

FAANG-related Project Updates - Canadian efforts

**Eveline Ibeagha-Awemu (AAFC, Sherbrooke),
Angela Canovas (U of Guelph),
Graham Plastow (UofAlberta)**



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada



**CRSNG
NSERC**

2014-2018. Title: Genomic factors of resistance to bovine paratuberculosis (Johne's disease)

Project leaders: N. Bissonnette (AAFC, Sherbrooke); Project co-leader: J. Meadus (AAFC, Lacombe)

Collaborators: **E.M. Ibeagha-Awemu** (AAFC, Sherbrooke, P. Griebel (Uni. Saskatchewan), L. Guan (Uni. Alberta), F. Miglior (Canadian Dairy Network and Uni Guelph)

Funding source: Agriculture and Agri-Food Canada

Total funding 1.2M

Work accomplished:

- Tissue samples collected from different sections of the gastrointestinal tract of sick animals (n=10) and healthy animals (n=10)
- Characterization of microRNA and long non-coding RNA expression
 - Sequencing on an Illumina HiSeq 2500 system completed for lncRNA
 - Sequencing of mRNA libraries is in progress
 - Bioinformatics analysis is pending

Planned work:

- Characterization of circularRNA
- Functional validation of roles of miRNA, lncRNA and cirRNA in Johne's disease



Beef and Dairy Cattle



Project Title:

Improving selection efficiency by combining functional studies and a systems biology approach with the estimation of breeding values in cattle



Funding:



- PI: Angela Cánovas (University of Guelph) with Graham Plastow (University of Alberta) and others)
- **Collaboration with the lead groups in the FAANG consortium** (University of California-Davis)
- **Assays:** **RNA-Seq** (different breeds, tissues & biological stages)
DNA-Methylation
Whole Genome Sequencing and 16S & 18S Sequencing

Beef Cattle



Project Title:

Use of –omics technologies toward profitability and consumers’ satisfaction

Funding:



• PIs: Angela Cánovas (University of Guelph) & Graham Plastow (University of Alberta)

• **Assays:** **RNA-Seq** (n=40)

Tissues: Muscle (*Longissimus Dorsi*) and Fat tissues

Groups: High and Low Tenderness (WB shear force)

Sheep



Project Title:

Leveraging -OMICS and systems biology to understanding the genes and metabolic pathways associated with genetic resistance to parasites in sheep

Funding:



PI: Angela Cánovas (University of Guelph)

• **Collaboration with the lead groups in the FAANG consortium** (University of California-Davis)

• **Assays: RNA-Seq** (n=70)

Abomasum tissue

Groups: High and Low Immunity and Stress Responders

Beef Cattle



Project Title:

Genetic variations associated with feed efficiency and methane yield

Funding



- PIs: Graham Plastow (University of Alberta) with Angela Canovas (University of Guelph) and others
- **Collaboration with the lead groups in the FAANG consortium inc.**
University of California-Davis
- **Samples:** Hi/Lo for traits; 4 time points (pre-weaning, weaning, market weight/post-puberty, mature (4-5yr); 2 males and 2 females, approx. 20 tissues (tbd)
- **Assays:** RNA-seq, ChIP-seq, ATAC-seq, others

Other Projects



Genome Canada Large Scale Applied Research Projects



Dairy Cattle and feed efficiency – PIs Filippo Miglior (Canadian Dairy Network/U of Guelph) and Paul Stothard (U of Alberta)

Pig Disease Resilience – PIs Mike Dyck, John Harding (U of Saskatchewan), Bob Kemp (PigGen Canada)

- **Collaboration with the lead groups in the FAANG consortium inc.**
Roslin Institute, ISU.....
- **Assays:** Primarily RNA-seq, but **opportunities for additional sampling** for FAANG phase 2 or new collaborations
Including new Genome Canada competition opening June 2018