

TAIR User Interface

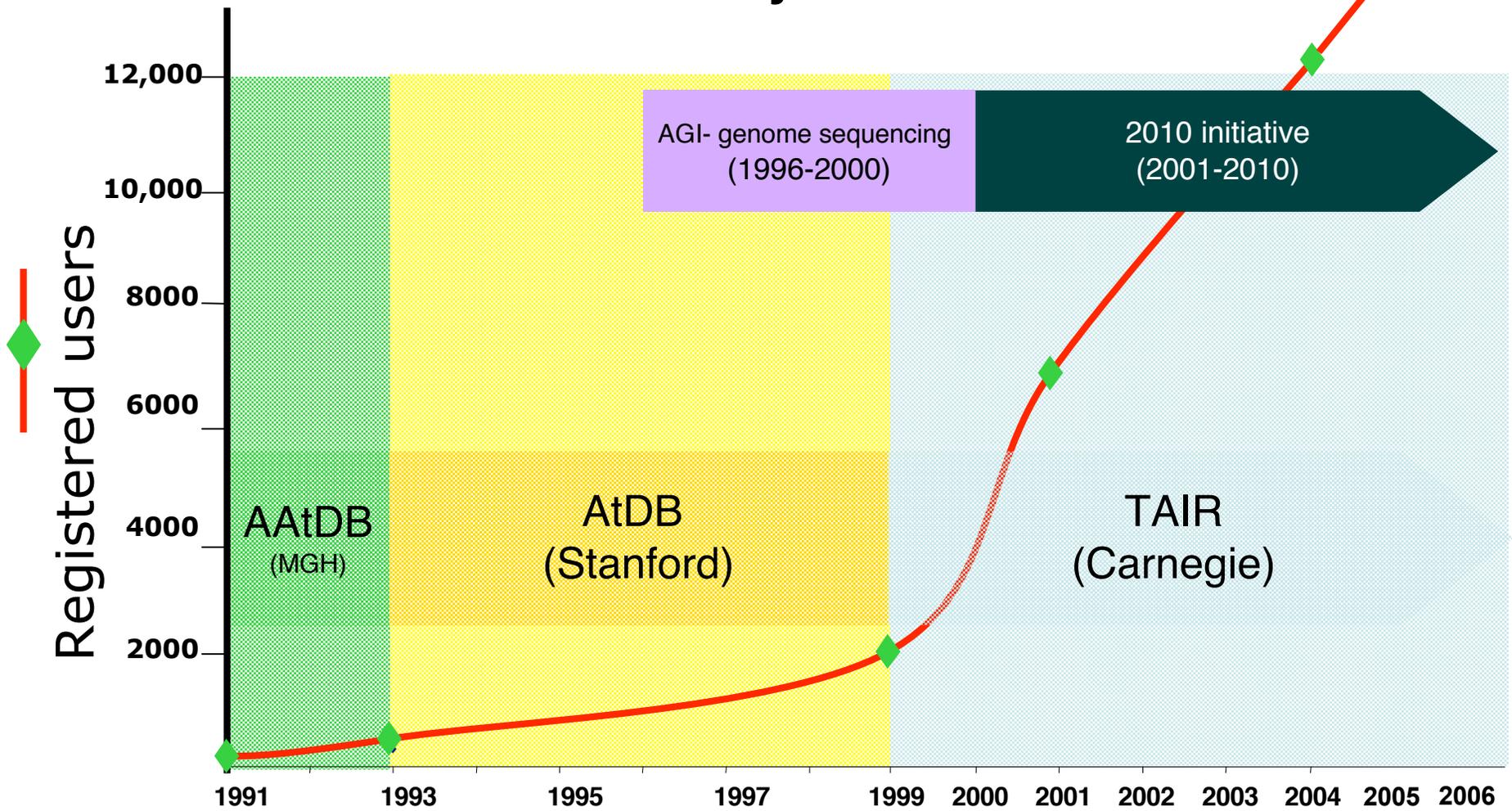
MOD User Interface Caucus

Talk outline

- TAIR intro
 - The Arabidopsis Information Resource
- 2 lessons learned
- Measuring usability
- TAIR interface examples



A Brief History of the Arabidopsis Community Database



As of Aug 28 2006, 15,627 registered users.

Two lessons learned

- When designing a web interface:
 - How to use it must be obvious
 - It must function as expected



Obviousness

- 1999 AtDB search



Arabidopsis thaliana Database

[AtDB Search Options](#)
Search AtDB's Database and web pages (includes newsgroup and other archives).

[Illustra Database](#)
[Home](#)
Access the AtDB database proper: AGI, maps, colleagues, clones, and papers

Welcome to the AtDB Project

The *Arabidopsis thaliana* Database (AtDB) Project provides genomic and related data about Arabidopsis.

If you're not sure where the information you're looking for may be, either start at AtDB's [Search](#) Page or click in one of the categories displayed on the left. This will display links to pertinent information: in AtDB's Illustra database, on AtDB's web pages, or from external resources. [More details](#).

Obviousness

- 1999 AtDB search
 - No box to enter a search term



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 - 4 places to click

AtDB *Arabidopsis thaliana* Database

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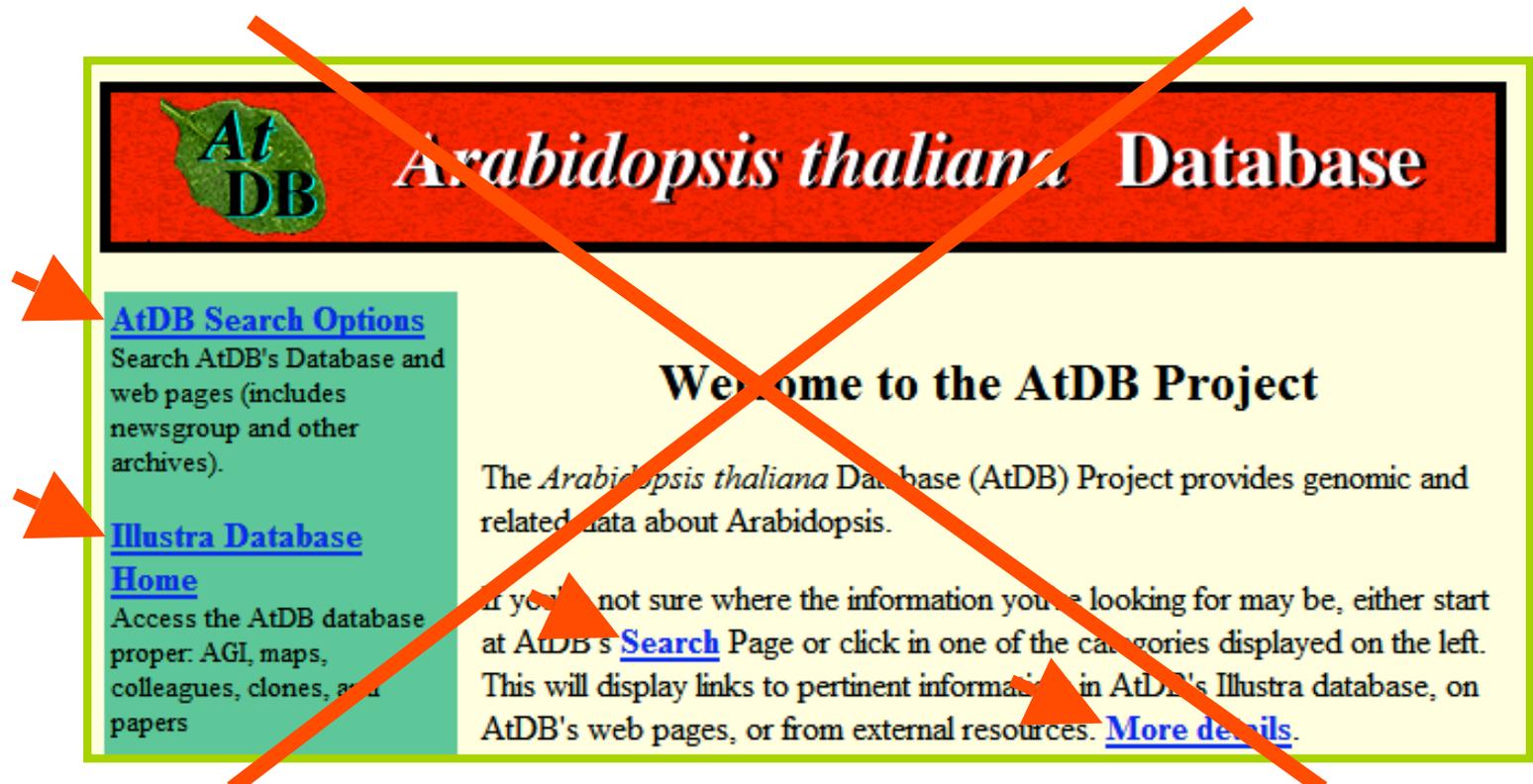
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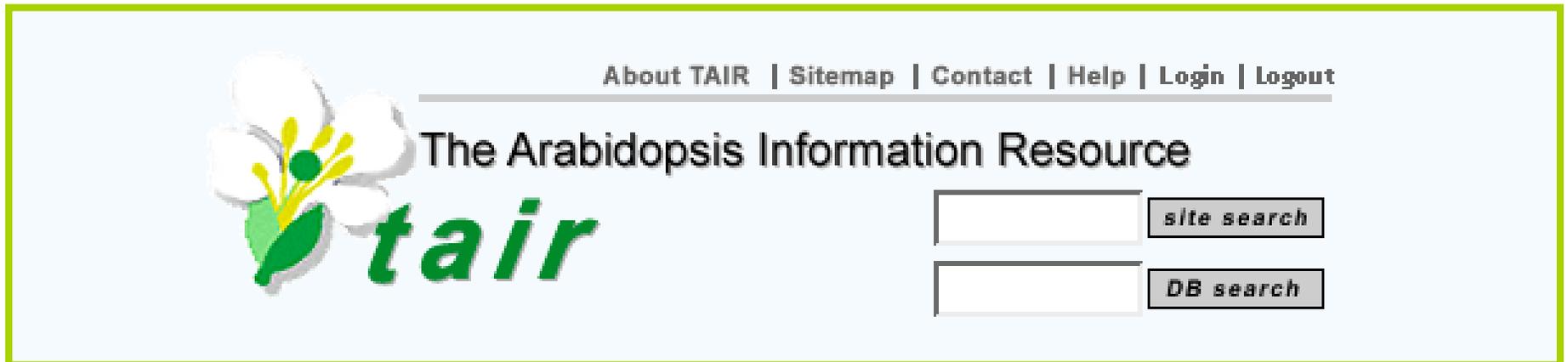
Obviousness

- 1999 AtDB search
 - No box to enter a search term
 - 4 places to click



Expectations vs. results

- 2001 TAIR search



The screenshot shows the header of the TAIR website. At the top right, there is a navigation menu with links: [About TAIR](#) | [Sitemap](#) | [Contact](#) | [Help](#) | [Login](#) | [Logout](#). Below this menu is a horizontal line. On the left side, there is a logo featuring a white flower with a green stem and leaves, and the word "tair" in a green, lowercase, sans-serif font. To the right of the logo, the text "The Arabidopsis Information Resource" is displayed in a black, sans-serif font. Below the text, there are two search input fields. The top field is followed by a button labeled "site search". The bottom field is followed by a button labeled "DB search".

