

## V. MAIZE GENETICS AND GENOMICS DATABASE ([www.maizegdb.org](http://www.maizegdb.org))

### New Personnel in 2007

Lisa Harper USDA-ARS Plant Gene Expression Center, Albany, CA  
Feb 2007, Part-time Curator and Outreach Coordinator

In her first year on staff, Lisa plans to visit 3 cooperator sites: University of Florida, University of Georgia, and University of Arizona. One of her first curation tasks is to better integrate data from the RescueMu and Maize Inflorescence Architecture Projects with the rest of MaizeGDB so that these datasets can be searched via the site's integrated mechanisms.

Taner Sen USDA-ARS at Iowa State University, Ames, IA

To begin June 2007, Computational Biologist

Early on, Taner will be working to incorporate a genome browser into MaizeGDB to display the B73 sequence and to serve as a basis for representing gene models. Be on the lookout for inquiries from Taner on your preferences for genome browsing capabilities!

### Data Improvements

MaizeGDB has added and facilitated the addition of a wide variety of new data, along with incrementally improving the existing data through regular manual and automated updating. Some of our most noteworthy newer initiatives in this area are described below.

### Sequence Pipeline

Public sequence data for all of the Zea species are updated from Volker Brendel's PlantGDB on a monthly basis and linked with relevant manually-curated data within MaizeGDB. Individual sequences are also linked to contigs generated by external projects that include PlantGDB and the Dana Farber Cancer Institute. The Maize Genome Sequencing Consortium's B73 sequences are associated to BACs on a monthly basis from the data releases posted at [maizesequence.org](http://maizesequence.org).

### Editorial Board

We have initiated and currently maintain an Editorial Board whose members contribute a paper each month to be highlighted at MaizeGDB. Perhaps most exciting are reports that the Editorial Board has directly led to the founding of journal clubs on various campuses! Students and faculty alike download the recommended papers and meet to discuss them. The 2006 Editorial Board was made up of: Tom Brutnell (chair), Surinder Chopra, Karen McGinnis, Wojtek Pawlowski, and Jianming Yu. The 2007 Board consists of: Marja Timmermans (chair), Guri Johal, Damon Lisch, Gael Pressoir, and Moira Sheehan.

### Data Additions – Larger Sets

TILLING: We have worked extensively with Cliff Weil's team at Purdue to include the output of the Maize TILLING project in MaizeGDB. This includes integrated primer, probe, locus, variation, and gene product data, along with an integrated interface for ordering stocks from the TILLING project. The current schedule (see [http://www.maizegdb.org/data\\_schedule.php](http://www.maizegdb.org/data_schedule.php)) is to update TILLING data twice yearly.

New maps: The Maize Mapping Project and a number of community members have volunteered a number of new maps for inclusion in MaizeGDB. These include new QTL maps, continued refinements of the IBM and IBM Neighbors maps, and maps that describe the structure of the AGI physical maps. The current schedule is to update maps once each spring.

### Contributing your data to MaizeGDB

You may contribute data in a number of ways to MaizeGDB. The easiest is very like a 'wiki', where you simply add a comment using the annotation tool. You will first need to register, using the menu item 'annotation' on the top menu bar of the homepage. Once registered, every time you access MaizeGDB, you will be able to annotate any page. Annotations will appear in the monthly updates of the database. A second way is to use the community curation tools. Inquire at [mgdb@iastate.edu](mailto:mgdb@iastate.edu) for access.

If you are developing a project that will generate large datasets and that you would like to submit to MaizeGDB, you need to contact Carolyn Lawrence before you submit the proposal.

### New Tools

We have continued our commitment to providing a consistent and clean interface, continued maintenance and improvement of that interface, and integration of new interface options where appropriate. Some noteworthy changes include new map displays and a stand-alone tool to compare cytological and genetic maps.

