

GrainGenes, the Triticeae Genome Database

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ITMI-COST Workshop
3 September, 2009

First presentation of GrainGenes

- Third ITMI Public Workshop, September 1992, CIMMYT, Mexico
- Before there was an Internet or laptops

First presentation of GrainGenes

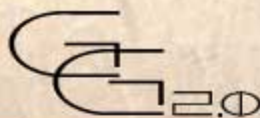
- Third ITMI Public Workshop, September 1992, CIMMYT, Mexico
- Before there was an Internet or laptops
- Met Philippe Leroy, INRA
 - Proposing a wheat genome database

INRA support for GrainGenes

- “FBA” and “FBB” RFLP probes
- Many additional probes subsequently
- GrainGenes mirror site at Jouy-en-Josas, France, since 1996
- See presentations later today on TriAnnot, GnpIS

GrainGenes Functions

- GrainGenes website
 - Communications, publicity
 - Data sharing, e.g. TREP
- GrainGenes database
 - 200 Maps
 - 40,000 Markers
 - 1,600 QTLs
 - Phenotypes
 - Genotypes



GrainGenes: A Database for Triticeae and Avena

[Home](#)

GrainGenes Tools

[Browse GrainGenes](#)
[Quick Queries](#)
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[BLAST](#)
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Query Data Types

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Web Resources

[Genomics](#)
[Mapping](#)

Featured Tool on GrainGenes

Barley Bin Map

Showing 1,597 kb from Hordeum-Bins-1H, positions 0 to 1,596

Instructions [Hide] Search using a sequence name, gene name, locus, or other landmark. The wildcard character * is allowed. **Examples:** Hordeum-Bins-1H, Hordeum-Bins-1H 1..250, Aga6, Chs* [Help]
To center on a location, click the ruler. Use the Scroll/Zoom buttons to change magnification and position.

Landmark or Region

Scroll/Zoom:

Hordeum-Bins-1H



GBrowse. GBrowse, developed by the [GMOD](#) group, is a Genome Browser that provides a wealth of genome annotation for maps in

Hot Topics

- [Barley CAP Newsletter, September](#)
- [CIMMYT International Nursery Data](#)
- [Jorge Dubcovsky re rust \(.mp3\)](#)
© [radioparallax.com](#)
- [EWAC, European Cereal Genetics Co-operative](#)
- [Stem rust \(*P. graminis*\) sequenced!](#)
- [Status of oat markers](#)
- [Brachypodium website](#)
- [Resistance to stem rust Ug99 -- 2006 nursery data](#)
- [International Barley Sequencing Consortium](#)
- [Avena Ave.](#) -- portal to oat data
- [Rye genetics](#) -- genes, markers, linkages
- [Barley SNP Database](#)
- [Global Rust Initiative](#) - Ug99 threat
- [ITMI Triticeae Genomics Vision](#)
- [European Triticeae Genomics Initiative](#)
- [Interactive Oregon Wolfe Barley Maps](#)
- [More...](#)

Meeting Announcements

- [11th International Wheat Genetics](#)

Stem Rust info on the Pathology page

Genetic Markers
Sequences
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GrainGenes 

Stem Rust Race Ug99

In Uganda in 1999 a new race of the wheat stem rust pathogen arose, a race that is virulent against *Sr31*, the most widely deployed resistance gene worldwide. The potential impact of this new race is becoming clear as more information is gathered. On 9 September 2005 the [Global Rust Initiative](#) was established to respond to this threat.

Research data:

[Stem rust evaluations of nursery entries in Njoro, Kenya](#)

Ug99 reactions of all wheat and barley lines in the 2005 and 2006 nurseries. From the USDA-ARS Cereal Disease Laboratory.

[Stem Rust Resistance \(Sr\) Genes](#)

Documentation of all known Sr genes. From the USDA-ARS CDL.

Published results and analysis:

[Singh et al., 2006](#). **Current status, likely migration and strategies to mitigate the threat to wheat production from race Ug99 (TKKS) of stem rust pathogen.**

A thorough review of the current status as of October 2006.

