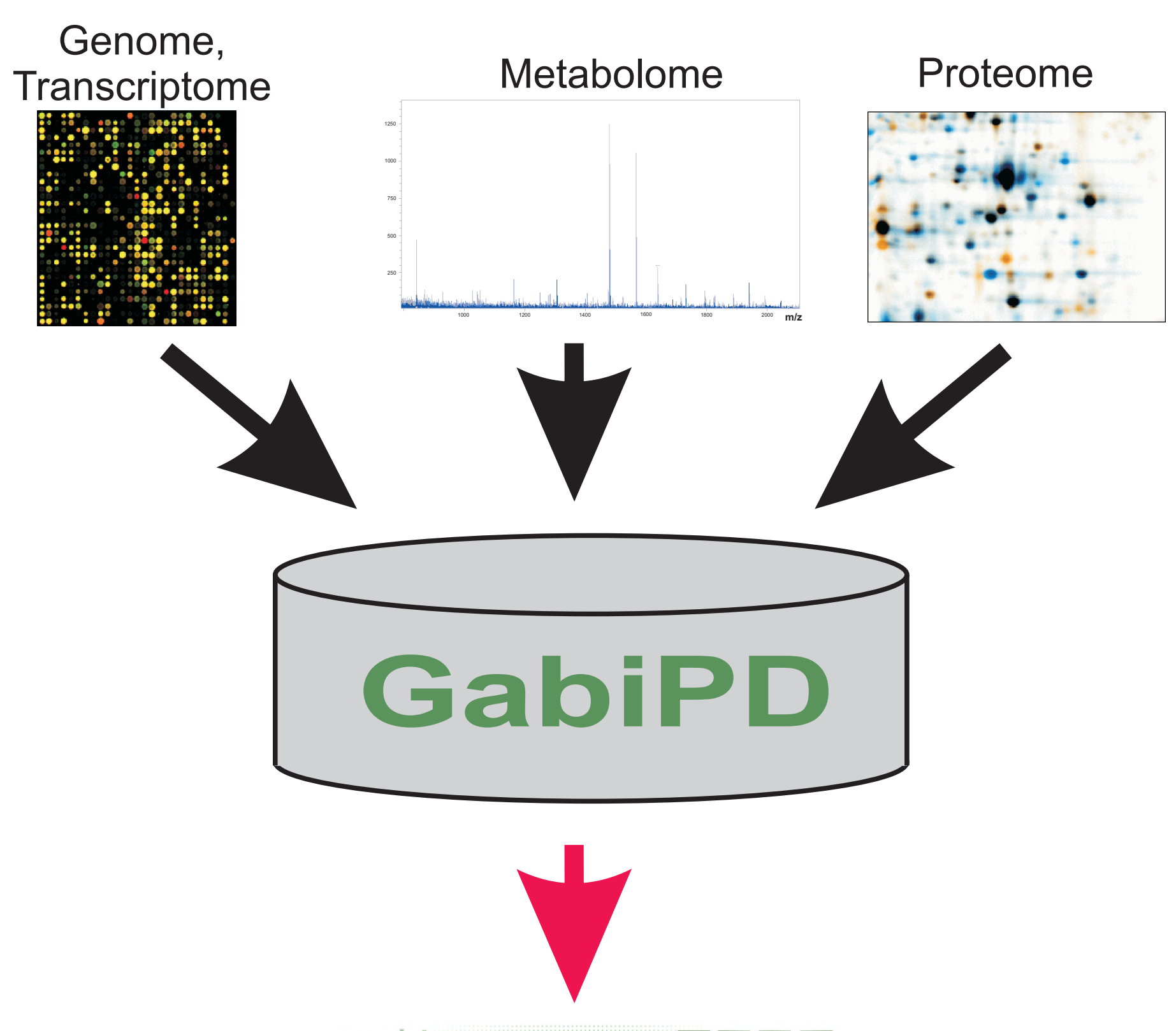


a plant integrative 'omics' database in GABI-FUTURE

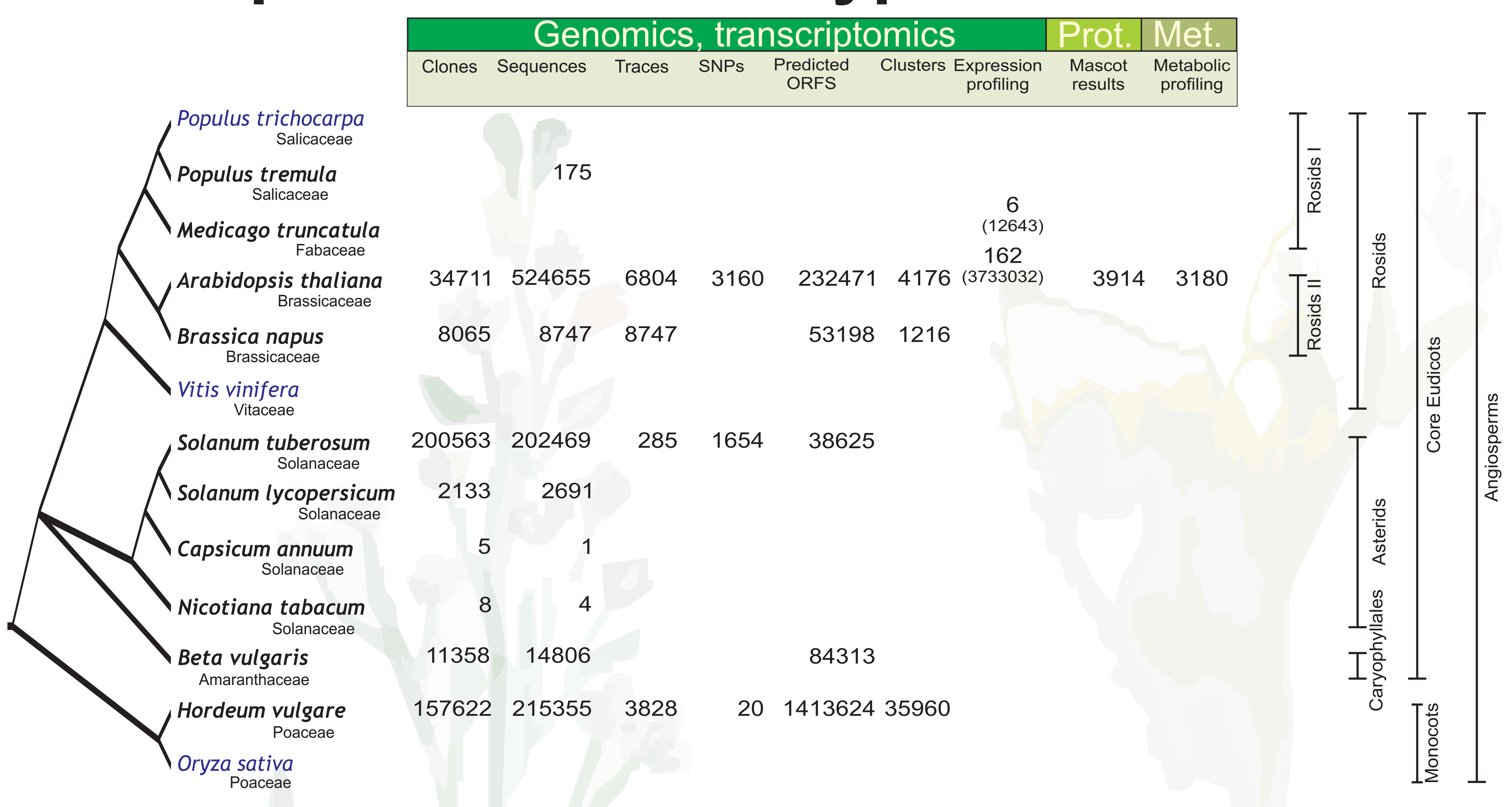
<http://www.gabipd.org>  
gabipd@mpimp-golm.mpg.de

Diego Mauricio Riaño-Pachón, Axel Nagel, Robert Wagner, Elke Weber, Birgit Kersten  
Bioinformatics, Max Planck Institute of Molecular Plant Physiology, Wissenschaftspark Golm, Am Mühlenberg 1, 14476 Potsdam - Golm, Germany

## 1. 'omics' data



## 2. Species and data types in GabiPD



Phylogenetic tree depicting the evolutionary relationships among the species represented in GabiPD. Species in blue represent completely sequenced and annotated genomes which will be included soon in GabiPD, facilitating information transfer in a comparative genomics context. This tree reflects our current knowledge on the evolution of seed plants (references at the bottom). Few additional solanaceous species present in GabiPD are not shown in the tree: *S. bulbocastanum*, *S. demissum*, *S. phureja*, and *S. spegazzinii*.

## 3. All roads lead to the Gene's GreenCard

**Clone GreenCard**  
Gene: AT5G14990.1  
Genotype (Genotype): Arabidopsis thaliana  
Species: Arabidopsis thaliana  
Type: wildtype  
Common name: thale cress  
Cultivar: Ackermann-2 (A6-2)

**Transgenic line GreenCard**  
Plant: 24A203 (T-DNA line)  
Genotype (Transgenic): Arabidopsis thaliana  
Species: Arabidopsis thaliana  
Type: transgenic  
Common name: thale cress  