Map Display Update: One major interface addition is the inclusion of new map displays designed with the aid of commentary from a number of maize community members. We have added three new options that enable interesting new ways of viewing maps without

cluttering the interface: a sequence view, a primer view, and a scores view

**UMC 98 1 (map)**

[summary view](#) | [sequence view](#) | [primer view](#) | [score view](#)

**Source:** UMC  
**Linkage Group:** 1

**Mapping Panel(s):**  
**Tx303/C0159 IF2 1995-8**  
 Panel Type: Immortal F2  
 Parent: Tx303 (female parent)  
 Parent: C0159  
 Number of Members of Population: 54

**Related Papers:**  
 (general) Davis, G et al. 1999. Genetics 152:1137-1172

This map includes the following loci: (see more details)  
 Download this map in text format!

Compare this map with [611A x T218 F2 1998 1] Compare ->  
 Currently, this map is color-coded. CBM means core bin marker.  
 Display this map with... [color-coded loci] Show me!

Locus	Coordinate	Bin
csu804(dnp)	0.00	1.00
rgpc54	6.40	1.00
tuB1 (CBM 1.01)	11.00	1.01
csu738	11.00	1.00
umc94a	11.90	1.01
hnRNP5a	12.00	1.01
fus6	12.00	1.01

Figure 1. This is a map view of UMC 98, arrived at by clicking on UMC 98 on the *tub1* locus record. There are two things to note here. First, right below the name of the map there is a line with “summary view” in bold and links to “sequence view”, “primer view”, and “score view.”

Primer Type	Primer	Probe	Locus	Map Coordinate
N/A	N/A	p-csu804	csu804(dnp)	0
N/A	N/A	p-rpc654	rpc654	6.4
N/A	N/A	p-csu738	csu738	11
N/A	N/A	p-tub1	tub1	11
N/A	ACTTGCCTGGCCCGCTTAC	p-phl056	tub1	11
N/A	CGCACACACTTCCAGAA	p-phl056	tub1	11
N/A	TGCTCACATTCACTGACAGCTCAG	p-phl097	tub1	11
N/A	CCAGCACAGATGATTAACGCC	p-phl097	tub1	11
Left End	GCATGGATGAGATGGAGTCAGT	CL2242_8_ov	tub1	11
Right End	ATGTGCTCTCACGGCTCTGAGAC	CL2242_8_ov	tub1	11
N/A	N/A	CL2242_8	tub1	11
Left End	CCGAGGTTTCCAGTCACCC	p-umc94	umc94a	11.9
Right End	ACGGATAACAATTTCACAGGA	p-umc94	umc94a	11.9
N/A	N/A	p-bnl8.05	bnl8.05a	12
N/A	N/A	p-csu589	csu589	12
Left End	GCTCTGGTTTGGCTCTATT	csu589_PCR	csu589	12
Right End	CTTGATAAACAGCAATTGTC	csu589_PCR	csu589	12
N/A	N/A	p-csu896	fus6	12
Left End	ACGCCGCTTATCACTTTCC	CL3244_1_0v	fus6	12
Right End	AGAGCCGAGGATCAAGAAGT	CL3244_1_0v	fus6	12

Figure 3. Clicking on the “primer view” link takes you to a map view that has four columns: primer, probe, locus, and coordinate. This table identifies probes that detect each locus on the map and also notes those that have primers available.

Morgan2McClintock: The Morgan2McClintock Translator was developed through our continued collaboration with Hank Bass and a new collaboration with Lorrie Anderson. The tool utilizes the maize Recombination Nodule map (Anderson et al., 2003 and 2004) to calculate approximate cytological positions for loci given a genetic map, and to calculate approximate genetic positions for loci given a cytological map (Lawrence et al., 2006). Morgan2McClintock is a stand-alone tool and can be run on any machine enabled to serve PHP. You can use it online at MaizeGDB: from the home page, choose "maps", then choose Recombination Nodule Map to arrive at <http://www.maizegdb.org/RNmaps.php>). Alternatively, go to: <http://www.lawrencelab.org/Morgan2McClintock>.

