



# Pig Genome Update

## No. 72 May 1, 2005

**Pig genome sequencing is moving forward.** Thanks go to the USDA's Cooperative State Research, Extension, and Education Service (CSREES) who issued a request for applications (RFA) to sequence the swine genome. In January, Dr. Joseph Jen, Undersecretary for Research, Education, and Economics and Dr. Anna Palmisano, Director of Competitive Programs, announced their intention to issue the RFA at a meeting of the International Swine Genome Sequencing Consortium (SGSC) that was held during the Plant and Animal Genome XIII Conference. Department officials have indicated that they expect a highly competitive, peer-reviewed process. The \$10 million included in the CSREES RFA is not necessarily the bottom line of the USDA's commitment. The Agricultural Research Service of the USDA has indicated that they would provide an additional \$1-2 million for the project. The Alliance for Animal Genome Research, the nonprofit organization that has led the fundraising efforts, praised USDA for outstanding leadership in getting the project underway. The USDA announcement was made possible because of the significant research collaborations of members of the international Swine Genome Sequencing Consortium. Many members of the SGSC have contributed to the development of the resources that will serve as the basis for sequencing the swine genome. This new USDA program will not be the only source of funding for the project. Through the SGSC, the ARS-USDA, the Institute for Pig Genetics of the Netherlands, the INRA of France, Iowa Pork Producers Association, Iowa State University, the National Livestock Research Institute of Korea, the National Research Initiative (NRI) of CSREES-USDA, the National Pork Board, North Carolina Pork Board, North Carolina State University, the Roslin Institute, the Sino-Danish Consortium, University of Illinois, and the Wellcome Trust Sanger Institute have contributed already or have pledged significant support to the swine genome sequencing project. Information regarding the CSREES RFA can be found <http://www.csrees.usda.gov/fo/porcinegenomesequencingnri.html>.

**Swine Oligo Array Committee makes progress.** The swine NRSP8 genome committee has started planning the next generation of swine long-oligo arrays. The Swine Oligo Array committee includes: Scott Fahrenkrug, UMN, Chair; Joan Lunney, USDA BARC, CoChair; Cathy Ernst, MSU; Chris Elsik, TAMU; Jim Reecy, IA State, NRSP8 Bioinformatics Chair; Max Rothschild, IA State, Swine Genome Coordinator, and Joe Cassady, NCSU, Swine NRSP8 Chair. The swine group will develop the non-redundant sets of sequences on which to base oligo design, and expects that a set of ~20,000 long oligos to be produced. To decrease costs the swine group is coordinating efforts with members of the bovine oligo planning group. Committee conference calls were held on Feb. 9, Mar. 9, and Apr. 18. For swine sequences to be included in cluster analyses the Genbank submission deadline was 2/20/05 as affirmed by several Angenmap announcements. Approximately 50,000 new pig sequences were submitted in 2005. Cluster analyses, that will feed into the oligo design, are being performed at Chris Elsik's lab at Texas A&M. Sequence quality assessment has been completed. She expects cluster analyses to develop the ~20-25,000 non-redundant sets of target sequences to be completed by early May, 2005. Negative control oligos could include use of *Arabidopsis* or *Methanococcus* (Archaea) gene sequences with no clear orthology to swine. Alternately random sequence controls could be used but there have been problems with this approach for the current array control oligos due in part to the lack of a swine genome sequence. It is unclear which positive pig sequences to use because of different tissue expression levels, even for "control genes." An alternate being considered is to use a spike control, and related oligos, as an index of stringency of hybridization. The need for post synthesis, amino modification has been discussed, although all vendors feel that non-modified oligos give great results on either epoxy or amino silane slides, best results can be achieved with modified oligos imprinted on epoxy slides. We are considering no modifications given problems with their

long-term stability and cost (potentially adding >\$120,000 to the cost of \$40K per set). Scott Fahrenkrug and Jerry Taylor, UMO, are working with companies to get competitive bids on oligo production for both swine and cattle. The Swine Genome Coordinator has set aside funds, \$40-45,000, for this next set of oligos. Each set is expected to contain 10 x 200 pm aliquots of all oligos; ~1000 slides can likely be printed with 200 pm, thus yielding up to 10,000 chips for the NRSP8 community. Interest has been clearly stated by two other groups for purchasing oligo sets. Bids will be compared for 1) programs for oligo design from the non-redundant sets of sequences provided; 2) quality assurance for oligo synthesis; 3) availability of oligo annotation for the user community, as per MIAME conventions. NRSP8 funds will be used to buy the sets of oligos for the NRSP8 swine genome community. Each lab will have to pay for slide printing, bids will be requested later for reduced cost NRSP8 printing (kindly submitted by Joan Lunney, USDA BARC).