[Jin and Singh, 2006](#). **Resistance in U.S. Wheat to Recent Eastern African Isolates of *Puccinia graminis* f. sp. *tritici* with Virulence to Resistance Gene *Sr31***

Results from the 2005 Kenya nursery, screening 450 wheat lines.

[R.P. Singh et al. 2005](#). **Spread of a Highly Virulent Race of *Puccinia graminis tritici* in Eastern Africa** (pdf, 46 KB)

Resistance genes that are effective against Ug99, and which ones are likely to be useful.

[Expert Panel, 2005](#). **Sounding the Alarm on Global Stem Rust** (pdf, 200 KB)

Report of the Expert Panel on the Stem Rust Outbreak in Eastern Africa, May 2005. Background, threat assessment, and control strategies.

News reports:

[Wheat Warning -- New Rust Could Spread Like Wildfire](#), Science News Online, 24 Sep 05

[Global Rust Initiative: Safeguarding the World's Wheat Production](#), CGIAR, 29 Sep 05

[ARS, Cooperators Fight New Strain of Wheat Stem Rust](#), USDA-ARS, 01 Feb 06

Contents of the Publications page

Online Publications

In this page:

- [Reviews, Articles, Monographs](#)
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Reviews, Articles, Monographs

[Catalogue of Gene Symbols for Wheat](#)

By R.A. McIntosh et al.

- 2008 edition, from KOMUGI
 - [Database search](#)
 - [MacGene download](#)
- [2008 edition, data files on GrainGenes](#)
- [1998 edition](#)
- Annual supplements: [1999](#), [2000](#), [2001](#), [2002](#), [2003](#), [2004](#), [2005](#), [2006](#), [2007](#), [2008](#)

[Reserved Laboratory Designators for DNA Clones, Primers and Markers](#)

From Katrien Devos and Jorge Dubcovsky.

[Guidelines for Nomenclature of Biochemical Molecular Loci in Wheat and Related Species](#)

From the *Catalogue of Gene Symbols for Wheat*, 1998.

Portal to barley data



'Boulevard Montmartre at Night'
Camille Pissarro, 1897

Barley Boulevard

A Shortcut to Barley Information in
GrainGenes and Elsewhere

Quick Barley Queries in GrainGenes

GrainGenes Interactive Maps	Barley Markers Derived from Barley	Barley Markers Mapped on Barley	Germplasm
List all barley map sets.	SNPs	Mapped SNPs	All barley germplasm records
	SSRs	Mapped SSRs	Mapping parents
	RFLPs	Mapped RFLPs	

Barley Web Resources

[Barley CAP](#) Barley Coordinated Agricultural Project, USDA-ARS
[BarleyDB](#) full-length cDNAs, ESTs, images from Okayama University

ITMI Website

I·T·M·I

MANAGEMENT OFFICE:
IHRA Clermont-Ferrand
234, Avenue du Brezet
63100 Clermont-Ferrand, France
Tel: 33 4 73 62 46 84
Fax: 33 4 73 62 44 53
Email: catherine.feuillet@clermont.inra.fr

International • Triticeae • Mapping •
Initiative

Next ITMI Summer Workshop: [Clermont-Ferrand, Aug 31 - Sep 4, 2009](#)

About ITMI

- [Objectives, coordination areas, and Coordinators](#)
- **Triticeae Genomics Vision** - [Towards coordinating genomics efforts in wheat and barley](#)
Views from the ITMI Management group, Feb 2006
- **The International Triticeae Mapping Initiative: 15 Years of Evolution**
Presentation by Mark Sorrells to the International Cotton Genome Initiative, PAG-XIII, Jan 2005
 - [Abstract](#)
 - [Powerpoint presentation](#)
- [A brief history](#)

Previous ITMI workshops

- [Report, Business meeting](#), IWGSC Brisbane, August 2008 *New, January 2009*
- [Presentations from the January 2008 Workshop](#), PAG-XVI, San Diego CA