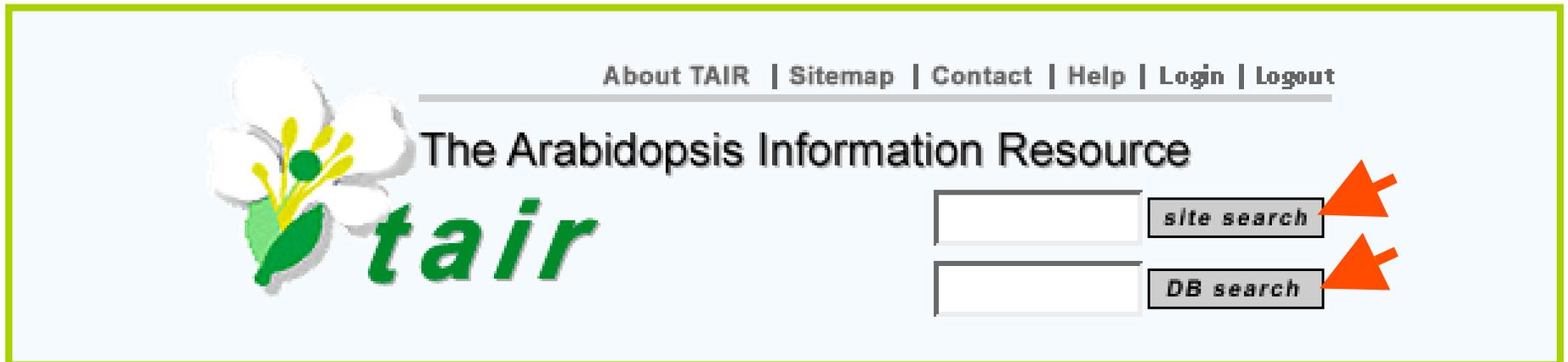
About TAIR | Sitemap | Contact | Help | Login | Logout

The Arabidopsis Information Resource

tair

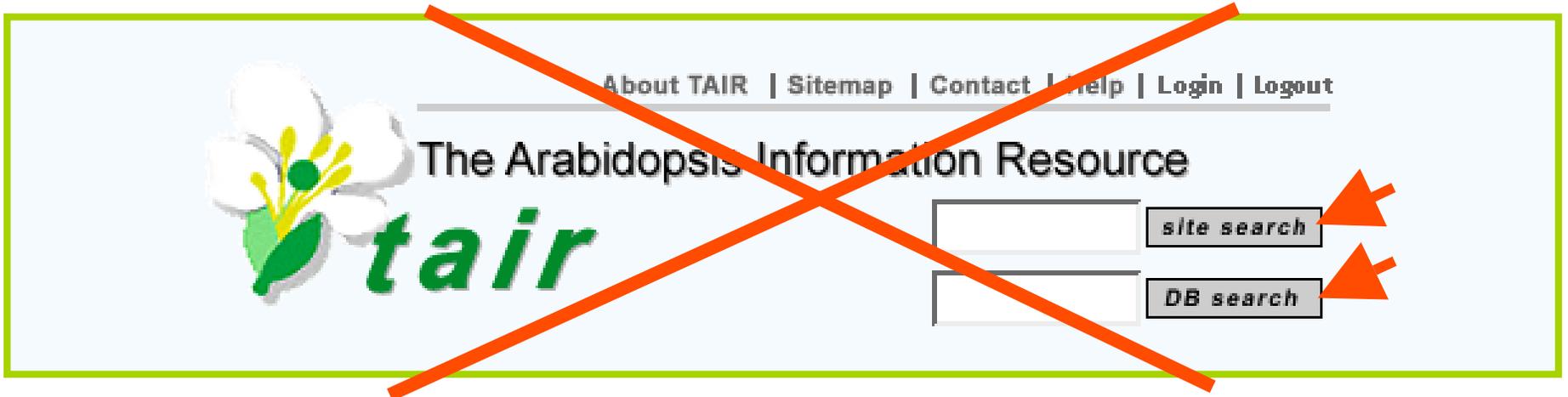
Expectations vs. results

- 2001 TAIR search
 - Why are there two search boxes?



Expectations vs. results

- 2001 TAIR search
 - Why are there two search boxes?



Expectations vs. results

- 2003 TAIR search



[About TAIR](#) | [Sitemap](#) | [Contact](#) | [Help](#) | [Order](#) | [Login](#) | [Logout](#)

tair The Arabidopsis Information Resource

TAIR Database 

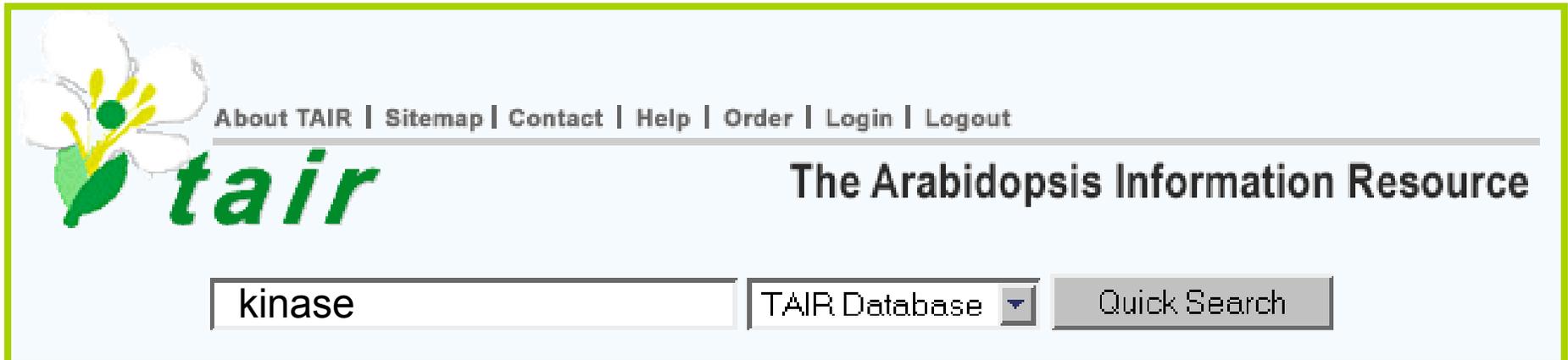
Expectations vs. results

- 2003 TAIR search
 - Function is unclear
 - What objects can I search for?
 - “Exact” or “contains” searching?
 - Just names, or also descriptions?



Expectations vs. results

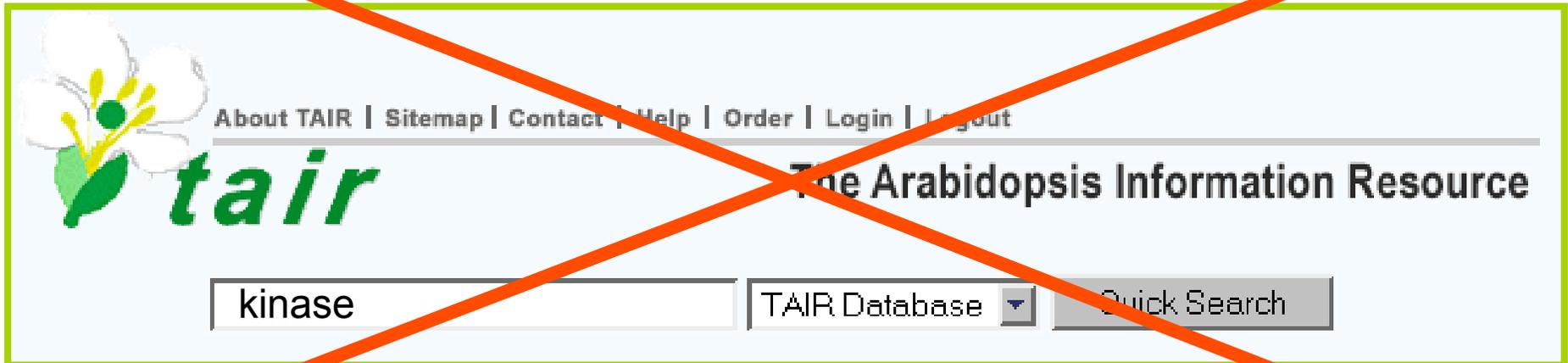
- 2003 TAIR search
 - Function is unclear
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Will this search for any object in the database containing “kinase”? **No.**

Expectations vs. results

- 2003 TAIR search
 - Function is unclear
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Will this search for any object in the database containing “kinase”? **No.**

Expectations vs. results

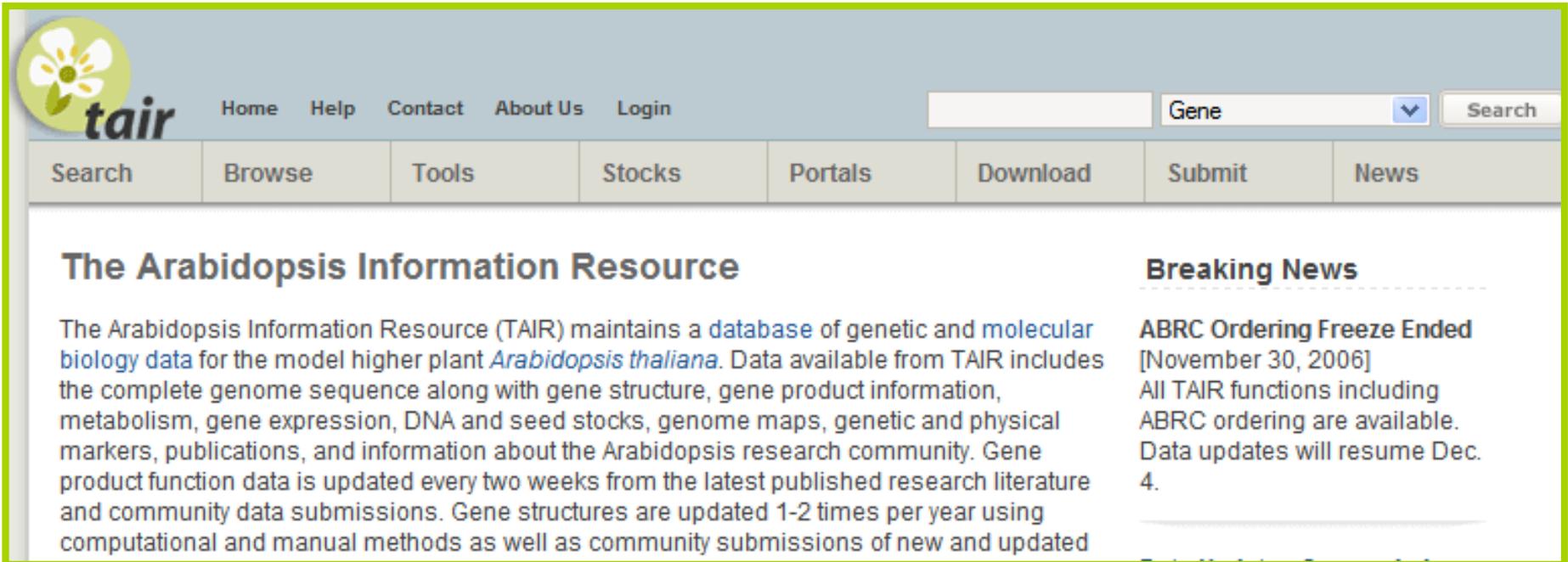
- How can we match expectations to results?
 - Alter results to fix expectations?
 - Alter expectations to fit results?

Expectations vs. results

- How can we match expectations to results?
 - Alter results to fix expectations?
 - Alter expectations to fit results?
 - A bit of both?

Expectations vs. results

- 2006 TAIR search
 - Use is obvious
 - Expectations are clearer
 - Functions as expected by most users



The screenshot shows the TAIR website interface. At the top left is the TAIR logo, a stylized flower. To its right are navigation links: Home, Help, Contact, About Us, and Login. A search bar is located to the right of these links, with the word "Gene" entered and a search button. Below the navigation and search bar is a horizontal menu with buttons for Search, Browse, Tools, Stocks, Portals, Download, Submit, and News. The main content area is divided into two columns. The left column is titled "The Arabidopsis Information Resource" and contains a paragraph of text describing the database. The right column is titled "Breaking News" and contains a news item about the ABRC ordering freeze ending.

The Arabidopsis Information Resource

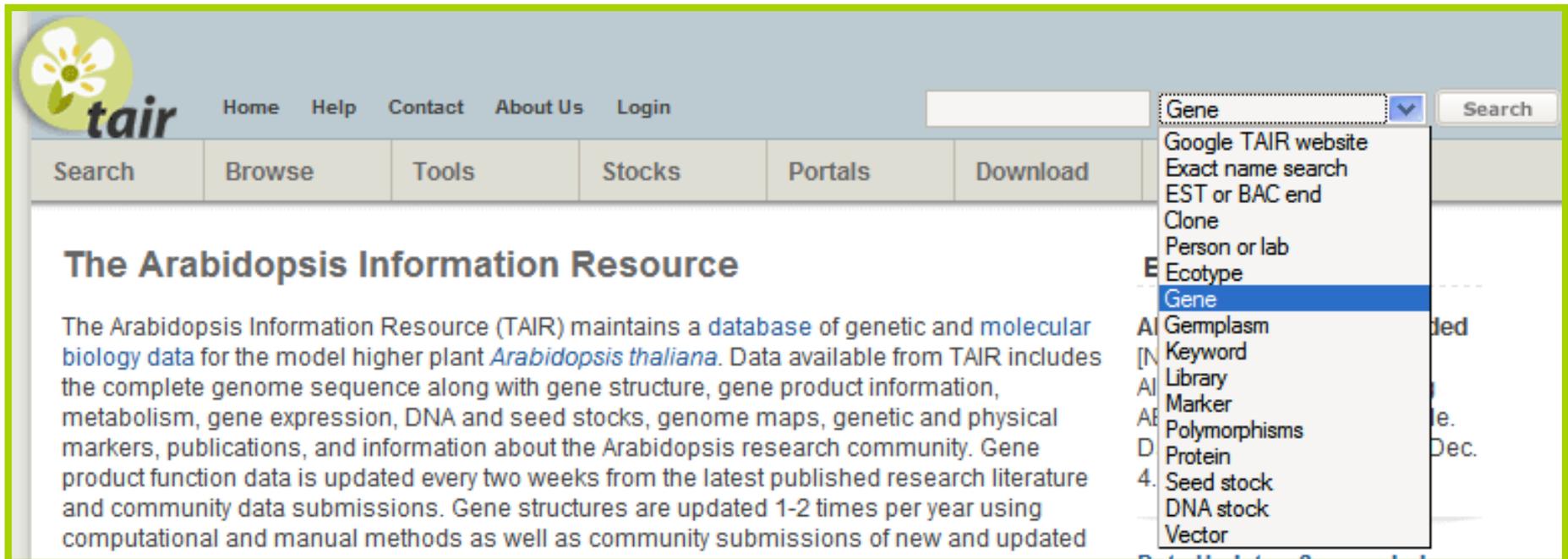
The Arabidopsis Information Resource (TAIR) maintains a [database](#) of genetic and [molecular biology data](#) for the model higher plant *Arabidopsis thaliana*. Data available from TAIR includes the complete genome sequence along with gene structure, gene product information, metabolism, gene expression, DNA and seed stocks, genome maps, genetic and physical markers, publications, and information about the Arabidopsis research community. Gene product function data is updated every two weeks from the latest published research literature and community data submissions. Gene structures are updated 1-2 times per year using computational and manual methods as well as community submissions of new and updated

Breaking News

ABRC Ordering Freeze Ended
[November 30, 2006]
All TAIR functions including ABRC ordering are available. Data updates will resume Dec. 4.

