including poster rapid communications)
- | | |
|-----------------|-------------------------|
| (a) Carnivores | (b) Primates |
| Wenche Farstad | Naida Loskutoff |
| Jo Gayle Howard | Gabriel Sanchez-Partida |
| Cheryl Asa | |
- 5:00pm Session 4: Consensus Discussion on Research Priorities (Expert Panel – Chaired by CANDES Research & Technology Sub-committee Co-chairs)
- 5:30pm Conclusions

Content:

Session 1. Monitoring & Manipulating Female Reproduction: This session will be delivered in a traditional lecture style format of 30 min duration each (incl. 5 min discussion). It will focus on the importance of determining the time of ovulation in females for successful outcomes in artificial insemination in CANDES. It will concentrate on traditional hormone monitoring and manipulation of female reproduction by exogenous hormone regimes, but also explore alternative monitoring & manipulation strategies that may be appropriate for a number of species. Specific areas may include: sample collection (feces, urine, saliva, milk); non-invasive endocrine monitoring techniques/assays (RIA, EIA); hormone profiles; other monitoring techniques (ultrasonography, behavior, etc.); ovulation induction by hormone treatment (regimes, species specificity, induction, synchronization/down regulation, and superovulation); other ovulation induction techniques (pheromonal induction by pairing with male; synchronization by removing lactational stimulus, etc.).

Potential experts:

- Janine Brown, National Zoo, USA (hormone monitoring – elephants & cats)
- Steve Monfort, National Zoo, USA (hormone monitoring & induction – deer & antelope)
- Katey Pelican/Rose Bauer, National Zoo, USA (hormone induction – cats)
- Helen Bateman, Cincinnati Zoo, USA (otters)
- Norman Rawlings, University of Saskatoon, Canada (hormone monitoring – bison, etc).
- Terri Roth, Cincinnati Zoo, USA (hormone monitoring – amphibians, reptiles)
- Franz Schwarzenberger/Erich Möstl/Rupert Palmer, University of Veterinary Medicine, Austria (hormone monitoring – CANDES)
- Frank Molinia, Landcare Research, New Zealand (hormone induction – marsupials)
- Lyn Hinds, CSIRO, Australia (hormone monitoring & induction – marsupials)
- Monique Paris (hormone induction – marsupials)
- Thomas Hildebrandt, IZW, Germany (ultrasound monitoring – CANDES)
- Other: Duane Kraemer (Texas A&M University); Cheryl Niemuller (Toronto Zoo, Canada); Nancy Czekala (San Diego Zoo, USA); SK Wasser/M Dehnhard (IZW, Germany); Nadja Wielebnowski (Brookfield Zoo, USA).

Session 2: Collection & Preparation of Spermatozoa: This session will be delivered in a traditional lecture style format of 30 min duration each (incl. 5 min discussion). It will focus on the collection, evaluation and preparation of spermatozoa required for artificial insemination in CANDES. Specific areas may include: source (ejaculated, epididymal) and method of collection (AV, EEJ, manual donation, biopsy); traditional and emerging determinants of sperm quality (morphology, motility, number, membrane integrity, competitive fertilization ability, high quality sub-populations); preservation strategies (cryopreservation, membrane integrity & cryodamage, prolonged survival in ambient temperatures in the presence of oviductal proteins).

Potential Experts:

- *David Taggart, University of Adelaide (collection & cryopreservation – marsupials)*
- *Bill Holt, IoZ, UK (sperm quality & ambient/cryopreservation – CANDES)*
- *Juan Blanco, CERI, Spain (collection & cryopreservation – raptors)*
- *Linda Penfold, White Oak, USA (collection – birds, antelope)*
- *Budha Pukazhenth, National Zoo, USA (collection & cryopreservation – carnivores)*
- *Justine O'Brien, University of Sydney, Australia (sex-sorting & cryopreservation – birds, marine mammals)*
- *Bart Gadella, University of Utrecht, The Netherlands (sperm membranes, capacitation & flow cytometry - domestics)*
- *Monica Stoops, Cincinnati Zoo, USA (rhinos)*
- *Andy Kouba, Memphis Zoo, USA (amphibians)*
- *Rebecca Spindler, Taronga Zoo, Australia (pandas, cats)*
- *M. Tourmente, Argentina (snakes)*
- *Others: Genevieve Magarey (Cincinnati Zoo); Julio de la Fuente (Spain); Bill Swanson (Cincinnati Zoo); Theresa Abaigar (Spain).*

Session 3: Artificial Insemination Taxon Workshops (Concurrent sessions): These will be delivered as two concurrent sessions grouped by taxon and will consist of more applied talks/discussions led by 2 or 3 experts within each taxon. The format may include explanations, demonstrations or videos of techniques and a consensus discussion to identify priority areas/species for further research. We plan to have posters on display throughout the day (grouped by taxon) however, during the concurrent sessions poster presenters will be given 3 min to summarize their poster to each taxon group. Specific areas in artificial insemination may include: method (surgical, non-surgical); anatomical considerations & insemination site (vaginal, uterine); timing (pre or post ovulation). Specific areas for the consensus discussion may include: current limitations, priority research areas (basic reproductive biology/physiology, technology development, taxa/species).

Potential Experts:

- *Thomas Hildebrandt/Robert Hermes/Frank Goeritz, IZW, Germany (elephants, rhino)*
- *Dennis Schmitt, Southwest Missouri State University, USA (elephants)*
- *Monica Stoops, Cincinnati Zoo, USA (rhino)*
- *Jo-Gayle Howard, National Zoo, USA (cats, ferrets, pandas)*

- *Wenche Farstad/Ragnar Thomassen, Norwegian School of Veterinary Science, Norway (canids)*
- *Naida Loskutoff, Omaha Zoo, USA (gorillas)*
- *Damien Paris, University of Utrecht, The Netherlands (marsupials)*
- *Frank Molinia, Landcare Research, New Zealand (marsupials)*
- *Steve Johnston, University of Queensland, Australia (marsupials)*
- *Justine O'Brien, University of Sydney, Australia (marine mammals?)*
- *Juan Blanco, CERI, Spain (raptors)*
- *Graham Wishart, Dundee Abertay University, UK (Houbara bustards)*
- *Others: D. Zambelli (Italy), Nei Moreira (Brazil), Henry Jabbour (Edinburgh, UK), Barb Wolfe (USA), Debbie Berg (New Zealand – ungulates/deer), Cheryl Asa (USA - canids/felids).*

Session 4: Consensus Discussion on Research Priorities: This session will consist of an open discussion in the presence of an expert panel (consisting of invited speakers) and mediated by the CANDES co-chairs. It will focus on discussing and compiling opinions on research priorities for the different taxa developed during session 3. The intended outcome of this workshop is to develop a consensus position statement highlighting the value of the respective technologies, their limitations, appropriate target species, and priority areas/taxa in which further research is required.