Triticeae Annotation Working Group

<i>International Wheat Genome Sequencing Consortium</i>	
Main Menu	Triticeae Annotation Working Group
Home	Welcome annotators!!
Document Center	To deposit and share your annotation files, click Document Center in the menu. You can organize the directory however you want to. I've added a few sample folders and files. You can delete, rename, add more etc.
Login	
Username: <input type="text" value="tawg"/>	Adding files is only allowed for users who are logged in as "tawg". Contact me for the password.
Password: <input type="password" value="*****"/>	- Dave Matthews, matthews@greengenes.cit.cornell.edu
<input type="button" value="User Login"/>	
Register now!	
Lost Password?	
	Links
	The TriAnnotPipeline, INRA
	Triticeae Large-insert Libraries (Jorge Dubcovsky's list)
	Nomenclature of BAC clones and libraries The nomenclature proposed in April 2007, from the the PAG 2007 workshop.
	Registry of BAC library names Please submit your libraries to this database!
	International Wheat Genome Sequencing Consortium

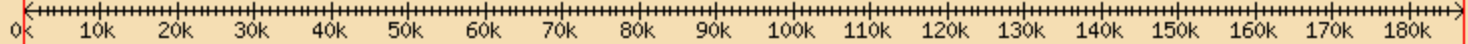
www.tritgenome.org/tawg

password: angela

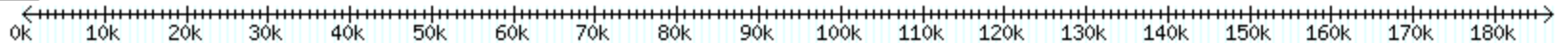
GBrowse display

Overview

Overview of AY663391



Details



Annotated Genes

gene:ACT-1
←

gene:RGA2
←

gene:RGA1
→
synonym: Lr1

Transcripts

gene:ACT-1
←
actin

gene:RGA2
←
putative resistance protein
mRNA:GenBank:AY663391:30210:33458
putative chromosome condensation factor

gene:RGA1
→
putative res

Coding Regions

mRNA:ACT-1.t01
←
actin

mRNA:RGA2.t01
←
putative resistance protein

AAW78912.1
→
putative chromosome condensation factor

mRNA:RGA1.t01
→
putative res

tRNAs

Annotated Repeats

repeat_region:GenBank:AY663391:3801:14042

class I, LTR retrotransposon, copia-like, Angela_AY663391-1

repeat_region:GenBank:AY663391:92079:92639

class I, LTR retrotransposon, athila-like, Sabrina_AY663391-1 foldback

repeat_region:GenBank:AY663391:47495:47578

foldback element, stowaway, MITE, Athos_AY663391-1

repeat_region:GenBank:AY663391:128054:129763

class I, LTR retrotransposon, athila-like, Sabr

repeat_region:GenBank:AY663391:50462:53245

class I, LTR retrotransposon, copia-like, Angela_AY663391-3

repeat_region:GenBank:AY663391:1437

class I, LTR retrotransposon, athil

repeat_region:GenBank:AY663391:53251:58759

class I, LTR retrotransposon, copia-like, Angela_AY663391-4

repeat_region:GenBank:AY6633

class I, LTR retrotransposon

repeat_region:GenBank:AY663391:53779:54366

class I, LTR retrotransposon, copia-like, Angela_AY663391-5

repeat_region:GenBank:AY

class I, LTR retrotransp

repeat_region:GenBank:AY663391:58765:63139

class I, LTR retrotransposon, copia-like, Angela_AY663391-6

repeat_region:G

class I, LTR re

repeat_region:GenBank:AY663391:63140:87089

repeat_

Map Summary

Interactive Maps on GrainGenes

The Short List to explore first!

[The Complete List](#)