Expectations vs. results

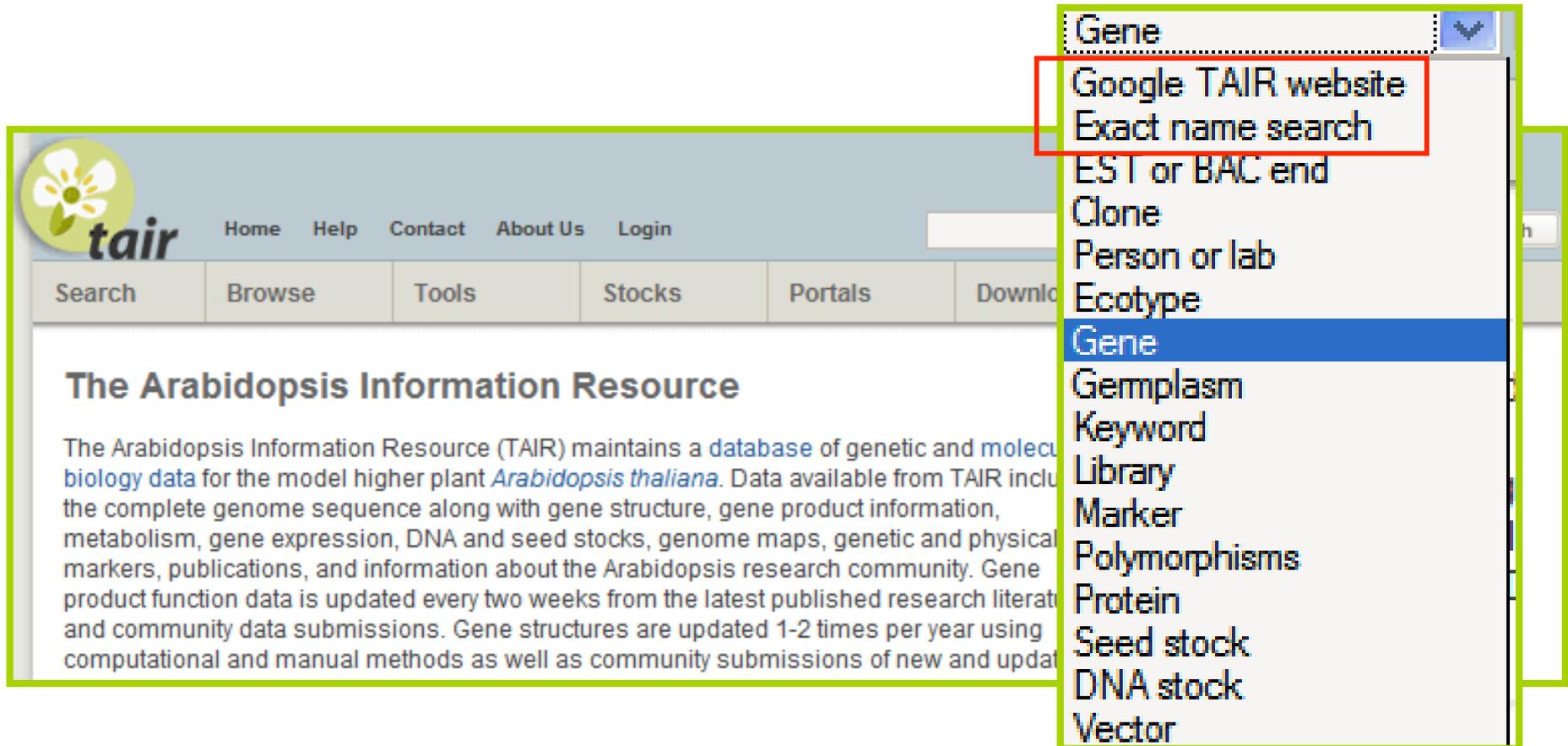
- 2006 TAIR search
 - Searches Gene by default
 - BUT other searches are still accessible



The screenshot shows the TAIR (The Arabidopsis Information Resource) website. The top navigation bar includes the TAIR logo, a search input field, and a dropdown menu currently set to "Gene". Below the navigation bar are several tabs: Search, Browse, Tools, Stocks, Portals, and Download. The main content area features the title "The Arabidopsis Information Resource" and a paragraph of introductory text. The search dropdown menu is open, displaying a list of search options: Gene (highlighted), Ecotype, Gemplasm, Keyword, Library, Marker, Polymorphisms, Protein, Seed stock, DNA stock, and Vector. The "Gene" option is selected, indicating that the default search is for genes.

Expectations vs. results

- 2006 TAIR search
 - Searches Gene by default
 - BUT other searches are still accessible



The screenshot shows the TAIR website interface. At the top left is the TAIR logo, a stylized flower. To its right are navigation links: Home, Help, Contact, About Us, and Login. Below these is a search bar. A dropdown menu is open from the search bar, listing various search options. The 'Gene' option is highlighted in blue. A red box highlights the 'Google TAIR website Exact name search' option. Below the search bar are tabs for Search, Browse, Tools, Stocks, Portals, and Downloads. The main content area is titled 'The Arabidopsis Information Resource' and contains a paragraph of text describing the resource.

Gene

Google TAIR website
Exact name search

EST or BAC end

Clone

Person or lab

Ecotype

Gene

Gemplasm

Keyword

Library

Marker

Polymorphisms

Protein

Seed stock

DNA stock

Vector

Home Help Contact About Us Login

Search Browse Tools Stocks Portals Downloads

The Arabidopsis Information Resource

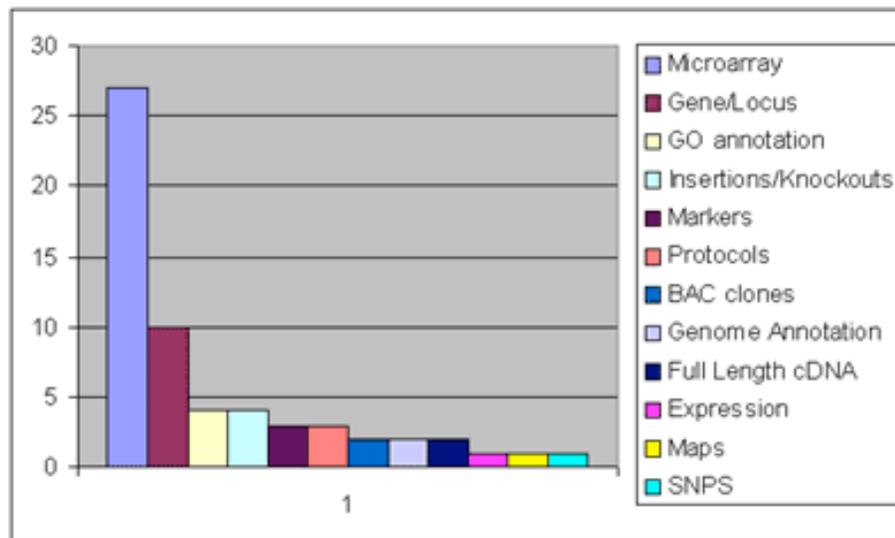
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Measuring usability

- Community feedback
 - Email questions
 - Workshops
 - Surveys
- Site logging
- Live usability tests

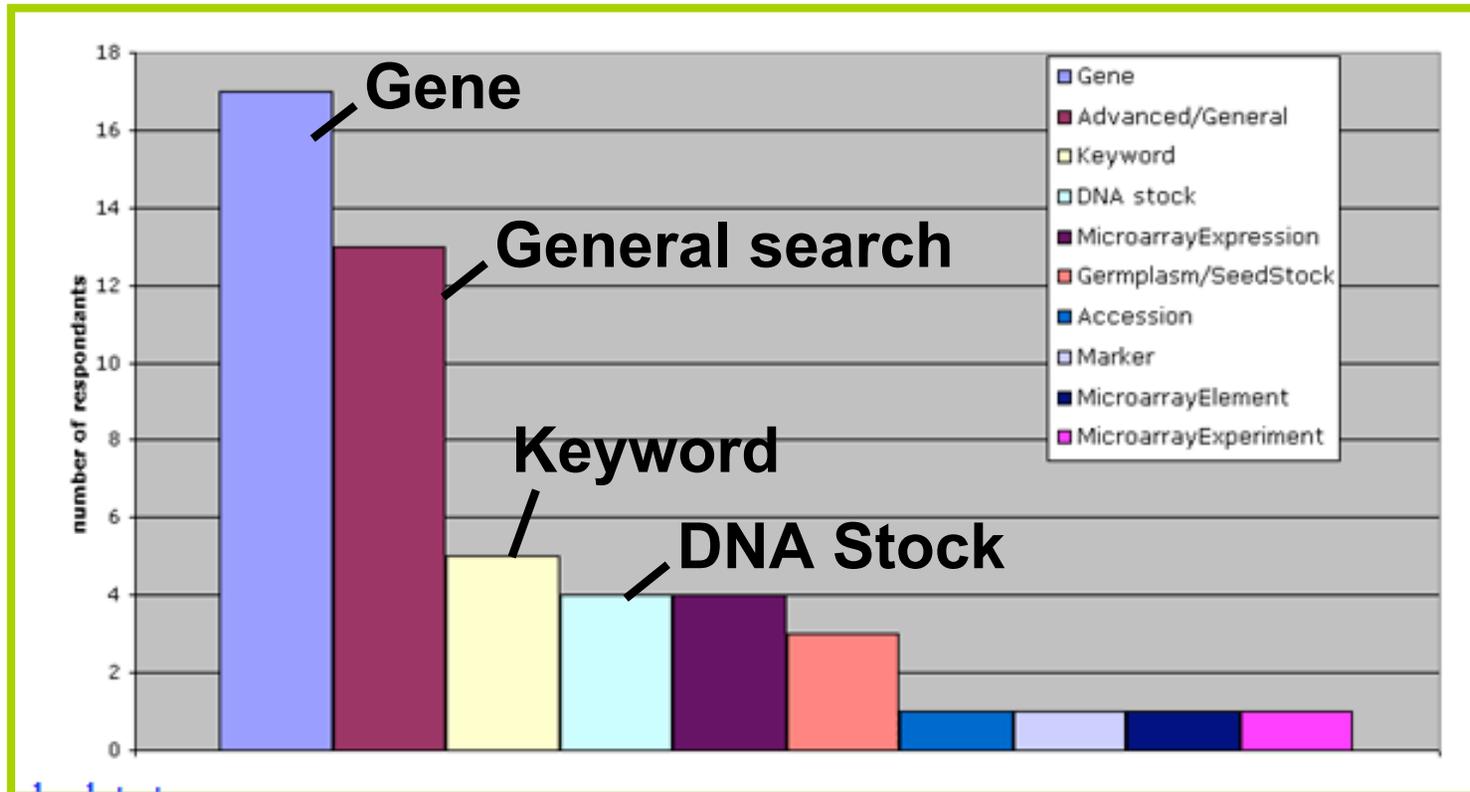
Surveys

Question 3 Results (What tools/searches/information do you find most difficult to use at TAIR and why?)



