

US PIG GENOME COORDINATION PROGRAM ACTIVITIES

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Max F. Rothschild, US Pig Genome Coordinator

Overview: Coordination of Pig Genome Coordination Program is under the National Animal Genome Research Program (NAGRP) and is the effort of personnel at Iowa State University (ISU). Support is allocated from NRSP-8 and provided to the Agriculture Experiment Stations by off the top funding. The NAGRP is made up of the membership of the Animal Genome Technical Committee, including the Pig Species Subcommittee.

Facilities and personnel: Max Rothschild, Department of Animal Science, ISU, serves as Coordinator and was reappointed in 2008. Iowa State University faculty and staff help support the national pig genome coordination effort as part of Iowa State University's contribution.

NRSP8 Objectives: **Objective 1:** Create shared genomic tools and reagents and sequence information to enhance the understanding and discovery of genetic mechanisms affecting traits of interest. **Objective 2:** Facilitate the development and sharing of animal populations and the collection and analysis of new, unique and interesting phenotypes and **Objective 3:** Develop, integrate and implement bioinformatics resources to support the discovery of genetic mechanisms that underlie traits of interest.

Map Development Update: New gene markers were identified with the development of the 60K SNP chip. The 60KSNP chip information can now be integrated with the development of Build 10.2f as maps now are based on the pig sequencing efforts.

QTL, Candidate Genes and Trait Associations: QTL and trait associations have continued to be reported on all chromosomes for many traits. Candidate gene analyses have proven successful with several gene tests being used in the industry for many traits including, fat, feed intake, growth, meat quality, litter size and coat color. The PigQTLdb (<http://www.animalgenome.org/QTLdb/pig>) is an excellent repository for all of these results. New genome wide association studies (GWAS) are being published in the pigs.

Sequencing Efforts: The Swine Genome Sequencing Consortium (SGSC) continued its efforts this past year and considerable advances have been made. The "marker" paper has been published in which the Consortium sets out its plans for the analysis and publication of a draft pig genome sequence. Please see *BMC Genomics* 2010, **11**:438 (<http://www.biomedcentral.com/1471-2164/11/438>). Sequencing efforts by the SGSC continue with build 10.2f being released. There are two preliminary annotation resources for the swine genome. The first is work conducted by Henrik Hornshøj Jensen. This annotation can be obtained at the following site http://gbi.agrsci.dk/pig/sscrofa10_2_annotation/. The second, is work developed by the Ensembl team and is http://pre.ensembl.org/Sus_scrofa/Info/Index. Please keep in mind that these efforts are part of the Swine Genome Sequencing Project and all rules and rights of community sequencing projects apply. In addition, this annotation can be visualized in Gbrowse against version 10.2 of the swine genome at <http://www.animalgenome.org/cgi-bin/gbrowse/pig10>.

Database Activities: The Pig Genome Database continues to receive considerable updating. News and updates were set up to report the genome sequencing progress (<http://www.animalgenome.org/pigs/genomesequence/>). New QTL continue to be curated into the Pig QTL Database. The database is available at <http://www.animalgenome.org/QTLdb/pig>. Efforts are being made to align the current genome assembly against pig QTL among other genome features (<http://www.animalgenome.org/gbrowse/>). Database activities were transferred to the Bioinformatics Coordinator.

Shared Materials and Funding: The Pig Genome Coordinator has recently supported community activities to find associations with many different traits and has provided nearly 1600 chips/genotyping for those several projects from 2009-2011. The coordinator is looking for new projects help support by providing SNP genotyping.

Porcine SNP chip update: Illumina and the International Porcine SNP Chip Consortium developed a porcine 60K+ SNP and has shipped it to many researchers worldwide. Researchers that did not place an order can contact Illumina for further information or questions at <http://www.illumina.com/contactMe.ilmn?CS=1>. The original publication was Ramos et al. 2009. Prices for the chip have been dropping.

International Efforts: Communication with all international groups and individuals is excellent.

Communication: The bimonthly *Pig Genome Update* has now published 110 issues and has been distributed electronically to over 2000 people worldwide.

Travel and Meeting Support: Some conferences have received support funding from the Coordinator. Travel of some scientists was partially funded to attend important pig gene mapping meetings.

Future Activities: The goals are to help support all of the objectives of this project. Major activities include helping facilitate and sharing use of the 60K SNP chip and in 2012. Further development of shared populations is ongoing. New bioinformatic tools will also be developed with help of the bioinformatics team. Constructive suggestions from researchers to help this coordination and facilitation program grow and succeed are appreciated.