17th International Congress on Animal Reproduction
“Celebrating the Past and Embracing the Future”
Vancouver, British Columbia, Canada

Thanks to
IETS Travel Grant ICAR 2012
Why I applied

• My research:
  - Evaluation of frozen boar sperm using in vitro assays
    1. IVF
    2. Oviduct Binding
    3. Zona Binding
Symposia I Attended

- Oocyte and Embryo Health
- A New Understanding of Sperm Development and Function
- Cryopreservation of Gametes, Embryos, Organs and Tissues
- Applied Research in Male Reproduction
Workshops I Attended

• In Vitro Embryo Production
  – Osamu Dochi, Rakuno Gakuen; University, Japan
    ❖ Fertilization rates among bulls are different and similar to boar data collected from my research

• Biostatistics
  – George Seidel Jr., Colorado State University,
    ❖ Competitive fertilization, and Receiver Operating Curves

• Diagnostic Tools for Gametes and Embryos
  – Don Rieger, LifeGlobal, Canada
    ❖ HA Binding assays and high resolution morphological assessment of sperm and vacuoles
      ❖ IMSI and PICSI
Symposium 11: Applied Research in Male Reproduction

- Xavier Druart, INRA, France
  - Interaction of spermatozoa with the female reproductive tract

  ➢ Cell-Vizio: in vivo imaging of sperm using octadecyl-rhodamine that covers the whole sperm surface
  ➢ KO of proteins interfere with sperm transportation in the female tract
  ➢ B defensin 126 is rich in sialic acid and gives sperm a negative charge
  ➢ Best sperm in the ejaculate are those with a high negative charge given by sialic acid
Symposium 5: Cryopreservation of Gametes, Embryos, Organs and Tissues

- Amir Arav: Institute of Animal Science, Israel
  Directional freezing and other innovative methods for sperm, ovarian tissue and organ cryopreservation

- Change the velocity of the temperature gradient to control ice crystal formation: Similar to MDS
- Need high velocity with small ice crystals and a large space between crystals
- Large volume freezing changes release of latent heat
  - Heat gets transferred from a small area because cells are frozen in slices instead of heat released into what has already been frozen
- Double freezing of bull sperm with no affect on fertility and conception
- Concentrating on freezing without cryoprotectants
Symposium 11: Applied Research in Male Reproduction

- Massimo Faustini
  - *Enhancing performance insemination through controlled release of spermatozoa in pigs*

- Sperm are encapsulated in a biodegradable alginate polymer
  - Releases sperm over time, and passage of molecules

- Slow, constant release of sperm

- Boar sperm had normal acrosomes but poor motility
  - $\text{Ba}^{2+}$ replaced $\text{Ca}^{2+}$

- Fertility is still low
Symposium 3: Oocyte and Embryo Health

• Marc-Andre Sirard-Laval University, Canada
  – Factors affecting the oocyte and embryo transcriptomes

  ➢ RNA is important in oocytes
  ➢ RNA translated during fertilization are the most limiting as far as development is concerned

    ➢ i.e. PTTG1 is increased in dividing 2 cell embryos
    ➢ i.e. cyclin B required for early cell divisions before genome takes over: Are their protein factors that disrupt cyclin B?

  ➢ Gene of interest CDK-1: involved in spindle stability
Symposium 3: Oocyte and Embryo Health

- Some RNAs are added at the end of follicular development
- miRNAs may be controlling the fate of early embryos
  - i.e. miR-21 (a maternal RNA): destroys maternal RNA to allow embryonic activation
- My interests: sperm-borne miRNAs
“Networking”
Old Friends and New Friends
Thank You IETS!

Brad Daigneault
University of Illinois