- Microarray
- Gene/Locus
- GO annotation
- Insertions/Knockouts
- Markers
- Protocols
- BAC clones
- Genome Annotation
- Full Length cDNA
- Expression
- Maps
- SNPS

Surveys



Which searches give the most trouble?

Site Logging

- Log query strings with 0 results
- Eliminate misspellings, objects not stored
- Why did remainder fail?
 - Requires 'contained in' search
 - Requires separate matching of each word
 - General concept not associated to object

GMOD interface topics

- Gene search
- Locus/gene page
- Search for gene by phenotype or GO annotation
- Custom report on some aspect of gene
- Bulk output based on a query
- Combine results with info from other data sources



Home Help Contact About Us Login

Gene Search

Search Browse Tools Stocks Portals Download Submit News

Locus: AT1G01140

Date last modified 2003-05-02

TAIR Accession Locus:2035367

Representative Gene Model [?](#) **AT1G01140.1**

Other names: CBL-INTERACTING PROTEIN KINASE 9, CIPK9, F6F3.28, PKS6

Other Gene Models ?	Name	Description	Source	Date
	CIPK9	Encodes a CBL-interacting protein kinase with similarity to SOS2	GenBank	2001-03-08
	AT1G01140.2 (splice variant)	CBL-interacting protein kinase 9 (CIPK9), identical to CBL-interacting protein kinase 9 (Arabidopsis thaliana) gi 13249117 gb AAK16684; contains Pfam profiles PF00069: Protein kinase domain and PF03822: NAF domain; identical to cDNA CBL-interacting protein kinase 9 (CIPK9) GI:13249116	GenBank	2001-08-22
	AT1G01140.3 (splice variant)	CBL-interacting protein kinase 9 (CIPK9), identical to CBL-interacting protein kinase 9 (Arabidopsis thaliana) gi 13249117 gb AAK16684; contains Pfam profiles PF00069: Protein kinase domain and PF03822: NAF domain; identical to cDNA CBL-interacting protein kinase 9 (CIPK9) GI:13249116	AGI-TIGR	2003-05-02

Annotations ?	Category	Relationship Type ?	Keyword ?
	GO Biological Process	involved in	protein amino acid phosphorylation , signal transduction
	GO Cellular Component	located in	mitochondrion
	GO Molecular Function	none	kinase activity

[Annotation Detail](#)

RNA Data

One-channel Arrays	array element name ?	avg. signal intensity (std. error)	avg. signal percentile (std. error)
	261581_AT	449.449 (10.681)	72.104 (0.823)

Associated Transcripts ?	type	number associated
	EST	(43)
	cDNA	(5)

Description [?](#) CBL-interacting protein kinase 9 (CIPK9), identical to CBL-interacting protein kinase 9 (Arabidopsis thaliana) gi|13249117|gb|AAK16684; contains Pfam profiles PF00069: Protein kinase domain and PF03822: NAF domain; identical to cDNA CBL-interacting protein kinase 9 (CIPK9) GI:13249116

Chromosome 1

Nucleotide Sequence [?](#) [full length CDS](#) [full length cDNA](#) [full length genomic](#)

Gene Page

Other names
 Splice variants
 GO annotations
 Expression
 Description
 Sequences

And.....

Locus: AT1G01140

Date last modified 2003-05-02

TAIR Accession Locus:2035367

Representative Gene Model [AT1G01140.1](#)

Other names: CBL-INTERACT

Other Gene Models [Name](#)

[CIPK9](#)

[AT1G01140.2](#)
(splice variant)

[AT1G01140.3](#)
(splice variant)

Annotations [Category](#)

- GO Biological P
- GO Cellular Co
- GO Molecular F

RNA Data

One-channel Arrays [array element name](#)
[261581_AT](#)

Associated Transcripts [type](#)
EST
cDNA

Description [CBL-interacting gi|13249117|gb| identical to cDN](#)

Chromosome 1

Nucleotide Sequence [full length CDS](#)

Protein Data [?](#)

name	Length(aa)	molecular weight	isoelectric point	domains(# of domains)
AT1G01140.1	448	50505.0	8.5162	Protein kinase:IPR000719(3) Serine/threonine protein kinase, active site:IPR008271(1) NAF domain:IPR004041(1) Serine/threonine protein kinase:IPR002290(1) Tyrosine protein kinase:IPR001245(1)

Map Locations [?](#)

chrom	map	map type ?	coordinates	orientation	attrib
1	AGI	nuc_sequence	64167 - 67625 bp	reverse	details
1	T25K16	assembly_unit	63723 - 67181 bp	reverse	

Map Links [?](#) [Map Viewer](#) [Sequence Viewer](#)

Gene Feature [?](#)

type	coordinates	annotation source	date
ORF	114-3228		
5' utr	1-113		
coding_region	114-302		
coding_region	729-791		
coding_region	877-948		
coding_region	1069-1176		
coding_region	1284-1364		
coding_region	1466-1519		
coding_region	1762-1887		
coding_region	1974-2063		
coding_region	2170-2295		
coding_region	2409-2516		
coding_region	2609-2725		
coding_region	2819-2875		
coding_region	2970-3044		
coding_region	3151-3228		
exon	1-302		
intron	303-728		
exon	729-791		

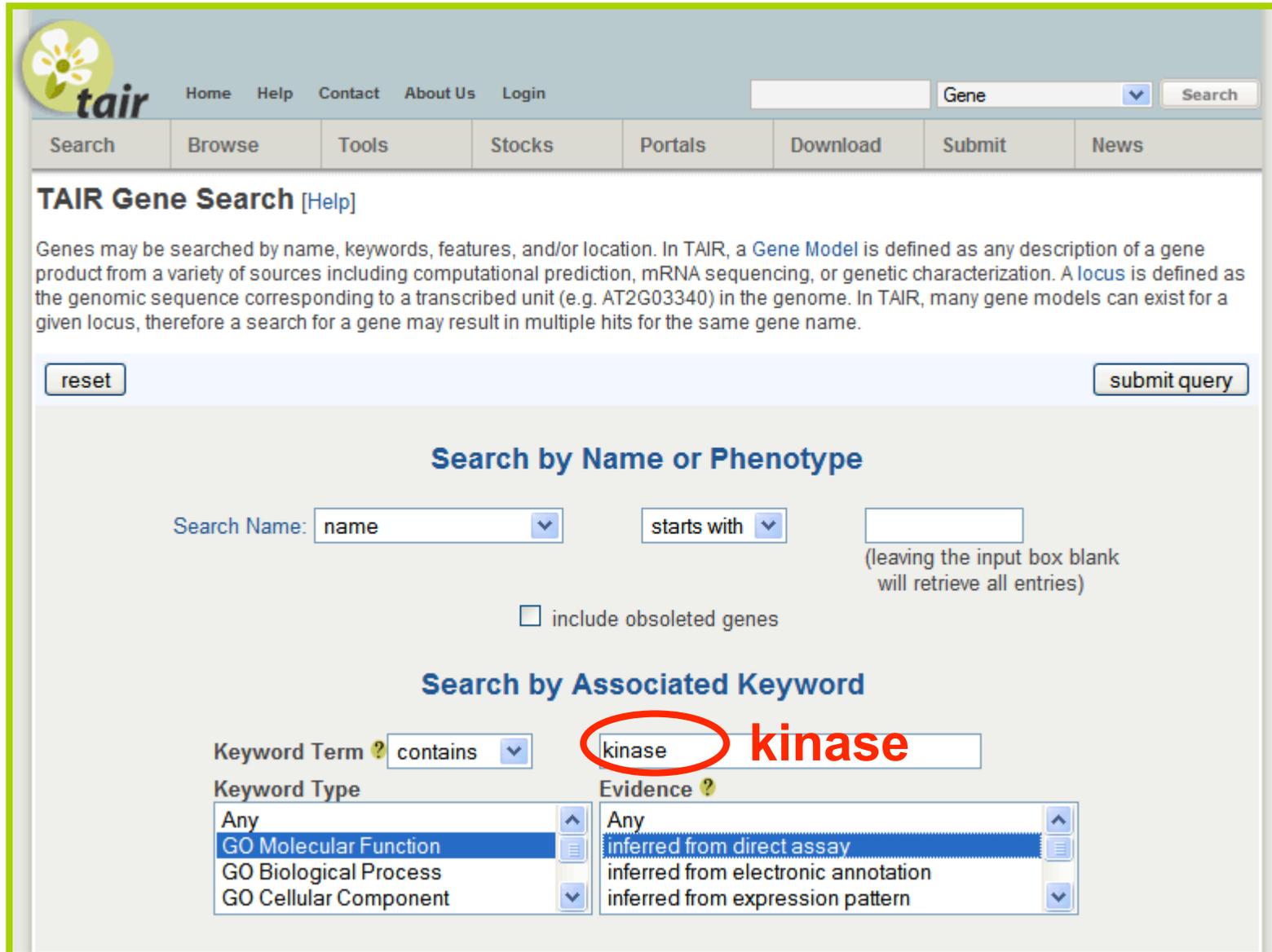
Polymorphism [?](#)

name ?	type ?	Polymorphism site	Allele type ?
SALK_058629	insertion	exon	unknown
SALK_058184.48.30.x	insertion	promoter	unknown
AL759099	insertion	promoter	unknown
AL759098	insertion	promoter	unknown
SALK_014699.34.20.x	insertion	exon	unknown
FLAG_551A12	insertion	exon	unknown
BX948148	insertion	exon	unknown
SALK_133449.29.60.n	insertion	exon	unknown
ET10772.Ds3.10.17.2002.jw68.362	insertion	intron	unknown
SAIL_252b_F06.v1	insertion	promoter	unknown
WiscDsLox433A3	insertion	intron	unknown
FLAG_070H08	insertion	intron	unknown
FLAG_070B10	insertion	intron	unknown
FLAG_071F01	insertion	intron	unknown

Proteins
Map Info
Gene structure
Mutations

And.....

Search for gene by GO annotation



The screenshot shows the TAIR Gene Search interface. At the top, there is a navigation bar with links for Home, Help, Contact, About Us, and Login. A search bar contains the word "Gene" and a "Search" button. Below this is a menu with options: Search, Browse, Tools, Stocks, Portals, Download, Submit, and News.

The main heading is "TAIR Gene Search [Help]". Below it is a paragraph explaining that genes can be searched by name, keywords, features, and/or location, and that a Gene Model is defined as any description of a gene product.

There are two buttons: "reset" and "submit query".

The "Search by Name or Phenotype" section includes a "Search Name:" dropdown set to "name", a "starts with" dropdown, and an empty input box. A note states: "(leaving the input box blank will retrieve all entries)". There is also a checkbox for "include obsoleted genes".

The "Search by Associated Keyword" section is highlighted. It features a "Keyword Term" dropdown set to "contains" and an input box containing "kinase", which is circled in red. Below this are two dropdown menus: "Keyword Type" and "Evidence".

Keyword Type	Evidence
Any	Any
GO Molecular Function	inferred from direct assay
GO Biological Process	inferred from electronic annotation
GO Cellular Component	inferred from expression pattern



TAIR Gene Search Results

new search
new gene search

download all
download all results

download checked
check the boxes below and download results

Your query for genes where keyword contains the term **kinase** and keyword types of molecular function and evidences of IDA resulted in **106** loci matches with **224** distinct gene models associated to the keyword or keyword children terms.