Link	Map_Data Name	Date	Parent	Parent	Markers # Type
	Wheat Maps - Diploid				
Link	T. boeoticum x monococcum	2007	T. boeoticum pau5088	T. monococcum pau14087	190 EST, SSR
Link	T. monococcum, DV92 x G3116	1996	T. monococcum ssp. monococcum DV92	T. monococcum ssp. aegilopoides G3116	357 RFLP
Link	T. tauschii	1991	Triticum tauschii TA1691	Triticum tauschii TA1704	291 RFLP
	Wheat Maps - Tetraploid				
Link	Durum wheat, Kofa x UC1113	2008	Kofa	UC1113	269 QTL, SSR, SNP
Link	T. turgidum, JK x Cham1, 2	2001	Jannah Khetifa (Tamgurt)	Cham1 IC71	470 AFLP, RFLP, SSR
Link	T. turgidum, Messapia x dicoccoides, SSR	1999	MESSAPIA	MG4343	294 RFLP, SSR
Link	T. turgidum, Omrabi5 x dicoccoides, QTL	2004	Omrabi5	T. dicoccoides 600545	295 QTL, AFLP, SSR
	Wheat Maps - Hexaploid				
Link	3B Physical	2008	Composite, 13 mapping studies		849 SSR, STS, DaRT
Link	Wheat, Arina x Forno	2003	Forno	Arina	401 SSR, RFLP
Link	Wheat, Chinese Spring x SQ1	2005	Chinese Spring	SQ1	640 SSR, RFLP, AFLP
Link	Wheat, Composite, 2004	2004	Composite, 11 mapping studies		3741 RFLP, SSR, AFLP,
Link	Wheat, Consensus SSR, 2004	2004	Composite, 4 mapping studies		1249 SSR, Genes
Link	Wheat, Gale	1995	Consensus		1028 Genes, RFLP
Link	Wheat genes	1992	Consensus		157 Genes

3B physical map

GrainGenes Map Data Report: 3B Physical

[[Printable Version](#)] [[Submit comment/correction](#)]


Map Data 3B Physical

Map [Physical-3B](#)

Species [Triticum aestivum](#)

Type Genetic
Physical

Map Units cM

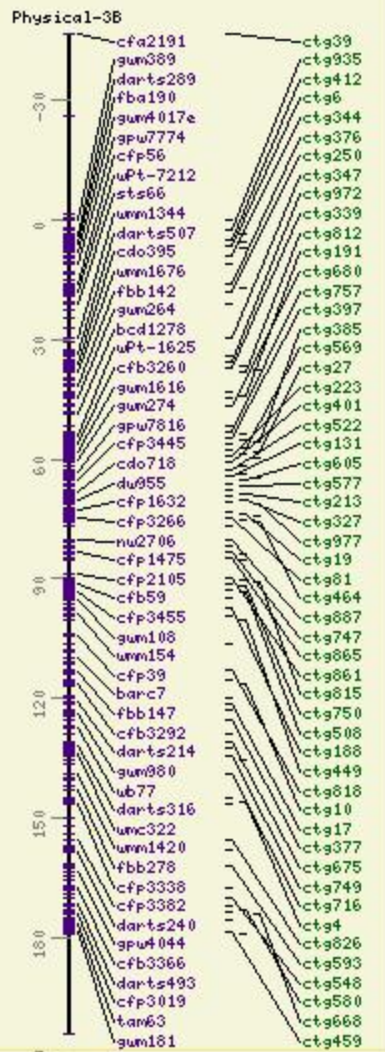
Reference  [Paux E et al. \(2008\) A Physical Map of the 1-Gigabase Bread Wheat Chromosome 3B](#) *Science* 322:101-104.

Contact [Feuillet, Catherine](#)

Remarks The genetic map was integrated from thirteen mapping populations.

Locus [abc174](#)
[[Show all 849](#)]

