



# POULTRY GENOME NEWSLETTER 2006

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## Chicken Genome Sequencing

A proposal from the Washington U. Genome Sequencing Ctr.-WUGSC (Warren et al., <http://www.genome.gov/Pages/Research/Sequencing/SeqProposals/ChickenFinishingSeq.pdf>) to do additional sequencing of the chicken genome to bring it to near-finished quality at a cost of ~\$6.9M has been approved by NHGRI. Timing is still uncertain; WUGSC will first proceed with chicken or with chimp genome finishing, pending NHGRI input. Another proposal (<http://www.genome.gov/Pages/Research/Sequencing/SeqProposals/ZebraFinchSeq2.pdf>) to sequence the zebra finch genome (to 6X draft coverage) has also been approved by NHGRI. This also will be done at WUGSC, but the timing has yet to be finalized. NHGRI had earlier approved a proposal to build a BAC contig map for zebra finch and do some targeted sequencing. This will be the second avian genome to be sequenced. (Chicken and zebra finch are estimated to share a last common ancestor that lived, very roughly, 100 million years ago.)

**PLEASE NOTE:** the plan to do further chicken genome sequencing includes a phase in which about 3,500 BACs will be sequenced individually to ~3X coverage. Most of these will come from problem regions in the present assembly. If you have a particular gene or region of interest, especially if there are major errors or gaps in its present sequence, you can propose one or more BACs in the region for inclusion in the targeted sequencing group. Recall that BAC contigs that cover a specific gene or region can be found on the browsers (Ensembl, [http://www.ensembl.org/Gallus\\_gallus/](http://www.ensembl.org/Gallus_gallus/); NCBI, <http://www.ncbi.nlm.nih.gov/genome/guide/chicken/>; and UCSC, <http://genome.ucsc.edu/cgi-bin/hgGateway?org=Chicken&db=0&hgsid=30948908>) and/or at the Wageningen ChickFPC browser at <http://www.bioinformatics.nl/gbrowse/cgi-bin/gbrowse/ChickFPC> (see more below). In addition, a list of BACs that are likely to contain specific chicken genes or markers can be found at <http://poultry.mph.msu.edu/resources/Resources.htm#bacdata>. (Note that the BACs identified by these sites for any given gene may differ due to differences in the sets of BACs fingerprinted, end sequenced and/or hybridized.) If you have regions/BACs that you wish to propose for targeted sequencing, please email Wes Warren of WUGSC at [wwarren@watson.wustl.edu](mailto:wwarren@watson.wustl.edu).

A second “build” of the chicken genome sequence is presently underway. The assembly has been improved using a new PCAP assembler, some additional directed sequence data (USDA and NHGRI funded), RH and SNP map data and other input obtained since the first sequence appeared 03/01/04. Soon, this should be sent to the genome browsers (see above). You’ll also be able to download it at: <http://genome.wustl.edu/genome.cgi?GENOME=Gallus%20gallus>.

## PAG XIV & NAGRP/NC-1008 Meeting Report

Many of you just returned (are still recovering?) from **PAG-XIV**, held **January 14-18, 2006** in sunny San Diego. One of the best **Poultry Workshops (NC-1008/NRSP-8-Poultry meetings)** in recent memory was organized by **Doug (a.k.a. "Furface") Foster**, chair of NC-1008, and **Chris Ashwell**, chair for NRSP-8-Poultry. Invited guest talks were given by **Jim Reecy** (NRSP-8 database coordinator), **Cynthia Taylor** (Illumina, Inc.), **Marie-Cecile van de Lavoie** (Origen Therapeutics), **Martien Groenen** (Wageningen U.), **Alice Kuo** (ARS-BARC), and **Massoud Malek** (ETH, Zurich), in addition to a full array of Station reports. A recurring theme was the recent Illumina chicken SNP project, supported by a combination of USDA-NRI, ARS, NRSP-8 Coordinator, foreign and industry support (see the previous issue of this newsletter). This has greatly enhanced the quality of the chicken linkage map, QTL searches, and mutant identification efforts. Several other SNP projects are underway and even the existing data still remain to be fully analyzed and utilized. The main PAG-XIV meeting opened with a talk from **Ari Patrinos**, head of the Office of Biological and Environmental Research at the Department of Energy's Office of Science and a key player in the human genome project. A recurring theme of the plenary talks was "higher order" Systems Biology and integration of genomic information with other data pipelines. Among the highlights were talks by **Ariel Darvasi** (mouse QTL searches), **Bernhard Palsson** (multidimensional genome annotation/prokaryotic genome evolution), and **Rob Martienssen** (RNAi/heterochromatin silencing). In addition to plenary talks and workshops, an enormous poster session was held, with lots of interesting reports. Abstracts can be found at <http://www.intl-pag.org/14/abstracts/>. **USDA chose PAG XIV at which to announce that it would contribute \$10M to the consortium led by the U. of Illinois to sequence the swine genome.** NC-1008/NRSP-8-Poultry held its usual rushed business meeting. **Sam Aggrey** (GA) joined us this year, and **Shane Burgess** (MS) will soon be added (both spoke at the meeting). NC-1008 welcomed its new Administrative Advisor, **Mo Saif**. For the next two years, chairpersons will be **Tom Porter** (NC-1008) and **Kent Reed** (NRSP-8-Poultry) with the secretaries being **Eric Wong** and **Huanmin Zhang**, respectively. NC-1008 objective coordinators will be **Chris Ashwell** (obj. 1), yours truly (obj. 2) and **James Zhu** (obj. 3). "Congratulations" also go to **Mary Delany** who was elected next year's overall NRSP-8 secretary/chair-elect (next year's NRSP-8 chair will be **Claire Gill**). In further good news, no incriminating pictures have yet to appear from this year's banquet, but it's still early.

