VIII. MAIZE GENETICS AND GENOMICS DATABASE

MaizeGDB
Maize Genetics and Genomics Database
(www.maizegdb.org)

The five-year plan for MaizeGDB is under review in early 2008 by the ARS peer review process. The plan was developed with inputs from our Working Group and the Allerton 2007 Report (MNL 82:111-117). The primary objective is to integrate new maize genetic and genomic data in the database, specifically: (1) expand mutant and phenotype data and tools; (2) expand structural and genetic map sets, notably integration of the IBM genetic maps with the B73 genome sequence; (3) creation of views that convey the substantial variation in maize genome structure; (4) integration of next-generation genetic maps being generated by the Maize Diversity Project into a genomic view to enable its effective use by plant breeders; (5) provide access to gene models calculated by leading gene structure prediction groups; and (6) compile and make accessible at MaizeGDB this Newsletter. A second objective is to provide community support activities, such as lending help to the community of maize researchers to ensure their data can be made available through MaizeGDB; coordinating annual meetings; and conducting elections and surveys.

Data Highlights for 2007

Genetic maps: The NAM (nested association maps) maps, based on SNP (single nucleotide polymorphism) genotyping from the Maize Diversity Project are in process; all coordinates have been entered with links to allele alignment displays at www.panzea.org. Full documentation will include probe details, map scores for 26 mapping populations, and allele information, with links to GRIN, GenBank and Panzea. Maps anticipated in the near future include the ISU Map7 (Indel) maps from Pat Schnable and an updated Genetic Map (MNL 82:87-102) prepared by Ed Coe. Neighbors software has been updated, in collaboration with Hector Sanchez-Villeda and will facilitate updating this Consensus Map Product in the future.

New links: MaizeGDB now maintains deep links to www.panzea.org for allele alignments and to www.maizesquence.org for contigs and sequenced BACs. NCBI now links RefSeq and Gene records to MaizeGDB locus records, and has imported official names, full names, synonyms and probes.

Mutants and phenotypes. We are processing data from the EMS populations generated by the Maize Inflorescence Architecture Project (~4700 stocks), and The RescuMu population generated by the Maize Gene Discovery Project (~42,000 stocks). These data utilize the Plant Ontology terms, and regular updates of our associations to genes and stocks are supplied to that project, www.plantontology.org.

Data entry templates. We have customized spreadsheet templates for import of data from the Maize Tilling Project and the Maize Chromatin Project. Similar datasets should be able to use these templates.

Outreach

Nov 2007 was our first trip to an off-site location, the University of Florida, to provide a tutorial and explore data access issues. It was well received by persons at that site and we plan up to 3 such visits each year. Persons interested in scheduling a trip to their location should contact Lisa Harper or Carolyn Lawrence. Presentations in 2007 included the Plant and Animal Genome XV; Allerton & Maize Genetics Conference; GMOD meeting; Genome; 2nd Int. Blocurator Meeting; and Maize Crop Germplasm Committee. MaizeGDB hosted an exhibit booth at PAG XVI 2008; the Plant Genome DB Outreach Consortium at that involved 10 database groups in total.

Editorial Board

We have initiated and currently maintain an Editorial Board whose members contribute a paper each month to be highlighted at MaizeGDB. The 2008 Board consists of: Marja Timmermans (Chief), Kelly Dawe, Jim Holland, Mike Kolomiets and Damon Lisch. For full details go to http://www.maizegdb.org/editorial_board.php.

Stakeholder Input

In addition to the outreach activity referred to above, we respond quickly, typically within 24 h, to direct inputs by email, phone or comments submitted from each page in the database. The Maize Genetics Executive Committee (MGEC) and our Working Group provide oversight and work with us on developing surveys of the community. Most recently the MGEC surveyed the community preferences for a Genome Browser. The results support use of GBrowse, an open source software in use by many model organism databases, including TAIR (Arabidopsis).

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 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. At this time we have subcontracts from two NSF-funded projects: (1) Construction of Comprehensive Sequence Transposon Resources for Maize with Don McCarty as PI; and (2) The Grass Regulome Initiative: Integrating control of gene expression and agronomic traits across the grasses", with Erich Grotewold as PI.

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.

Acknowledgements

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