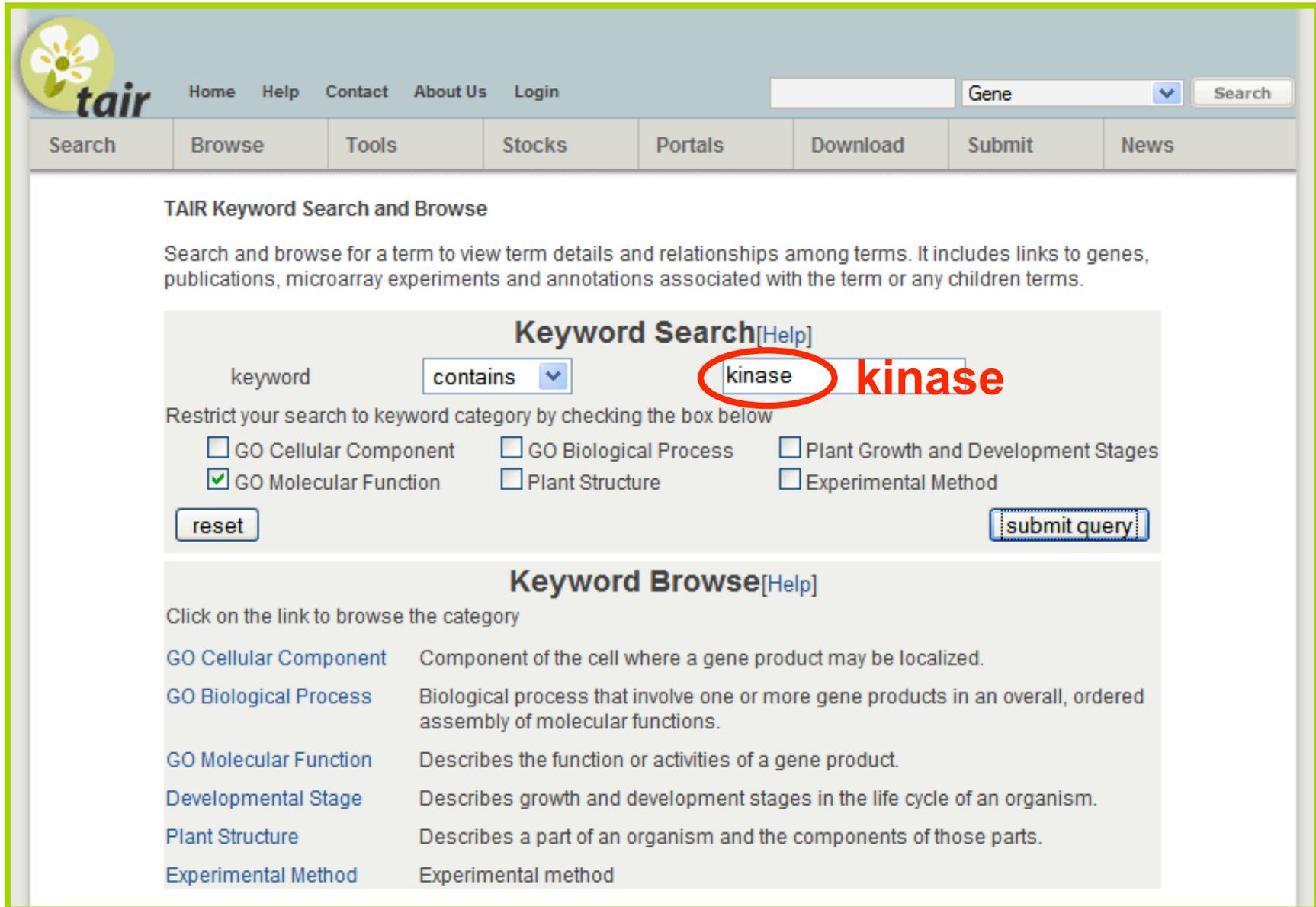
Displaying 1 - 25.

To see ESTs associated with your gene of interest, click on the Locus link.

Check All Uncheck All

Locus ?	Gene Model ?	Description ?	Other Names ?	full-length cDNA	Keywords ?
1 <input type="checkbox"/>	AT1G02970 AT1G02970.1	Protein kinase that negatively regulates the entry into mitosis.	WEE1 F22D16.3 WEE1-KINASE F22D16_3	yes	mitochondrion, kinase activity, protein kinase activity, protein amino acid phosphorylation
2 <input type="checkbox"/>	AT1G03930 ADK1	Phosphorylates serine, threonine, and tyrosine	DUAL SPECIFICITY KINASE 1 DUAL SPECIFICITY KINASE 1	yes	protein threonine/tyrosine kinase activity, signal transduction
	AT1G03930.1	protein kinase (ADK1), identical to dual specificity kinase 1 (ADK1) (Arabidopsis thaliana) gi 1216484 gb AAB47968; supported by cDNA gi:18700076 and gi:1216483. Note: differences between cDNAs in the 11th exon, possibly due to errors or alternative splicing.	F21M11.14 F21M11_14 CKL9BETA CKL9ALPHA	yes	cytoplasm, nucleus, kinase activity
3 <input type="checkbox"/>	AT1G04120 AT1G04120.1	ABC transporter family protein, Strong similarity to MRP-like ABC	F20D22.11 F20D22_11	yes	integral to membrane, endomembrane system

Search or browse keywords/GO terms



TAIR Keyword Search and Browse

Search and browse for a term to view term details and relationships among terms. It includes links to genes, publications, microarray experiments and annotations associated with the term or any children terms.

Keyword Search[\[Help\]](#)

keyword **kinase**

Restrict your search to keyword category by checking the box below

GO Cellular Component GO Biological Process Plant Growth and Development Stages
 GO Molecular Function Plant Structure Experimental Method

Keyword Browse[\[Help\]](#)

Click on the link to browse the category

GO Cellular Component	Component of the cell where a gene product may be localized.
GO Biological Process	Biological process that involve one or more gene products in an overall, ordered assembly of molecular functions.
GO Molecular Function	Describes the function or activities of a gene product.
Developmental Stage	Describes growth and development stages in the life cycle of an organism.
Plant Structure	Describes a part of an organism and the components of those parts.
Experimental Method	Experimental method

Search or browse keywords/GO terms

The screenshot shows the TAIR (The Arabidopsis Information Resource) website interface. At the top left is the TAIR logo. Navigation links include Home, Help, Contact, About Us, and Login. A search bar is present with a dropdown menu set to 'Gene' and a 'Search' button. Below this is a menu with options: Search, Browse, Tools, Stocks, Portals, Download, Submit, and News.

The main section is titled 'Keyword Search'. It features a 'keyword' input field, a 'starts with' dropdown menu, and an empty search box. Below this, there is a section to 'Restrict your search to keyword category by checking the box below' with six checkboxes:

- GO Cellular Component
- GO Biological Process
- Plant Growth and Developmental Stages
- GO Molecular Function
- Plant Structure
- Experimental Method

 There are 'reset' and 'submit query' buttons.

The results section is titled 'TAIR Keyword Search Results' and states: 'Your query for keywords where contains **kinase** resulted in **354** matches. Displaying 1 - 25 of 354 records on page 1 of 15 pages.'

Keyword ?	Keyword Category	Tree View ?	Associated Data(to this term and to children terms)
1-phosphatidylinositol 4-kinase activity	GO Molecular Function	treeview	3 genes, 2 publications, 3 annotations
1-phosphatidylinositol-3-phosphate 5-kinase activity	GO Molecular Function	treeview	1 genes, 1 publications, 1 annotations
1-phosphatidylinositol-4-phosphate 5-kinase activity	GO Molecular Function	treeview	17 genes, 1 publications, 18 annotations
1-phosphatidylinositol-5-phosphate 4-kinase activity	GO Molecular Function	treeview	
1-phosphatidylinositol-5-phosphate kinase	GO Molecular Function	treeview	
1-phosphofructokinase activity	GO Molecular Function	treeview	
inositol trisphosphate 3-kinase activity	GO Molecular Function	treeview	

Search for gene by phenotype

The screenshot shows the TAIR Gene Search interface. At the top, there is a navigation bar with links for Home, Help, Contact, About Us, and Login. A search bar is present with a dropdown menu set to 'Gene' and a 'Search' button. Below this is a secondary navigation bar with buttons for Search, Browse, Tools, Stocks, Portals, Download, Submit, and News.

The main section is titled 'TAIR Gene Search [Help]'. It contains a paragraph explaining that genes can be searched by name, keywords, features, and/or location, and that a Gene Model is defined as any description of a gene product. Below this is a 'reset' button on the left and a 'submit query' button on the right.

The 'Search by Name or Phenotype' section has a 'Search Name' dropdown menu set to 'phenotype', a 'contains' dropdown menu, and an input box containing 'leaf shape'. The 'leaf shape' text is circled in red, and the text 'Leaf shape' is written in red above it. Below the input box is a note: '(leaving the input box blank will retrieve all entries)'. There is also a checkbox labeled 'include obsoleted genes' which is currently unchecked.

The 'Search by Associated Keyword' section has a 'Keyword Term' dropdown menu set to 'starts with' and an empty input box. Below this are two dropdown menus: 'Keyword Type' and 'Evidence'. The 'Keyword Type' dropdown is open, showing options: Any, GO Molecular Function, GO Biological Process, and GO Cellular Component. The 'Evidence' dropdown is also open, showing options: Any, inferred from direct assay, inferred from electronic annotation, and inferred from expression pattern.



TAIR Gene Search Results

new search new gene search download all download all results download checked check the boxes below and download results

Your query for genes where gene phenotype contains the term leaf shape , keyword term is any and keyword types of null resulted in 14 loci matches with 27 distinct gene models associated to the keyword or keyword children terms.

Displaying 1 - 14.

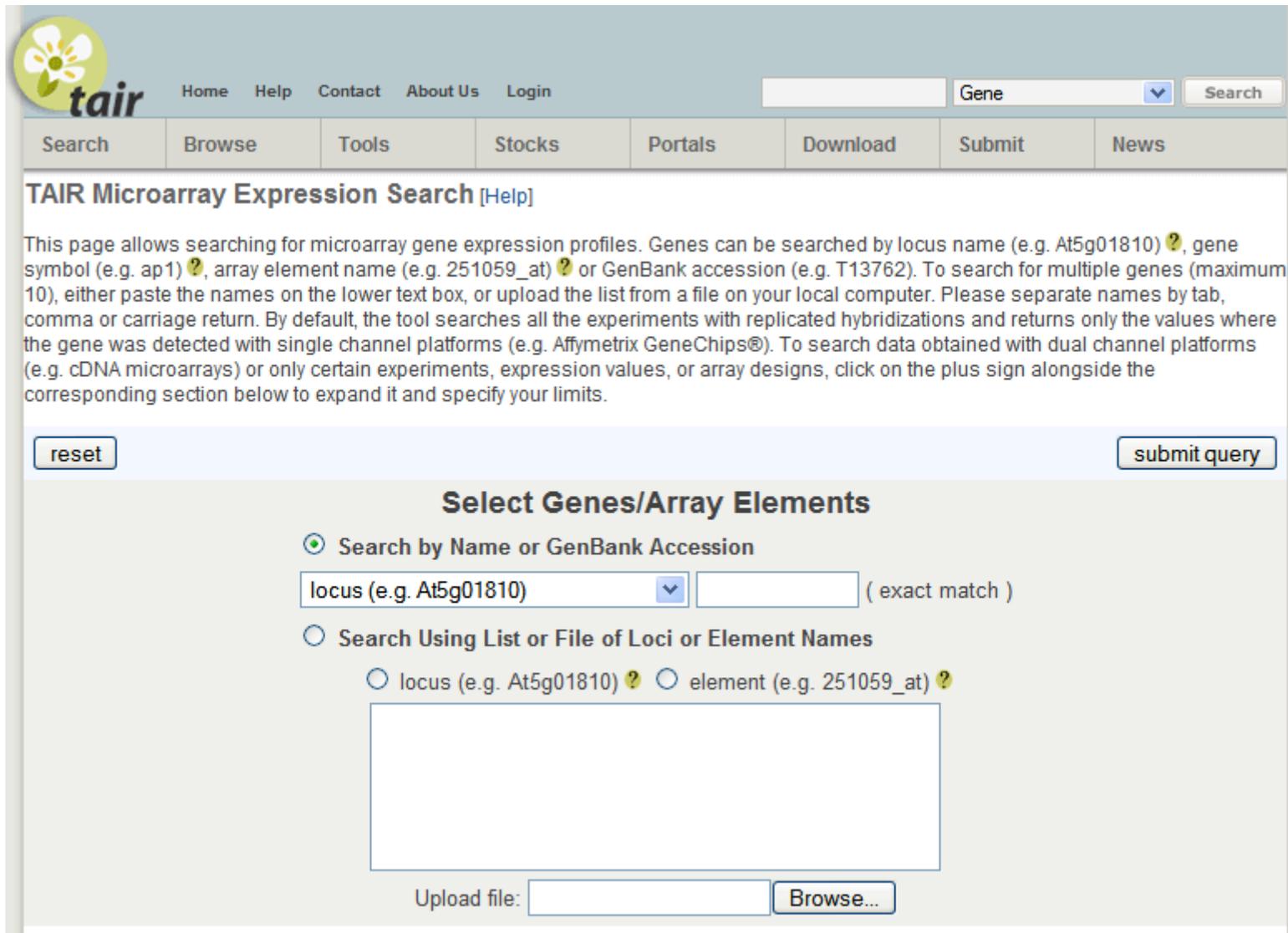
To see ESTs associated with your gene of interest, click on the Locus link.

Check All Uncheck All

Table with columns: Locus, Gene Model, Description, Other Names, full-length cDNA, Keywords. Row 1: AT1G07630 PLL5 protein phosphatase 2C family protein / PP2C family protein... Row 2: AT1G27320 AHK3 Encodes a histidine kinases receptor that controls cytokin...

PLL5 Encodes a protein phosphatase 2C like gene, similar to POL. Involved in leaf development. Knockout mutants have abnormally shaped leaves.