**Changes anticipated for next year's PAG-XV:** (no, not a new location). In order to meet the ever-growing demand for workshop space, plenary lectures will be reduced to two each on Tuesday and Wednesday, with an earlier start (8 a.m.), and workshops will be added between 10 a.m. and lunchtime. A single keynote/plenary speaker will be added to the program after the opening reception/Poster session on Sunday night. **Note: anyone with suggestions about PAG-XV speakers or other aspects of PAG should contact PAG animal reps, including Hans Cheng, Max Rothschild, Claire Gill, Mary Delany, Michel Georges and Jim Reecy.**

## ON THE ROAD AGAIN. UPCOMING MEETINGS:

IMPORTANT NOTE: Regularly updated poultry meeting information is now available at [http://www.animalgenome.org/share/mtg\\_chic.html](http://www.animalgenome.org/share/mtg_chic.html). Meeting organizers can enter their own meeting information on-line at [www.animalgenome.org/cgi-bin/angenmap/mtg\\_new](http://www.animalgenome.org/cgi-bin/angenmap/mtg_new).

Workshop on Chicken Genomics & Development, May 7-10, 2006, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY. See <http://meetings.cshl.edu/meetings/chick06.shtml>

The Biology of Genomes, May 10-14, 2006, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY. See <http://meetings.cshl.edu/meetings/genome06.shtml>

- 2<sup>nd</sup> International Symposium on Animal Functional Genomics, May 16-19, 2006, Henry Center, Michigan State U., East Lansing, MI. See [www.isafg.msu.edu](http://www.isafg.msu.edu)
- 17<sup>th</sup> European Colloquium on Animal Cytogenetics and Gene Mapping, June 18-21, 2006, Lisbon, Portugal. See [www.realvitur.pt/17\\_ecacgm.php](http://www.realvitur.pt/17_ecacgm.php)
- Poultry Science Association Annual Meeting, July 16-19, 2006, University of Alberta, Edmonton, Canada. See <http://www.poultryscience.org/>.
- 4<sup>th</sup> International Workshop on the Molecular Pathogenesis of Marek's Disease Virus, August 5-8, 2006, Clayton Conference Center, U. of Delaware, Newark, DE. See <http://ag.udel.edu/conference/mareksconference.htm>
- 8<sup>th</sup> World Congress on Genetics Applied to Livestock Production, August 13-18, 2006, Belo Horizonte, MG, Brazil. See [www.wcgalp8.org.br](http://www.wcgalp8.org.br)
- ISAG 2006, 30<sup>th</sup> International Conference on Animal Genetics, August 20-25, 2006, Porto Seguro - Brazil. See <http://www.cbra.org.br/eventos/XXXisag.do>
- XII European Poultry Conference, September 10-14, 2006, Verona, Italy. See <http://www.epc2006.veronafiere.it>
- 24<sup>th</sup> Stadler Genetics Symposium, "Genomics of Disease", October 2-4, 2006, University of Missouri-Columbia, Columbia, MO. See <http://muconf.missouri.edu/stadler/>
- Plant and Animal Genome XV, joint with NC-1008 and NAGRP annual meetings, Jan. 13-17, 2007, Town & Country Convention Center, San Diego, CA. See [www.intl-pag.org/](http://www.intl-pag.org/).

### WASHINGTON FUNDING UPDATE:

**CSREES FY 2006 National Research Initiative (competitive grant program)** information can be found at <http://www.csrees.usda.gov/fo/fundview.cfm?fonum=1112>. Total FY 2006 NRI funding was estimated at \$183M, but this will likely be reduced by across the board cuts of 1% (to end up at about the same level as last year). **Note that there are some changes in the FY2006 NRI. Program 43.0, Animal Genome, has been divided into Applied Animal Genomics, Tools and Reagents, Bioinformatics, and Functional Genomics.** (Functional Genomics will appear on alternate years beginning in FY 2006.) The due date for all is June 15, 2006. As mentioned last issue and discussed again at PAG-XIV, CSREES officials are concerned about the low overall NRI success rate (14 of 73 proposals funded in the 2005 Animal Genome Program or 19%). Efforts (sometimes controversial) have been made to focus the NRI RFA to reduce the effort going into preparing and reviewing unsuccessful proposals. However, we all agree that, absent a significant increase in Federal and other sources of financial support for agricultural research, the scientific community will have little choice but to compete as best they can for all those funds that remain available. Most of us also agree that a fair and open competition, followed by rigorous peer review and careful allocation of resources, is the best way to insure the future of animal genomics and agricultural research, in general. A report provided by CSREES's **Peter Burfening** at PAG-XIV showed that, over the last 7 years, the success rate by species emphasis area has been remarkably close to the overall average of 23% for all species for which enough applications were submitted to be statistically meaningful.