**The 2005 NRI competitive grants program has been announced ([www.reeusda.gov/nri/](http://www.reeusda.gov/nri/)).** Deadline dates are now May 17, 2005, for Animal Growth and Nutrient Utilization; and June 15, 2005, for Animal Genomics, Animal Genome Reagent & Tool Development and Functional Genomics of Agriculturally Important Organisms. Total 2005 NRI funding remains was set at \$181M.

**Have you tried the pig quantitative trait loci (QTL) database (PigQTLdb) that was created at Iowa State University.** The database and its peripheral tools were made to compare, confirm and locate on pig chromosomes the most feasible location for a candidate gene responsible for quantitative trait(s) important to pig production. To date, 791 QTLs from 73 publications have been curated into the database at <http://www.animalgenome.org/QTLdb/> and new data are continually being added to it. The database content has also been submitted to the NCBI Gene and Map Viewer resources, where the information about markers are matched to marker records in NCBI's UniSTS database. Support from NAGRP and NCBI have made this possible.

**The 3rd International Symposium on Genetics of Animal Health (formerly, Candidate Genes for Animal Health) will convene on July 13-15, 2005, in Ames, Iowa, USA.** The meeting will feature several invited speakers, contributed presentations and poster sessions and should be an exciting continuation of past meetings. Please see GAH2005 web home page: <http://www.ans.iastate.edu/GAH2005.html>.

**Upcoming meetings (see: <http://www.genome.iastate.edu/community/meetings.html>)**

54th Annual National Breeders Roundtable, May 5-6, 2005, Airport Marriott Hotel, St. Louis, MO. For more info., contact, Larry Brown at [LBrown@poultryegg.org](mailto:LBrown@poultryegg.org); Tel - (770) 493-9401, or George Ansah, Tel: (607) 257-6591; [george.ansah@isapoultry.com](mailto:george.ansah@isapoultry.com)

Chicken Genomics and Development Meeting, May 8-11, 2005. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY. See <http://meetings.cshl.edu/meetings/chick05.shtml> for further information.

The Biology of Genomes, May 11-15, 2005, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY. See <http://meetings.cshl.edu/meetings/genome05.shtml> for more information.

1st International Cytogenetics and Genome Society Congress, June 14-18, 2005, University of Granada, Granada, Spain. See [www.icgs-congress.org](http://www.icgs-congress.org)

14th Colloquium on Animal Cytogenetics and Gene Mapping, July 3-7, 2005, Puerto Vallarta, Mexico. See <http://www.cucba.udg.mx/14thnacacgm/>

3rd International Symposium on Genetics of Animal Health, July 13- 15, 2005, in Ames, Iowa, USA, Please see:  
<http://www.ans.iastate.edu/GAH2005.html>

2005 UC Davis Transgenic Animal Conference, Aug. 14-18, 2005, Granlibakken Conference Center, Tahoe City, CA. See <http://conferences.ucdavis.edu/TGAC>

Symposium on Integration of Structural and Functional Genomics (14th Annual Growth Factor and Signal Transduction Conference), September 22-25, 2005, Iowa State University, Ames, Iowa. See <http://www.bb.iastate.edu/~gfst/homepg.html>

Plant and Animal Genome XIV, joint with the NAGRP annual meetings, Jan. 14-18, 2006, Town & Country Convention Center, San Diego, CA. See [www.intl-pag.org/](http://www.intl-pag.org/).

**Items for *Pig Genome Update 73*** can be sent to me by no later than June 15 please.

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*Paid for by funds from the NRSP-8 USDA/CSREES sponsored Pig Genome Coordination Program.*