Custom report on some aspect of gene



The screenshot shows the TAIR Microarray Expression Search web interface. At the top left is the TAIR logo (a green flower) and navigation links: Home, Help, Contact, About Us, and Login. To the right is a search bar with a dropdown menu set to 'Gene' and a 'Search' button. Below this is a horizontal menu with buttons for Search, Browse, Tools, Stocks, Portals, Download, Submit, and News.

TAIR Microarray Expression Search [\[Help\]](#)

This page allows searching for microarray gene expression profiles. Genes can be searched by locus name (e.g. At5g01810) [?](#), gene symbol (e.g. ap1) [?](#), array element name (e.g. 251059_at) [?](#) or GenBank accession (e.g. T13762). To search for multiple genes (maximum 10), either paste the names on the lower text box, or upload the list from a file on your local computer. Please separate names by tab, comma or carriage return. By default, the tool searches all the experiments with replicated hybridizations and returns only the values where the gene was detected with single channel platforms (e.g. Affymetrix GeneChips®). To search data obtained with dual channel platforms (e.g. cDNA microarrays) or only certain experiments, expression values, or array designs, click on the plus sign alongside the corresponding section below to expand it and specify your limits.

Select Genes/Array Elements

Search by Name or GenBank Accession

locus (e.g. At5g01810) (exact match)

Search Using List or File of Loci or Element Names

locus (e.g. At5g01810) [?](#) element (e.g. 251059_at) [?](#)

Upload file:

Custom report on some aspect of gene



Home Help Contact About Us Login

Gene Search

Search Browse Tools Stocks Portals Download Submit News

TAIR Microarray Expression Search [Help]

new expression search
 download all results
 check the boxes below and download results

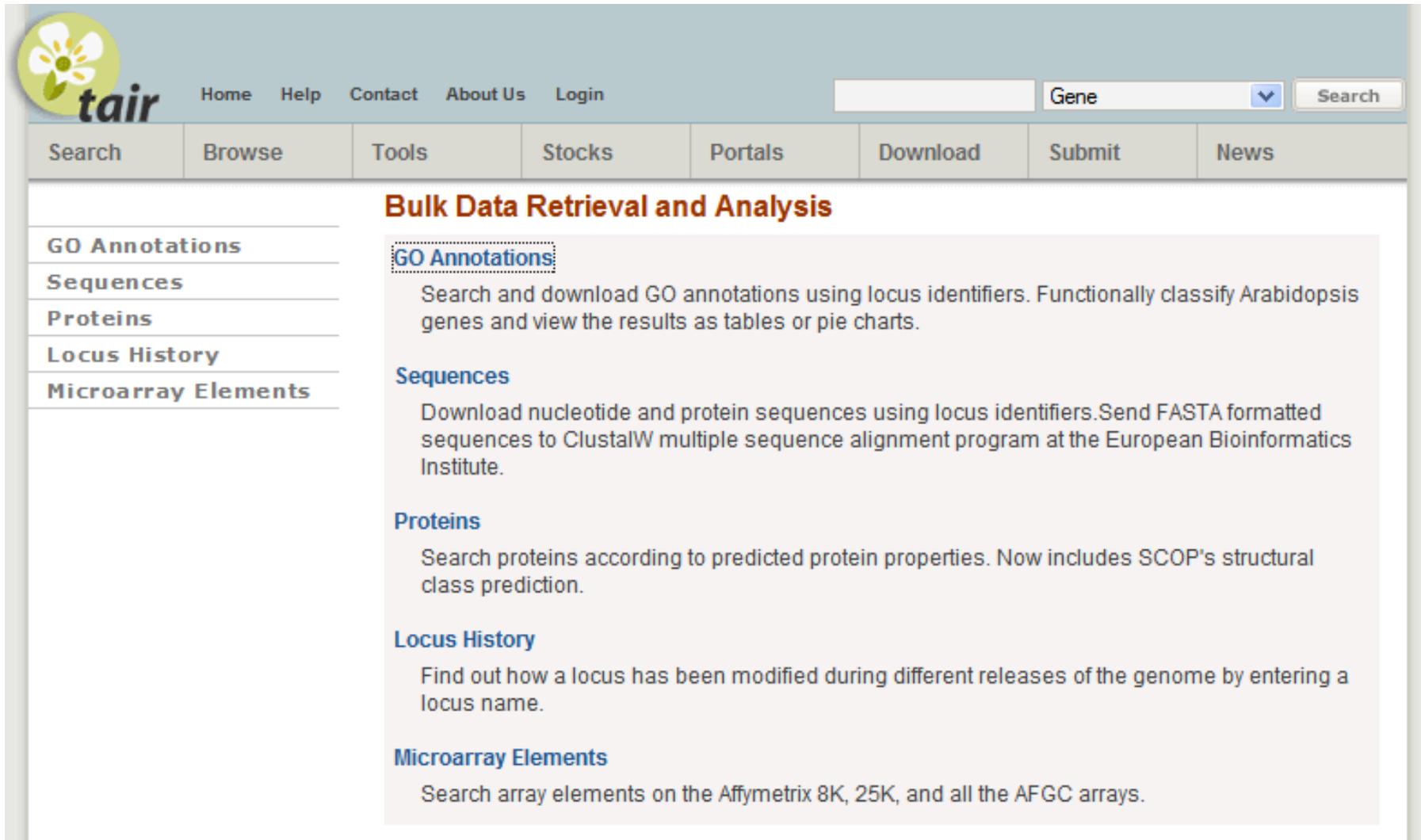
Your query for expression values for array type of **single channel** where the provided list of names is of type **locus**, the array design of **any**, the analysis level of the values at the **replicate** level, detection is **P**, signal is between **0** and **50000**, signal percentile is between **0** and **100** resulted in **640** records.

Displaying 1 - 25 of 640 records on page 1 of 26 pages.

RepSet Signal(high to low)

	Array Element (Locus Identifier ?)	Experiment Name ?	Sample Variables ?	RepSet id/name ?	RepSet Call (p-value/std err) ?	RepSet Signal (std err) ?	RepSet Percentile (std err) ?	Slide ?	Slide Call (p-value) ?	Slide Signal ?	Slide Percentile ?
1	<input type="checkbox"/> 251059_at (AT5G01810)	Tissue Type Arrays of Columbia-0	rosette leaf , greenhouse , age	413 Leaf Green House	P (0.043/ 0.013)	64.6 (8.4)	45.161 (2.693)	LEAF_GH1 LEAF_GH2	M P (0.030)	56.2 73.0	42.468 47.854
2	<input type="checkbox"/> 251059_at (AT5G01810)	Tissue Type Arrays of Columbia-0	flower , controlled system , age	414 Flower Growth Chamber	P (0.001/ 0.000)	212.9 (27.8)	71.189 (3.41)	FLOWER_GC5 FLOWER_GC6	P P (0.001)	185.1 240.7	67.779 74.599
3	<input type="checkbox"/> 251059_at (AT5G01810)	Tissue Type Arrays of Columbia-0	flower , greenhouse , age	415 Flower Green House	P (0.000/ 0.000)	405.0 (112.1)	84.175 (5.104)	FLOWER_GH5 FLOWER_GH6	P P (0.000)	292.9 517.1	79.071 89.279

Bulk output based on a query

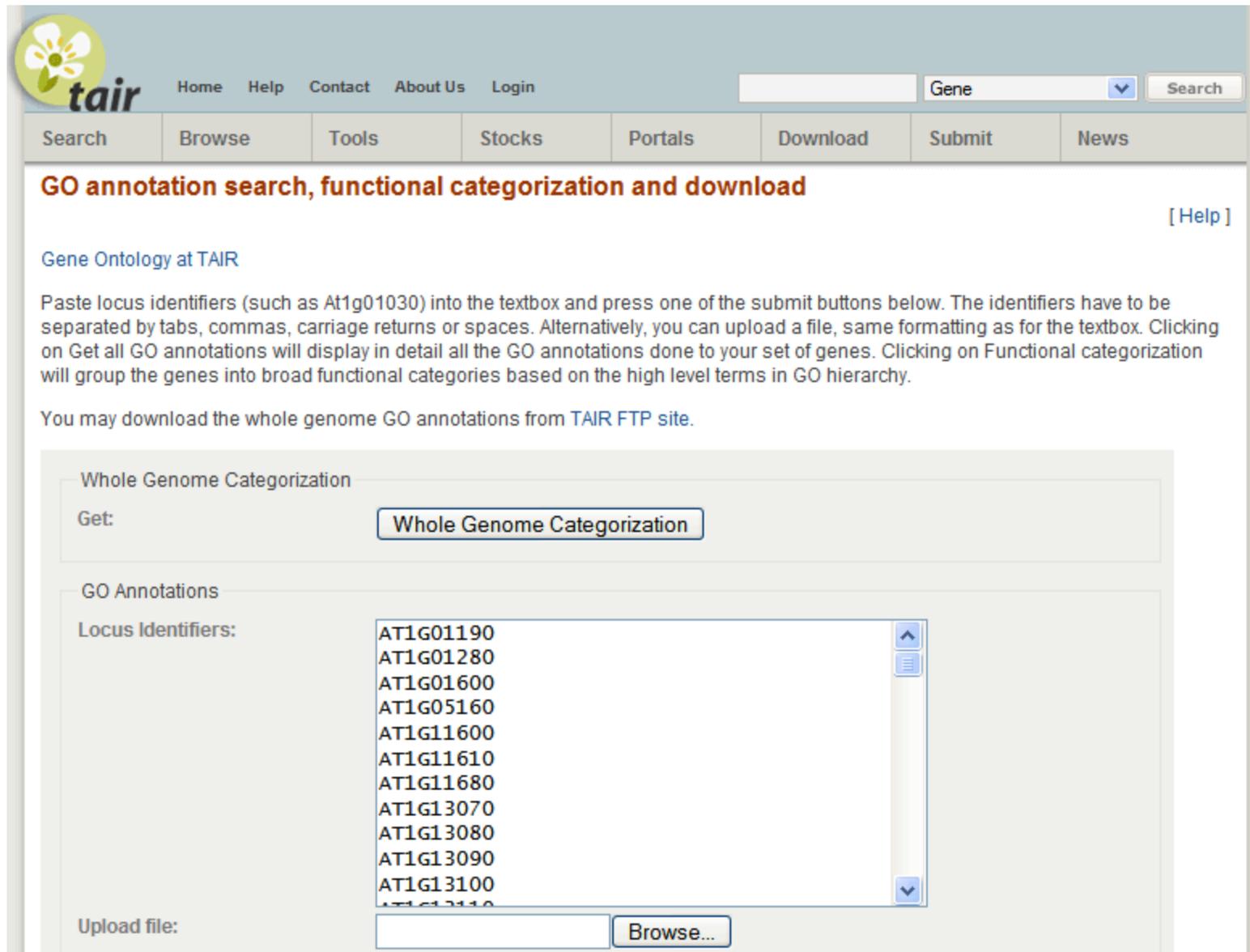


The screenshot displays the tair website interface. At the top left is the tair logo, a stylized flower. To its right are navigation links: Home, Help, Contact, About Us, and Login. Further right is a search bar with the text 'Gene' and a 'Search' button. Below the navigation is a horizontal menu with buttons for Search, Browse, Tools, Stocks, Portals, Download, Submit, and News. The main content area is titled 'Bulk Data Retrieval and Analysis' and contains several sections:

- GO Annotations**: Search and download GO annotations using locus identifiers. Functionally classify Arabidopsis genes and view the results as tables or pie charts.
- Sequences**: Download nucleotide and protein sequences using locus identifiers. Send FASTA formatted sequences to ClustalW multiple sequence alignment program at the European Bioinformatics Institute.
- Proteins**: Search proteins according to predicted protein properties. Now includes SCOP's structural class prediction.
- Locus History**: Find out how a locus has been modified during different releases of the genome by entering a locus name.
- Microarray Elements**: Search array elements on the Affymetrix 8K, 25K, and all the AFGC arrays.

On the left side of the main content area, there is a vertical list of links: GO Annotations, Sequences, Proteins, Locus History, and Microarray Elements.

Bulk query – GO annotations



The screenshot shows the TAIR (The Arabidopsis Information Resource) website interface for GO annotation search. At the top left is the TAIR logo. The navigation menu includes Home, Help, Contact, About Us, and Login. A search bar contains the word "Gene" and a "Search" button. Below the navigation is a menu with tabs for Search, Browse, Tools, Stocks, Portals, Download, Submit, and News. The main heading is "GO annotation search, functional categorization and download" with a "[Help]" link. The text explains that locus identifiers (e.g., At1g01030) should be pasted into a textbox and separated by tabs, commas, carriage returns, or spaces. It also mentions that clicking "Get all GO annotations" will display details, and "Functional categorization" will group genes into broad functional categories. A link to "TAIR FTP site" is provided for downloading whole genome GO annotations. The interface includes a "Whole Genome Categorization" section with a "Get:" label and a button labeled "Whole Genome Categorization". Below this is the "GO Annotations" section, which has a "Locus Identifiers:" label and a text area containing a list of identifiers: AT1G01190, AT1G01280, AT1G01600, AT1G05160, AT1G11600, AT1G11610, AT1G11680, AT1G13070, AT1G13080, AT1G13090, and AT1G13100. At the bottom of this section is an "Upload file:" label, a text input field, and a "Browse..." button.