### POULTRY MICROSATELLITES

**Microsatellite primer kits:** Information on chicken microsatellite primer pairs is at <http://poultry.mph.msu.edu/resources/microkits.htm>. The framework primer kit (147 well-spaced microsatellite primer pairs) called the "Comprehensive Mapping Kit #7" and the Population Tester Kit, designed for the rapid testing of the suitability of populations and/or chicken microsatellites for a given application, are still available. If interested, contact: [hcheng@msu.edu](mailto:hcheng@msu.edu) or [dodgson@msu.edu](mailto:dodgson@msu.edu), describing your intended use.

## CHICKEN CHIPS

The 13K chicken spotted cDNA glass slide array is still available from the Array Facility at the Fred Hutchinson Cancer Research Center, FHCRC, normally at \$150 per array. Email requests to [genomics@fhcrc.org](mailto:genomics@fhcrc.org). NAGRP Coordination funds have been used to make limited numbers of free test arrays available to NAGRP members. Additional sets have been secured; contact [dodgson@msu.edu](mailto:dodgson@msu.edu) if interested. **WE HAVE A FEW FREE SETS LEFT THAT WE ARE ANXIOUS TO GET DISTRIBUTED SOON: FIRST COME - FIRST SERVE.** See *Burnside et al., BMC Genomics* (<http://www.biomedcentral.com/bmcgenomics>) 6:13 (2005) for more details. Affymetrix, Inc. is marketing the GeneChip® Chicken Genome Array that measures levels of 32,773 chicken transcripts and 684 chicken viral transcripts from 17 different avian viruses. See <http://www.affymetrix.com/products/arrays/specific/chicken.affx>.

## BAC AT YOU!

**Chicken BAC libraries** have been constructed at Texas A&M (~39,400 each in three sublibraries called TAM31, TAM32, and TAM33, respectively; Lee et al., *Animal Genetics* 34: 151) and by **Pieter de Jong** (CHORI-261: ~73,700 BACs with ~195 kb inserts for ~12x coverage). Pieter has also generated a **turkey BAC library (CHORI-260)**. If interested in either library, see [www.chori.org/bacpac/](http://www.chori.org/bacpac/). Some free filter sets with spotted arrays of CHORI-260, CHORI-261, TAM31 and TAM33 BACs are still available, email [dodgson@msu.edu](mailto:dodgson@msu.edu).

**BAC Contig Physical Map; ChickFPC and ChickAce.** A BAC contig physical map comprised of about 260 contigs, nearly 80% of which have been anchored to the genetic linkage/chromosome map has been described (Wallis et al., *Nature* 432:761-764, 2004). The **ChickFPC** browser at <http://www.bioinformatics.nl/gbrowse/cgi-bin/gbrowse/ChickFPC> allows one to search the map. BAC locations can also be found on the sequence browsers mentioned above. At ChickFPC, BACs from the TAMU libraries have the prefix JB, JE, or JH for the TAM31, TAM32, and TAM33 libraries, respectively. CHORI-261 BACs have the prefix JA. White Leghorn BACs from the Crooijmans et al. library (*Mammalian Genome* 11: 360-363, 2000) have the prefix bW.

## Poultry Genome Newsletter Archive

Poultry Genome Newsletters are distributed electronically through Angenmap, the Animal Genome Discussion Group (<http://www.animalgenome.org/community/discuss.html>) and by hard copy to those on our mailing list. If you wish to be added to or removed from the hard copy mail list, please email [dodgson@msu.edu](mailto:dodgson@msu.edu). All previous newsletters are archived at <http://poultry.mph.msu.edu/newsletters/newsletters.htm>.

## PLEASE PROVIDE YOUR INPUT

The Poultry Coordinators are always glad to hear from NRSP-8 members and other readers about ways that we can improve the coordination effort or provide resources that are needed and with which we may be able to help. Also, let us know if you have items of general interest to the poultry genetics community that we can include in this Newsletter.

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Jerry Dodgson, Poultry Coordinator  
Dept. of Micro. & Molecular Genetics  
2209 Biomed. & Phys. Sciences Bldg  
Michigan State University  
East Lansing, MI 48824  
email: [dodgson@msu.edu](mailto:dodgson@msu.edu)

Hans Cheng, Co-Coord.  
USDA-ARS ADOL  
3606 E. Mt. Hope Ave.  
East Lansing, MI 48823  
email: [hcheng@msu.edu](mailto:hcheng@msu.edu)