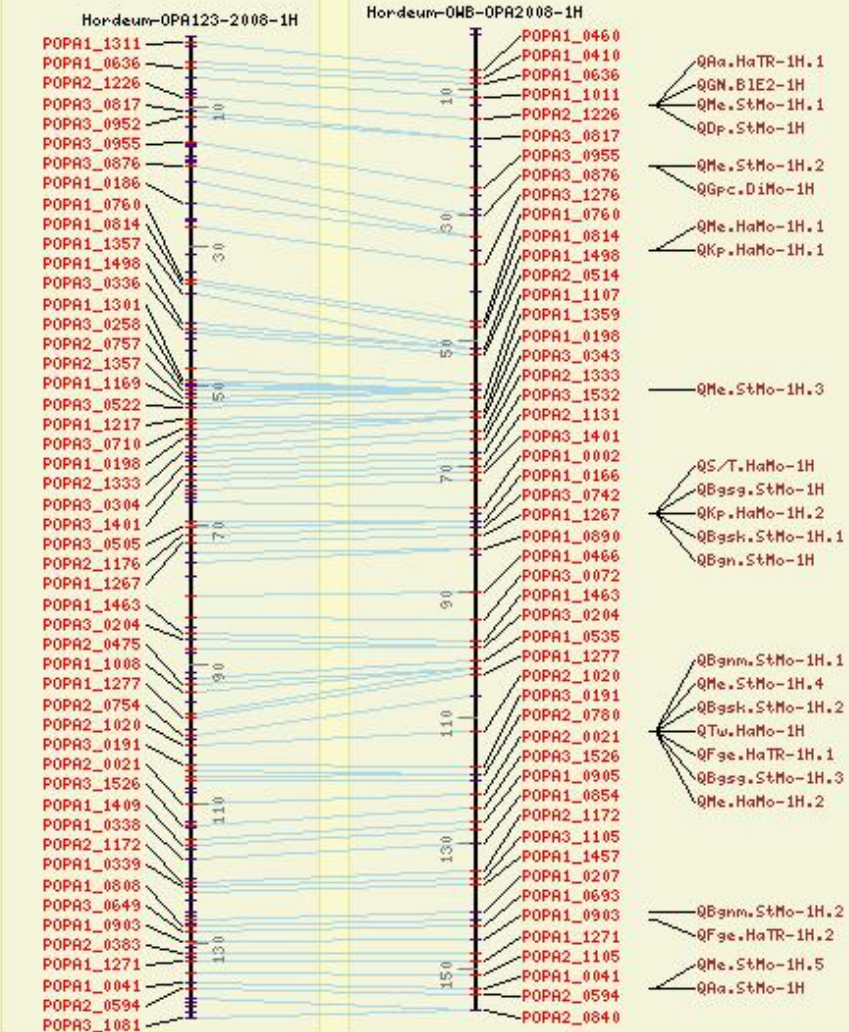
Reference
3B Physical



3B physical map

Comparative
Barley, OPA123-2008, Consensus

Reference
Barley, OMB, OPA2008



Feature Types:

— locus

■ qtl

Features in red have correspondences

Evidence Types:

Lightblue line denotes Automated name-based

Comparing two maps

Quick Queries for markers

Quick Queries

Expedited access to GrainGenes' most Frequently Asked Queries.
If you have a GrainGenes question you want to ask, please let me know.
Somebody else probably has the same question.

- Dave, matthews@greengenes.cit.cornell.edu

Categories

- [Microsatellites and STS's](#)
- [Markers and Mapped Genes](#)
- [Mapped Sequences](#)
- [Sequences](#)
- [QTLs](#)
- [Genes](#)
- [Polymorphisms](#)
- [References](#)
- [Address Book](#)
- [Germplasm](#)

Microsatellites and STS's

- **SSR primers and corresponding mapped loci.**

Improvements suggested by Christie Williams, Simon Berry and Tim Langdon.

CFE* SSR set (* for all)

Primers

Map locations on chromosome (* for all)

Mapping data: segregation scores for these SSRs in all populations for which we have the data.

Quick Queries for markers

Premade Queries: -- select one --

SQL query:

```
-- Microsatellite (SSR) Primers
select
  distinct
  probe.name as SSR,
  pr.primeronesequence as Primer_1,
  pr.primertwosequence as Primer_2,
```

Submit

Schema: [Diagrams](#) | [Table definitions](#)

download text

[TOP | <<250 | <<25 | 1 - 25 of 301 | >>25 | >>250 | BOTTOM]

Showing records 1 through 25 of 301 records

SSR	Primer_1	Primer_2	Conditions	SSR_Size
CFE1	Left CGTGACGAGCATGAGCAC	Right GACAGGAGGGGAAGAAATC	Annealing temperature 60	150 theoretical; 165 observed
CFE10	Left TCGCGTAGTCCATGCAGTC	Right ATGGCTATCTATAAACACCGGC	Annealing temperature 60	324 theoretical; 315, 326, 341 observed
CFE100	Left GCAGTCTTCCAGTTCAGAGG	Right AGGGACAACAGTTACGTGGC	Annealing temperature 60	234 theoretical; 249, 254, 271 observed
CFE101	Left GAACATGCAAGACACGAGTAGC	Right TACTTCAGCCAGGGCCAG	Annealing temperature 60	286 theoretical; 135, 175 observed

“grains” mailgroup

Greetings!

