



ISAG CONFERENCE 2012, Cairns, Australia

Domestic Animal Epigenetics

STANDING COMMITTEES / WORKSHOPS Information will be posted online

Organised by a standing committee **yes** **no X** (At the planning stage there was no formal ISAG endorsed Standing Committee. The workshop was planned by an ad hoc committee.)

Date and meeting time: Thursday July 19, 9 am- 12-30 pm

Chair, name and contact email: Ross Tellam, ross.tellam@csiro.au

Agenda / programme attached

ISAG 2012 Domestic Animal Epigenetics Workshop

Chairperson Ross Tellam
THURSDAY

Time	Speaker	Title
9:00-9:30	Ruidong Xiang	Maternal and paternal genetics differentially affect myofibre characteristics and muscle weights of bovine fetuses at midgestation
9:30-10:00	Martin Braunschweig	Is RNA involved in transgenerational epigenetic inheritance?
10:00-10:30	Ross Tellam	Histone deacetylase 9 is a negative regulator of myogenesis
10:30-11:00	Coffee Break	
11:00-11:20	Yu Jiang	The imprintome of a domestic sheep
11:20-11:40	Laure Fresard (France)	Transcriptome-wide investigation of genomic imprinting in chicken
11:40-12.00	Wei Wei	Identification of novel miRNAs and pathway in myoblast differentiation
12:15 Business meeting		
12:30 close		

Appendix 1

International Society for Animal Genetics

Proposal for a Standing Committee for Domestic Animal Epigenetics

Committee Responsibilities, Officers and Terms of Service

Science Background

Epigenetics is the biological process that brings the genome to life. It is defined as the study of heritable changes in gene function that occur without change in the sequence of DNA.

Epigenetics impacts all animal biology including development, reproduction, responses to environmental stimuli, cellular ontology and cell positioning. Epigenetics can define past, present and in some cases future gene activity. In this latter context there is increasing evidence that early life environmental stimuli can result in altered animal phenotypes later in life and that this process is mediated by epigenetic reprogramming. Moreover, there is also emerging evidence for small and transient transgenerational epigenetic effects that have wide implications for population genetics. The ‘heritability’ associated with epigenetics is thus primarily associated with mitotic transmission but increasingly there is also focus on meiotic transmission.

Variation lies at the heart of population genetics. Selective breeding of domestic animals exploits this variation to enrich for production traits that are useful to humans. For many production species this process has been markedly accelerated through the use of DNA-based genetic information, particular dense SNP chips. These studies largely fail to account for all of the heritability for a complex trait. One likely possibility is that transmitted epigenetic variation may account for some of this ‘lost’ heritability. Moreover, it is likely that specific highly conserved genomic loci are associated with stochastic epigenetic variation. This type of variation may strongly increase the ‘fitness’ of wild populations subject to selective pressures and may need to be considered in domestic animal genetics investigations. Genetic variations in these regions may not change the average phenotype in a population but change the variability of the phenotype. Thus, population genetics investigations incorporating these epigenetic concepts may have strong implications for domestic animal production.

Technology

Recent technological developments in DNA sequencing coupled with the availability of new antibody and enzyme resources are driving the ability to measure epigenetic responses and epigenetic variation within populations. The human ENCODE project highlights the amazing information content of the epigenetic code, the technology approaches that can be undertaken, and the standards required for various analyses. The ENCODE project has also clearly linked chromatin structure with genetic variations contributing to complex traits and thus comparable approaches may benefit domestic animal genetics investigations.

The Standing Committee

To make the operations of this Standing Committee transparent to all, the guidelines for the general responsibilities of the committee, as well as special responsibilities of the officers, and the terms of service are defined here. The members of the Standing Committee can amend these guidelines at any time, by majority vote. The members of the Standing Committee should be updated after each conference. Should ISAG implement general guidelines for all Standing Committees, then the ISAG guidelines will replace the relevant committee guidelines.

Aims of the Standing Committee

1. Organise and promote the Domestic Animal Epigenetics Workshop at ISAG conferences. The workshop will be topical and include a broad representation of speakers decided by the Committee. The Committee may also provide advice and assistance to the organisers of the ISAG conference.
2. As required make recommendations on standards and resources for epigenetic profiling of domestic animals.
3. Promote integration of epigenetics science with population genetics research
4. Foster the development of early career scientists in the field of epigenetics

Membership of the Standing Committee

Members of the Committee will be nominated (including self-nomination) from the floor at the workshop. The committee will ideally provide broad geographic, research species, and career-stage diversity. The number of members on the committee should be between 3 and 5. To ensure participation of a large number of ISAG members over time, members should normally be limited to a four-year term of service, before sitting out a term of at least two years before serving again. The term exceptions are the following two. The past Chairperson should remain on the committee, in an *ex officio* capacity, to advise and assist with continuity of activities. The Vice-Chair advances to Chair and past Chair positions. The number of new members will be adjusted to accommodate the extended terms of officers, as needed, to keep the Committee size between 3 and 5 persons.

Chair of the Committee

The Chair of the Committee will be selected from among its members by the participants at the workshop. The responsibilities of the Chair will be to serve as the Committee's contact person with the Society, to submit the report of the Workshop to the ISAG Secretary, to coordinate the Committee's planning of the workshop, and to moderate the workshop.

Vice-Chair of the Committee

The Vice-Chair of the Committee will be selected by the Committee from among its members, after the workshop. The responsibilities of the Vice-Chair will be to serve as the recording secretary at the ISAG workshop and business meeting of the Standing Committee, to forward the report on the workshop and business meeting to the Committee Chair, and to fulfill the role of the Chair, if the Chair is unable to do so. After a two-year term as Vice-Chair, the Vice-Chair moves to the role of Chair.

Proposers

Hasan Khatib (University of Wisconsin)

Ross Tellam (CSIRO)