GO annotation search, functional categorization and download [Help]

Gene Ontology at TAIR

Paste locus identifiers (such as At1g01030) into the textbox and press one of the submit buttons below. The identifiers have to be separated by tabs, commas, carriage returns or spaces. Alternatively, you can upload a file, same formatting as for the textbox. Clicking on Get all GO annotations will display in detail all the GO annotations done to your set of genes. Clicking on Functional categorization will group the genes into broad functional categories based on the high level terms in GO hierarchy.

You may download the whole genome GO annotations from [TAIR FTP site](#).

Whole Genome Categorization

Get:

GO Annotations

Locus Identifiers:

- AT1G01190
- AT1G01280
- AT1G01600
- AT1G05160
- AT1G11600
- AT1G11610
- AT1G11680
- AT1G13070
- AT1G13080
- AT1G13090
- AT1G13100

Upload file:

Bulk query – GO annotations



Home Help Contact About Us Login Logout

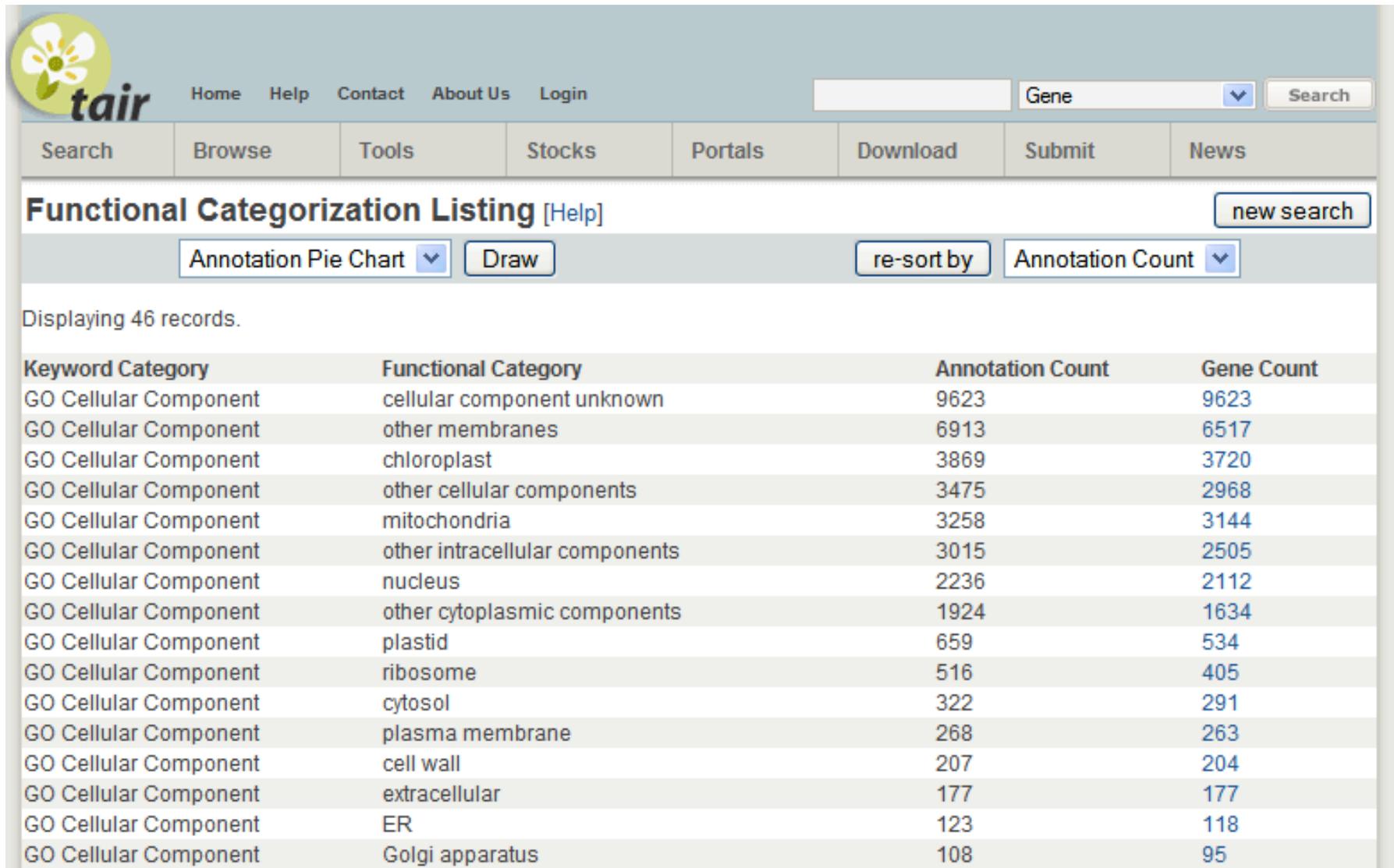
Gene Search

Search Browse Tools Stocks Portals Download Submit News

GO Annotations

Locus	Gene Model(s)	GO term (links to Tair Keyword Browser) (GO ID)	cat	code	GO Slim	Reference	Made by: date last modified
AT1G01190	AT1G01190.1	endomembrane system (GO:0012505)	comp	IEA	other membranes	:501717256	TAIR 2005-10-26
	AT1G01190.1	electron transport (GO:0006118)	proc	IEA	electron transport or energy pathways	AnalysisReference:501719615	TAIR 2006-09-13
	AT1G01190.1	oxygen binding (GO:0019825)	func	RCA	other binding	Communication:501714663	TIGR 2003-06-12
AT1G01280	AT1G01280.1	endomembrane system (GO:0012505)	comp	IEA	other membranes	:501717256	TAIR 2005-10-26
	AT1G01280.1	oxygen binding (GO:0019825)	func	RCA	other binding	Communication:501714663	TIGR 2002-05-06
	AT1G01280.1	electron transport (GO:0006118)	proc	IEA	electron transport or energy pathways	AnalysisReference:501719615	TAIR 2006-09-13

Bulk query – GO annotations



tair Home Help Contact About Us Login

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Gene Search

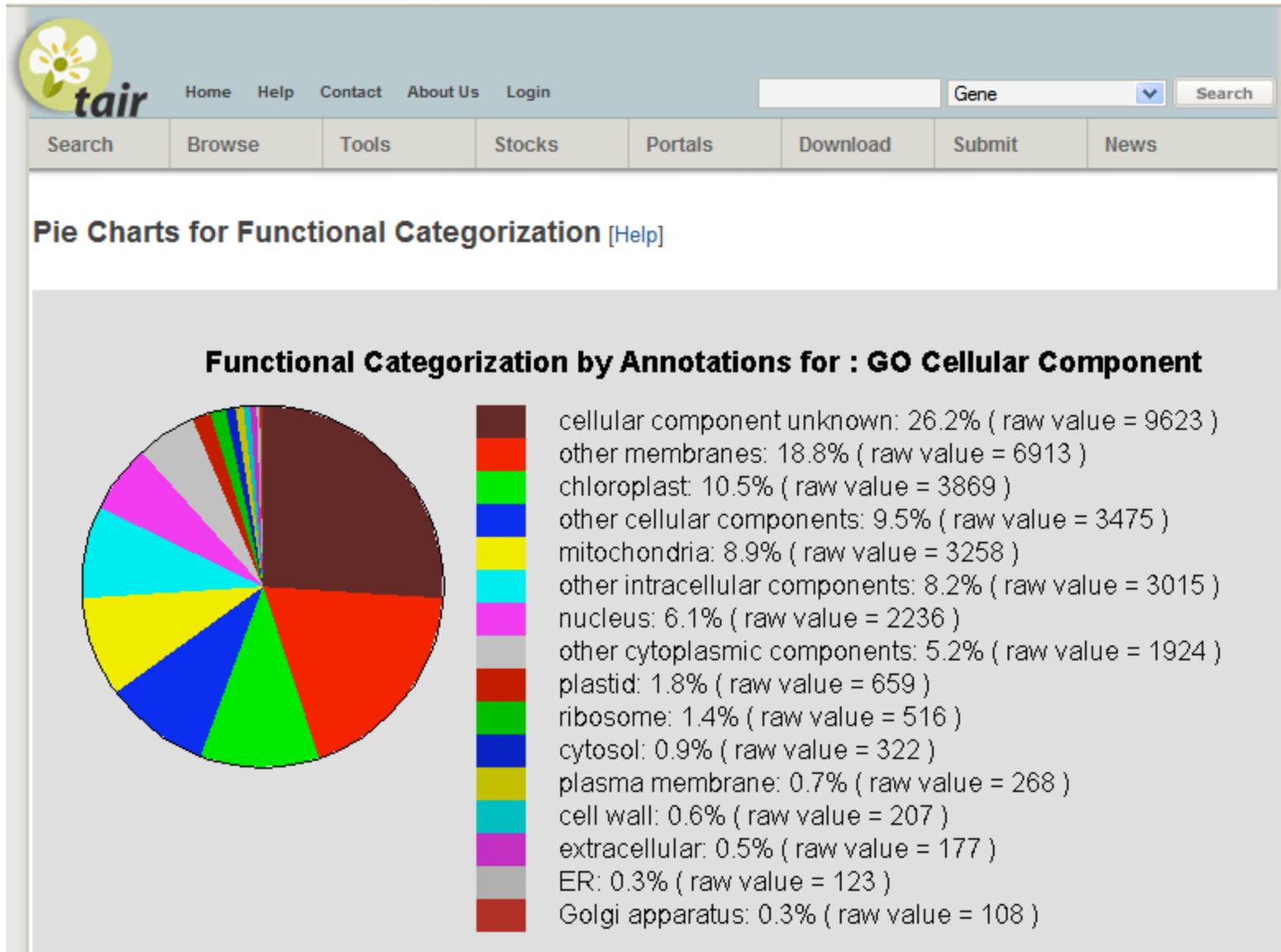
Functional Categorization Listing [Help] new search

Annotation Pie Chart Draw re-sort by Annotation Count

Displaying 46 records.

Keyword Category	Functional Category	Annotation Count	Gene Count
GO Cellular Component	cellular component unknown	9623	9623
GO Cellular Component	other membranes	6913	6517
GO Cellular Component	chloroplast	3869	3720
GO Cellular Component	other cellular components	3475	2968
GO Cellular Component	mitochondria	3258	3144
GO Cellular Component	other intracellular components	3015	2505
GO Cellular Component	nucleus	2236	2112
GO Cellular Component	other cytoplasmic components	1924	1634
GO Cellular Component	plastid	659	534
GO Cellular Component	ribosome	516	405
GO Cellular Component	cytosol	322	291
GO Cellular Component	plasma membrane	268	263
GO Cellular Component	cell wall	207	204
GO Cellular Component	extracellular	177	177
GO Cellular Component	ER	123	118
GO Cellular Component	Golgi apparatus	108	95

Bulk query – GO annotations



Bulk query - proteins

The screenshot shows the TAIR Bulk Protein Search web interface. At the top left is the TAIR logo. A navigation bar contains links for Home, Help, Contact, About Us, and Login. To the right is a search box with the text 'Gene' and a 'Search' button. Below this is a menu with tabs for Search, Browse, Tools, Stocks, Portals, Download, Submit, and News. The main heading is 'Bulk Protein Search [help]'. A note states: 'Search proteins according to predicted protein properties. Note: All datasets have been updated to TAIR6 Genome Release (November 11, 2005)'. There are 'Reset' and 'Get Protein Data' buttons. The 'Output Options' section includes a 'Format' dropdown set to 'html' (with 'text' as an alternative) and a note: 'Output reverts to text if output > 1000 proteins.' Below this are several checked checkboxes: 'Molecular Weights', 'Intracellular locations', 'Number of transmembrane domains', and 'SCOP's structural class' (with a 'NEW' tag). Other unchecked options are 'Isoelectric points', 'Domains', and 'SwissProt ID'. The 'Limit search to specific loci' section has two radio buttons: 'Search all proteins' (unchecked) and 'Perform search in following subset:' (checked). Below this is a scrollable list of gene IDs: AT1G01190, AT1G01280, AT1G01600, AT1G05160, AT1G11600, AT1G11610, and AT1G11620. At the bottom, there is an 'Upload file:' label, an empty text box, and a 'Browse...' button.