Welcome to the mailgroup "grains", a forum for open discussion and announcements related to the International Triticeae Mapping Initiative.

Topics of interest:

- Genome mapping of wheat, barley, oats, rye, sugarcane, and related species
- GrainGenes, the Triticeae Genome Database
- Anything else you might want to say to this particular group of people in a public place

WHAT IS A MAILGROUP?

A mailgroup is a bulletin board that is implemented via electronic mail. To post a message to everyone in the group, you simply mail it to the following address:

`grains@greengenes.cit.cornell.edu`

The message is then automatically forwarded in a few minutes to every member of the group. That's all there is to it. The complete list of members is given below.

JOINING, UNJOINING, AND PUBLISHING YOUR ADDRESS INFORMATION

I have volunteered to administer the mailgroup. Anyone can request to be added to the group or removed from it at any time by contacting me, at:

`matthews@greengenes.cit.cornell.edu`

The Hordeum Toolbox

The Hordeum Toolbox

[Home](#)[Lines](#)[Phenotypes](#)[Genotypes](#)[Expression](#)

Quick Links

[Home](#)[Login/Register](#)[Search Data](#)[Download For Tassel](#)[Flapjack Download](#)

Advanced Search

Home

Welcome to 'The Hordeum Toolbox' (THT).

'The Hordeum Toolbox' (THT) is the webportal for the data generated by the Barley Coordinated Agricultural Project (CAP) is funded by the Cooperative State Research, Education, and Extension Service (CSREES) of the United States Department of Agriculture (USDA). THT contains SNP, pedigree, and phenotypic data from breeding germplasm in the Barley CAP. As a community resource, THT will integrate rapidly expanding SNP data sets with traditional phenotypic data, structural genomics, and gene expression profile data sets available from PLEXdb. The underlying premise is that these molecular level phenotypes manifest as traits that plant breeders select for.

Search Type

Example Search Term

Search By Breeding Program

Select a breeding program from the list to see all datasets containing data from program's lines.

Search By Year

Select an experiment year to see all experiment data from that year.

Barley CAP project

- 960 barley lines
- 1536 SNP markers
- 30 traits
- Starting year 4 of 4

The Hordeum Toolbox

- Phenotype, genotype and pedigree data
- For association mapping
- Extract datasets for analytical software
 - TASSEL
 - Flapjack
- Creator Julie Dickerson, Iowa State U.
- Curator Jennifer Kling, Oregon State U.

The Hordeum Toolbox

Expt12_2006_Carrington

Location (Latitude/Longitude)	Carrington, ND
Planting Date	19 April 2006
Harvest Date	
Seeding Rate	2.47 million seed/ha
Experiment Design	6x6 square lattice
Plot Size	35 sq ft
Harvest Area	35 sq ft
Irrigation	yes
Number of Replications	3
Comments	None

1-34 / 34

Line Name	BP Code	Grain Yield (kg ha ⁻¹)	Plant Height (centimeter)	Heading Date (days from planting)	Lodging (percent)	Plump Grain (% by wt on 6/64" sieve)	Grain Protein (kg ha ⁻¹)	Kernel Weight (milligram)	Barley Color (° asbc)	Malt Extract (percent)	Wort Color (asbc)	Wort Protein (percent)
ND20798-12	N2	5,310.06	45.1	58	16.00	92.4	13.97	41.18	29.0	78.05	2.38	5.77
ND21089-3	N2	4,250.20	43.9	56	16.00	89.6	14.54	41.18	30.0	78.95	2.54	6.28
ND21863-2	N2	5,277.78	53.2	61	27.00	90.3	13.70	42.01	33.0	79.20	2.05	5.42
ND21865-6	N2	5,729.70	54.1	63	23.00	90.5	13.26	43.60	30.0	80.11	2.40	5.97

Acknowledgments

- Curators
 - Dave Matthews
 - Victoria Blake
 - Gerry Lazo
- Programmers
 - Dave Hane
 - John Lee
- Director
 - Olin Anderson