NEWSLETTER

EADGENE

European Animal Disease Genomics Network of Excellence for Animal Health and Food

July 2009

EDITORIAL

This is the fifteenth EADGENE Newsletter.

We have articles about:

- EADGENE SABRE Industry Days 2009
- EADGENE Days 2009
- EM-ABG Master
- Sequencing the Bovine Genome

Guro Boman is our "in the Picture" guest.

Marjolein Neuteboom
Esther Lichtenberg

EADGENE and SABRE Industry Days

3rd and 4th June 2009, Rome, Italy

The second EADGENE and SABRE Industry Days were held at the FAO Office in Rome on the 3rd and 4th of June 2009. Now that we are approaching the end of the EADGENE and SABRE projects, we once again organised this special event. The Industry Days of 2009 had four different topics being; 'Role of new technologies for industry', 'The role of diseases', 'Upcoming and running European projects' and 'Ontology – what do we need it for'. The goal of the Industry Days was to further encourage the integration of research and industry, and to highlight outcomes of both projects that are of interest to the industry.

The Industry Days of 2009 started with an overall introduction to the EADGENE and SABRE projects by Anne-Marie Neeteson (European Forum of Farm Animal Breeders). This presentation gave a quick overview on the EADGENE and SABRE projects with the upcoming activities of both projects.

Hyperlinks

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The 'Role of New Technologies for Industry' was introduced by Gerard Albers (Hendrix-Genetics). In his presentation the necessity of access to new technologies and collaboration between industry and academia came forward. Richard Crooijmans (Wageningen University) presented 'Genomic update: analysis of variation', on how far we are in sequencing the genomes of farm animals. Marco Cappelletti (Illumina) presented the current status and the still ongoing improvement of analysing techniques. John Voskamp (Wageningen University) presented the SABRE software tool MiXBLUP, that can be used to estimate the genetic potential of animals. The second session on 'The Role of Diseases' was introduced by Margareta Håård (VikingGenetics) who gave an overview of the impact of diseases for the industry. Roland Aumüller (GLOBALGAP) continued with the current state and possibilities for Animal Health Data Comparison across countries. In "Pathogen genomics - gut health" Pete Kaiser (Institute for Animal Health) explained what the current pathogen genome sequences enable us to do, and what possibilities will be opened up by the new generation of sequencing technologies. Gilles Foucras (INRA) presented the results and meta-analysis on various mastitis initiatives of the EADGENE partners, updating us on the developments in EADGENE's mastitis research .

The participants enjoyed a dinner on the first evening at the Royal Art Cafe, which had a nice view on the Colosseum. It was a good networking opportunity for the academics and people from the industry.

On the 4th of June the day started with the third session, an introduction on 'Upcoming and Running European projects' by Anne-Marie Neeteson (European Forum of Farm Animal Breeders). After this introduction three presentations were given on recently EC funded projects and one on two current poultry projects of EADGENE. Han Mulder (Wageningen University) introduced the EU project RobustMilk in which the objective is to produce an innovative and practical breeding tool for improved dairy products from more robust dairy cows. Allessandro Bagnato (University of Milan) gave an overview of the recently started research project Quantomics (From Sequence to Consequence - Tools for the Exploitation of Livestock Genome). Olivier Demeure (INRA) gave an update on two poultry projects of the EADGENE industry cluster. The first update was on the

Project 'Epistasis effects for resistance to disease traits in chicken', the second 'Search for SNP markers associated with resistance to Salmonella'. Lynn Frewer (Wageningen University) explained the set up and aims of the PEGASUS project on the pros and cons of genetically modified animals.

The Industry days of 2009 finished with the theme 'Ontology' introduced by Pieter Knap (Genus/PIC). He introduced this subject 'Animal Trait Ontology, what do we need it for?' Ina Hulsegge (Wageningen University) gave a more detailed explanation of ontology and on her project on animal trait ontology. Hein van der Steen (StoneBridge Breeding Ltd) finalised the Industry Days. His presentation 'ATO: Overview and Developments' gave an overview on the current animal trait ontology and future aspects.

The EADGENE SABRE Industry Days of 2009 were a success, with about 50 participants from both industry and research coming from eleven countries, which resulted in a good exchange of information between the industry and academics. More information and all the presentations of this event are available on the EADGENE website www.eadgene.info > Events > Industry days 2009.

EADGENE Days 2009

Muséum National d'Histoire Naturelle, Paris, France

The fifth and final EADGENE annual conference on Animal genomics Research will take place on 13th-15th October 2009. This venue is particularly appropriate for an animal genomics conference as 2009 is the 200th anniversary of Charles Darwin's birth, and it is also the 150th anniversary of the publication of his enormously influential book, "On the Origin of Species."

The main 2-day conference will feature a series of talks on the latest genetics and genomics research and technologies by keynote speakers and leading specialists in their fields, presentations on the results of the EADGENE project, and there will be a particular emphasis on the future of animal health genomics. The conference will be followed by two 1-day satellite workshops on mastitis and on animal health data comparison. More information

European Master in Animal Breeding and Genetics

The integrated European Master of Science Course in Animal Breeding and Genetics (EM-ABG) is an international course which aims to offer high quality international training. The course started in 2007 and has since had more than 20 students each year. The EM-ABG course consists of a two-year MSc programme which starts with an orientation period in Wageningen. Subsequently, a major part of the training will be followed at two of the participating universities of the student's choice which offers the opportunity to have access to a broad range of subjects. Graduates will be able to contribute to the development of sustainable animal breeding, in and outside Europe, in a national branch in their country or an international breeding organisation.