Home Help Contact About Us Login

Gene Search

Search Browse Tools Stocks Portals Download Submit News

Bulk Protein Search [help]

Search proteins according to predicted protein properties. Note: All datasets have been updated to TAIR6 Genome Release (November 11, 2005).

Reset Get Protein Data

Output Options

Format: html text
Output reverts to text if output > 1000 proteins.

Output: Molecular Weights Isoelectric points
 Intracellular locations Domains
 Number of transmembrane domains SwissProt ID
 SCOP's structural class **NEW**

Limit search to specific loci

Search all proteins
 Perform search in following subset:

AT1G01190
AT1G01280
AT1G01600
AT1G05160
AT1G11600
AT1G11610
AT1G11620

Upload file: Browse...

Bulk query - proteins



Home Help Contact About Us Login Logout

Gene

Search Browse Tools Stocks Portals Download Submit News

18 proteins matched your query.

Locus	Protein SeqViewer	MW [Da]	pI	Location	TM Domains
AT1G13110	sequence SV	57210	8.3819	secreted	1
AT1G01600	sequence SV	62604	8.0992	mitochondrion	0
AT1G11680	sequence SV	55496	8.5263	secreted	1
AT1G19630	sequence SV	47123	7.3978	secreted	0
AT1G11610	sequence SV	56277	8.3584	mitochondrion	0
AT1G13090	sequence SV	56538	7.0387	secreted	0
AT1G16400	sequence SV	61433	8.2556	secreted	1
AT1G13710	sequence SV	57644	8.5654	secreted	1
AT1G01280	sequence SV	57855	8.5474	secreted	1
AT1G01190	sequence SV	60316	8.2220	secreted	1
AT1G13100	sequence SV	56006	8.1385	secreted	0
AT1G16410	sequence SV	61696	8.3888	secreted	2
AT1G17060	sequence SV	54932	9.9085	secreted	1
AT1G11600	sequence SV	58042	8.3976	secreted	0
AT1G13080	sequence SV	57141	7.6016	secreted	1
AT1G13140	sequence SV	59779	8.6403	secreted	0
AT1G13150	sequence SV	61333	8.1499	secreted	2
AT1G05160	sequence SV	56410	8.6323	secreted	1

Combine results with info from other data sources

- External links on TAIR data pages
 - Links go directly to relevant data in other resource
- Inclusion of IDs from other databases
 - GenBank accession, pubmed ID
- Web services in progress



Home Help Contact

Search Browse Tools

Locus: AT1G01140

Date last modified 2003-05-02

TAIR Accession Locus:2035367

Representative Gene Model [AT1G01140.1](#)

Other names: CBL-INTERACT

Other Gene Models **Name**
CIPK9

[AT1G01140.2](#)
(splice variant)

Protein Data **name**
AT1G01140

Map Locations **chrom**
1
1

Map Links [Map Viewer](#)

Gene Feature **type**
ORF
5' utr
coding_regi
coding_regi
coding_regi
coding_regi
coding_regi

Germplasm **Showing 5 of 5 entries**

Name/Image	Polymorphisms	Background	Stock Name	Select
SALK_014699	SALK_014699.34.20.x		SALK_014699	<input type="checkbox"/>

Phenotypes **None available**

SALK_058184	SALK_058184.48.30.x		SALK_058184	<input type="checkbox"/>
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Phenotypes **None available**

SALK_058629	SALK_058629		SALK_058629	<input type="checkbox"/>
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Phenotypes **None available**

[Order from ABRC](#) [Reset](#) [Order from NASC](#) (European Users)

External Link [AtGDB View](#)
[TIGR View](#)
[MPSS](#)
[NASCArrays Digital Northern](#)
[NASCArrays Spot History](#)

External Link ?

- [AtGDB View](#)
- [TIGR View](#)
- [MPSS](#)
- [NASCArrays Digital Northern](#)
- [NASCArrays Spot History](#)
- [Genevestigator Gene Atlas](#)
- [Genevestigator Gene Chronologer](#)
- [Genevestigator Response Viewer](#)
- [e-FP Browser](#)
- [AtGenExpress Visualization Tool](#)
- [MIPS View](#)

Annotations ?

RNA Data

One-channel Arr

Associated Transcripts ?

EST
cDNA

Description **CBL-interacting gij13249117[gb]**
identical to cDN/

Chromosome 1

Nucleotide Sequence **full length CDS**

SALK_1334
ET10772.Ds
SAIL_252b_
WiscDsLox4
FLAG_070H
FLAG_070B
FLAG_071F

Publication ?

title	source	associated gene models	date
The NAF domain defines a novel protein-protein interaction module conserved in Ca2+-regulated kinases.	THE EMBO JOURNAL	CIPK9	2001

printer-friendly version

2252 from (Sorghum bicolor); supported by 2002-05-02

[Show All Comments](#)

date
2002-06-24
2002-06-24
2002-06-24

name	associated gene models	date
Ecker		2002-06-24



Home Help Contact

Search Browse Tools

Locus: AT1G01140

Date last modified 2003-05-02
 TAIR Accession Locus:2035367
 Representative Gene Model [AT1G01140.1](#)
 Other names: CBL-INTERACT
 Other Gene Models
 Name CIPK9
 AT1G01140.2 (splice variant)

Protein Data ?	
name	AT1G01140
Showing 5 of 5 entries	
Map Locations ?	
chrom	1
Map Links ?	Map Viewer
Gene Feature ?	type
	ORF
	5' utr
	coding_regi
	coding_regi
	coding_regi
	coding_regi

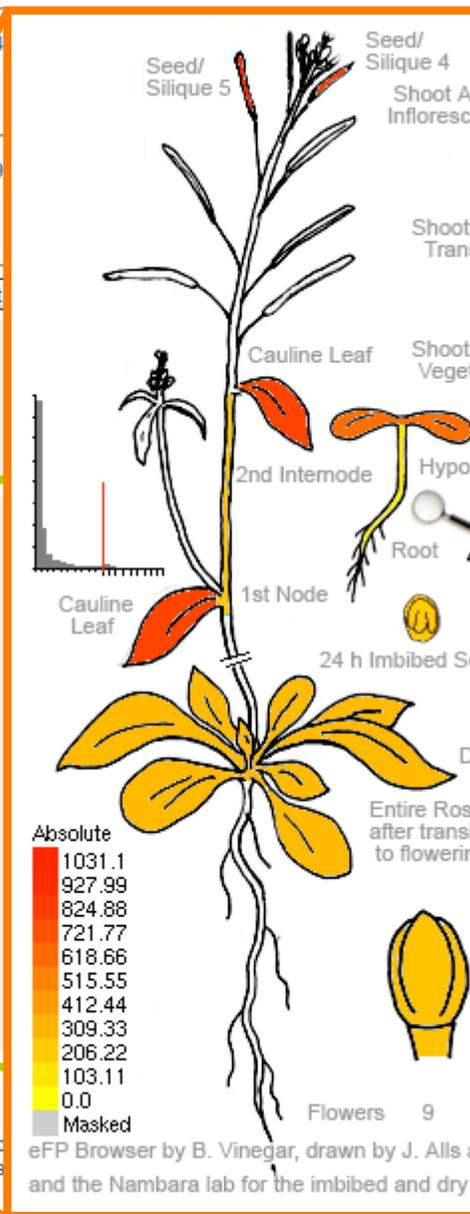
Germplasm ?	Name/Image	Polymorphisms	Background	Stock Name	Select
	SALK_014699	SALK_014699.34.20.x		SALK_014699	<input type="checkbox"/>
Phenotypes ? None available					
	SALK_058184	SALK_058184			
Phenotypes ? None available					
	SALK_058629	SALK_058629			
Phenotypes ? None available					

Order from ABRC Reset

External Link ?
AtGDB View
TIGR View
MPSS
NASCArrays Digital Northern
NASCArrays Spot History

External Link ?

- [AtGDB View](#)
- [TIGR View](#)
- [MPSS](#)
- [NASCArrays Digital Northern](#)
- [NASCArrays Spot History](#)
- [Geneinvestigator Gene Atlas](#)
- [Geneinvestigator Gene Chronologer](#)
- [Geneinvestigator Response Viewer](#)
- [e-FP Browser](#)
- [AtGenExpress Visualization Tool](#)
- [MIPS View](#)



Annotations ?

RNA Data

One-channel Arr

Associated Transcripts ?

EST cDNA
 Description ? CBL-interacting gij13249117[gb] identical to cDN/
 Chromosome 1
 Nucleotide Sequence ? full length CDS

Publication ?	title
SALK_1334 ET10772.Ds SAIL_252b_ WiscDsLox4 FLAG_070H FLAG_070B FLAG_071F	The NAF domain defines a novel p module conserved in Ca ²⁺ -regula

printer-friendly version

orted by 2002-05-02

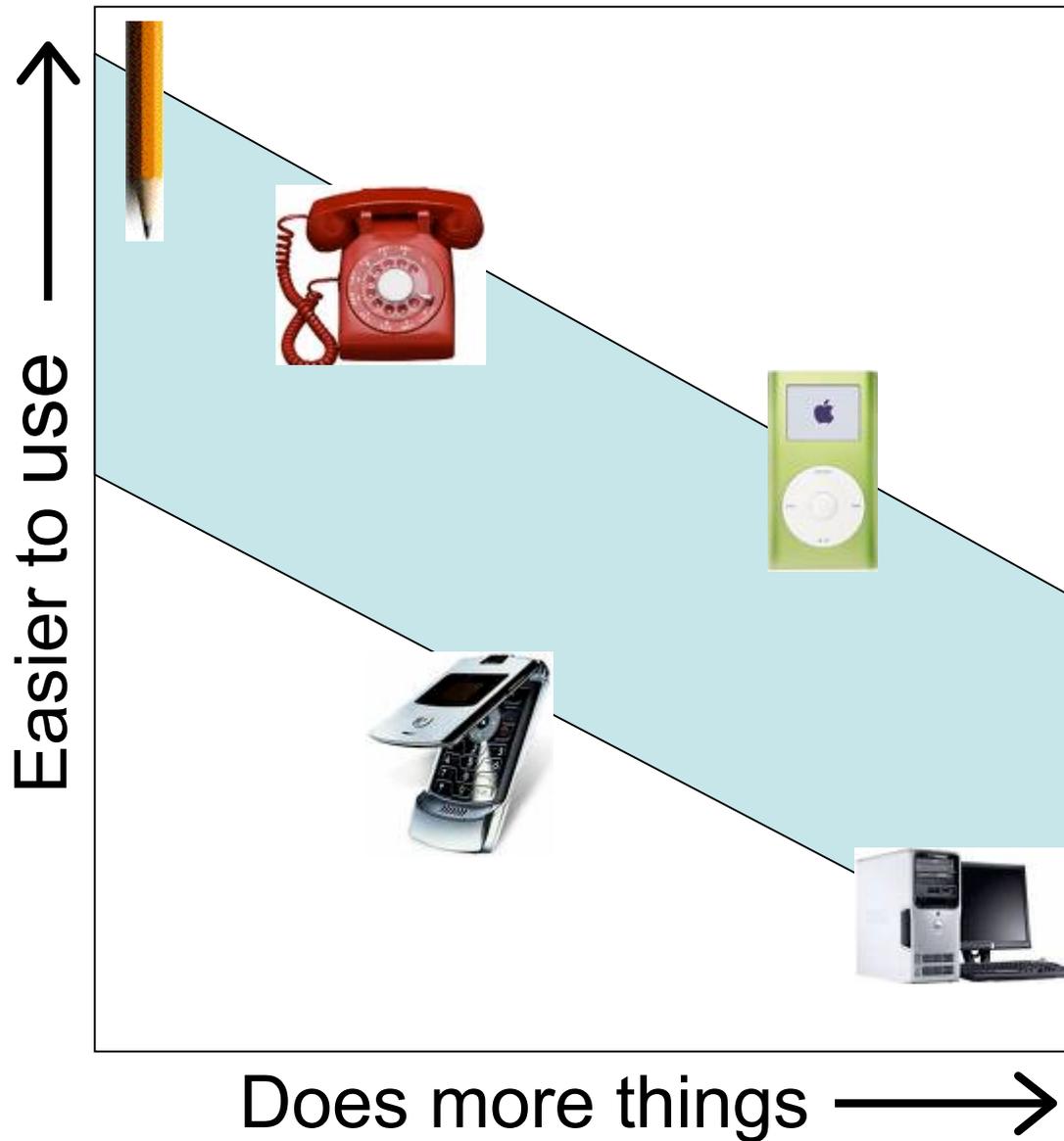
is date 2002-06-24

associated gene models date

PK9 2001

eFP Browser by B. Vinegar, drawn by J. Ails a and the Nambara lab for the imbibed and dry s

The Tradeoff



A Good Design

- “How to use” is obvious
- Results match expectations