## **Maize Community Support**

The MaizeGDB team offers support to the maize community in a variety of fashions. This support aids the annual Maize Genetics Conference, provides community addresses for mailings, an abstract submission interface, assembly and printing of the program, and integrates the abstracts into MaizeGDB. It supplies address lists for this Newsletter, and hosts the Newsletter, with links to the database. We facilitate community interaction with the Maize Genetics Executive Committee, including community surveys, elections and community-wide messaging on important issues. We also maintain a community job board (which has had dozens of job postings and has significantly aided at least ten job placements since its initiation), as well as a community calendar of upcoming events that may be of interest to the larger community.

## Copies and Schema of MaizeGDB

Locus	Map Coordinate	Accession #	PlantGDB Contig
csu004(dbn)	0 W21728	PUT-157a-Zea_mays-06337	
rgpc654	6.4 N/A	N/A	
csu738	11 AA143916	PUT-157a-Zea_mays-013137	
tub1 (CBM 1.01)	11 A1665233	PUT-157a-Zea_mays-2487255032	
tub1 (CBM 1.01)	11 AY110929	PUT-157a-Zea_mays-2487255032	
tub1 (CBM 1.01)	11 CC749434	N/A	
tub1 (CBM 1.01)	11 XS2878	N/A	
tub1 (CBM 1.01)	11 XS2879	PUT-157a-Zea_mays-2487255032	
umc94a	11.9 N/A	N/A	
bnl8.05a	12 N/A	N/A	
csu589	12 CC832284	N/A	
fus6	12 A1947548	PUT-157a-Zea_mays-0106758	
fus6	12 AW00020	PUT-157a-Zea_mays-237420	
fus6	12 AW052995	PUT-157a-Zea_mays-237420	
fus6	12 AY110081	PUT-157a-Zea_mays-0106759	
fus6	12 CC148925	ZmGST11_12-04_58903.1	
fus6	12 W21618	PUT-157a-Zea_mays-237420	
bnl5.62a	12.3 N/A	N/A	

Figure 2. If you click on the "sequence view," you are shown columns for: the locus name, the map coordinate, an accession number, and a PlantGDB contig.

Figure 4. Clicking on “score view” allows you to see the markers used to generate a particular map along with associated map scores, enabling you to review the raw mapping data for the experiment. Note that not all maps in MaizeGDB have associated scores; if you see the “score view” option, you’re in luck!

Full copies of the database as well as individual tables and custom-formatted dumps are provided to individuals who make requests to the MaizeGDB team at mgdb@iastate.edu. Copies support Oracle, MySQL, and Microsoft Access. The current MaizeGDB schema can be accessed at <http://www.maizegdb.org/MaizeGDBSchema.pdf>.

#### **Five-Year Plan**

We are in the process of drafting our five-year plan for the USDA-ARS. Objectives were developed with input from the MaizeGDB Working Group and are available online at <http://www.maizegdb.org/objectives.php>.

#### **Acknowledgements**

MaizeGDB is guided by members of the community of maize geneticists through feedback sent to us through the website, and by guidance from the MaizeGDB Working Group. Current membership includes Volker Brendel, Ed Buckler, Karen Cone, Mike Freeling, Owen Hoekenga, Lukas Mueller, Marty Sachs, Pat Schnable, Tom Slezak (chair), Anne Sylvester, and Doreen Ware.

#### **Citing MaizeGDB**

MaizeGDB may be cited using any or all of these references:

Lawrence CJ, Schaeffer ML, Seigfried TE, Campbell DA, Harper LC, 2007. MaizeGDB's new data types, resources and activities. *Nucleic Acids Res.* 35:D895-900.

Lawrence CJ, Seigfried TE, Brendel V, 2005. The maize genetics and genomics database. The community resource for access to diverse maize data. *Plant Physiol.* 138:55-58.

Lawrence CJ, Dong Q, Polacco ML, Seigfried TE, Brendel V, 2004. MaizeGDB, the community database for maize genetics and genomics. *Nucleic Acids Res.* 32: D393-397.

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