The six participating universities are:

- Wageningen University (WU), The Netherlands as coordinator
- University of Natural Resources and Applied Life Sciences (BOKU), Vienna, Austria
- Christian-Albrechts-Universität (CAU), Kiel, Germany
- AgroParisTech (Paris Institute of Technology for Life, Food and Environmental Sciences), Paris, France
- Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden
- The Norwegian University of Life Sciences (UMB), Aas, Norway

The partner universities together form a consortium with a high level of expertise in every core subject in animal breeding and genetics through which EU can provide leadership for the development of a global training program. Moreover, representatives of seven international organisations have joined the International Advisory Board which advices the Consortium on the development of the course.

The EM-ABG course concentrates on use of quantitative and molecular genetics for animal breeding purposes.
This involves the following concepts:

- understanding of and measuring genetic variation (Statistical Genetics)
- molecular genetics and bioinformatics (Genomics)
- design and evaluation of breeding programmes (Animal Breeding)
- understanding of intra-animal biological relationships (other)

Integrating education in a joint course offers the students a better opportunity to specialize in a certain aspect, as well as to have access to a broad range of subjects, bringing about a holistic view on the sustainable use of animal genetic resources. The course is highly relevant for both EU and non-EU students who wish to be employed in organisations working in the field of sustainable animal breeding.

In June 2009, the first group of 23 EM-ABG students graduated and received MSc-diplomas from both host universities where they spent a year of the program. Right after their graduation, more than half of this group was already employed in various international areas of research, education and other branches of animal breeding and genetics.
The first group of EM-ABG students at the graduation ceremony in Vienna, Austria, on June 26, 2009.

For more information on the European Master in Animal Breeding and Genetics: www.emabg.eu. For contact: emabg@wur.nl. Coordinator: Prof. J.A.M. van Arendonk, Animal Breeding and Genomics Centre, Wageningen University.

In the picture:

Guro Margrethe Boman

I was born in 1980 in the town of Arendal on the southern coast of Norway. I guess growing up with biologist parents leaves its mark… As a child I tried to teach the other kids in kindergarten the Latin names of flowers, and took a great interest in studying all the creepy-crawlies I found.

I studied biotechnology at the Norwegian University of Life Sciences. I did my master's at Rikshospitalet University Hospital in Oslo, focusing on expression dynamics of human Cytomegalovirus encoded genes and proteins.

Currently I am working towards a PhD at the Norwegian School of Veterinary Science. I work on bovine mastitis, focusing on gene expression changes in the immune system, supervised by Ingrid Olsaker. The mastitis research group within my institution is small, so I am very happy to be part of the EADGENE mastitis network, benefiting from the knowledge of experienced scientists. I also did an EADGENE funded short term stay in Edinburgh.

I live with my partner in a house a bit south of Oslo, with our rather frisky cat. In my spare time, at least I like to think that I still have spare time, I play the flute in a local wind orchestra.

My plans for the summer are mostly about working, but I hope to find time to relax with a book, going hiking in the mountains, and to go sailing. At this time of the year I thrive in my garden, trying my best to keep the flowers/weeds ratio at an acceptable level. I highly recommend all cat owners to grow catnip - for entertainment purposes!

Sequencing the Bovine Genome

Science paper: "The genome sequence of taurine cattle: a window to ruminant biology & evolution"

By Kirsty Jensen, The Roslin Institute and R(D)SVS, University of Edinburgh

There are estimated to be over 1.3 billion cattle in the world, providing nutrition and livelihood for the majority of the world's population. Cattle are therefore, arguably, the most important mammalian livestock species in the world and the obvious choice to be the first mammalian livestock species to have its complete genome sequenced. The project was undertaken by the Bovine Genome Sequencing and Analysis Consortium and has involved over 300 scientists from 25 countries. The culmination of this project, which took over five years and cost US$53 million, was the reporting of the 7x coverage of the genome of an inbred, female Hereford cow named L1 Dominette in the journal Science on 24th April 2009.

The bovine genome is predicted to contain at least 22,000 protein-encoding genes. Over 4,000 of these predicted genes have been manually annotated, largely by volunteers from the scientific community. Over 400 of these genes were annotated during the Bovine Annotation Jamboree at The Wellcome Trust Sanger Centre, Hinxton in May 2007, which was part funded by EADGENE. The jamboree was attended by several scientists from EADGENE partner institutes, including; The Roslin Institute, Parco Tecnologico Padano and the Norwegian School of Veterinary Science.

The analysis of the bovine genome has significantly increased our knowledge of cattle biology. Comparison with other genome sequences has revealed that the bovine genome contains duplicated regions which may affect several important aspects of cattle biology, e.g. metabolism and immune response. This may help to explain how cattle efficiently convert low-quality food into energy-rich milk and meat. It is hoped that this information will advance studies in cattle, paving the way to new research avenues and aid in the selection of more productive animals.