Cultivar: Columbia  
Insertion type: T-DNA

**Proteomics data**  
SpotInfo:  
X-Coordinate: 597  
Y-Coordinate: 567  
Spot initially identified as AT5G14990.1  
Info for AT5G14990.1:  
Molecular Weight: 54197 Da  
pI: 5.1203  
Length: 486 a.a.  
Function: isocitrate dehydrogenase, putative / NADP+ isocitrate dehydrogenase, putative (TAIR 7.0)

**Gene's GreenCard**  
Gene: AT5G14990.1  
Genotype (Genotype): Arabidopsis thaliana  
Species: Arabidopsis thaliana  
Type: wildtype  
Common name: thale cress  
Cultivar: Columbia  
Gene function: isocitrate dehydrogenase, putative / NADP+ isocitrate dehydrogenase, putative (TAIR 7.0)  
Related with:  
24A203 Plant (T-DNA line)  
19S1177 Clone  
19S1177 Clone  
24A202 Plant (T-DNA line)  
MPS200001032 Clone  
MPS207890010 Clone  
MSL\_09502111 Clone  
MSL\_09502111 Clone  
MPS200001032 Clone  
Protein identified on 2D gel:  
AT5G14990.1  
External resources:  
TAIR  
MIPS  
Arabidopsis eFP browser  
ColEAF browser  
AraMiner  
PhosPhAT  
PhoFDB  
Sequence: AT5G14990.1  
submitter of sequence: public data  
length: 5447  
description: genomic sequence (TAIR 7.0)  
AT5G14990.1  
description: genomic sequence (TAIR 7.0)  
AT5G14990.1  
description: genomic sequence (TAIR 7.0)  
AT5G14990.1  
description: genomic sequence (TAIR 7.0)  
AT5G14990.1  
description: genomic sequence (TAIR 7.0)  
AT5G14990.1  
description: genomic sequence (TAIR 7.0)

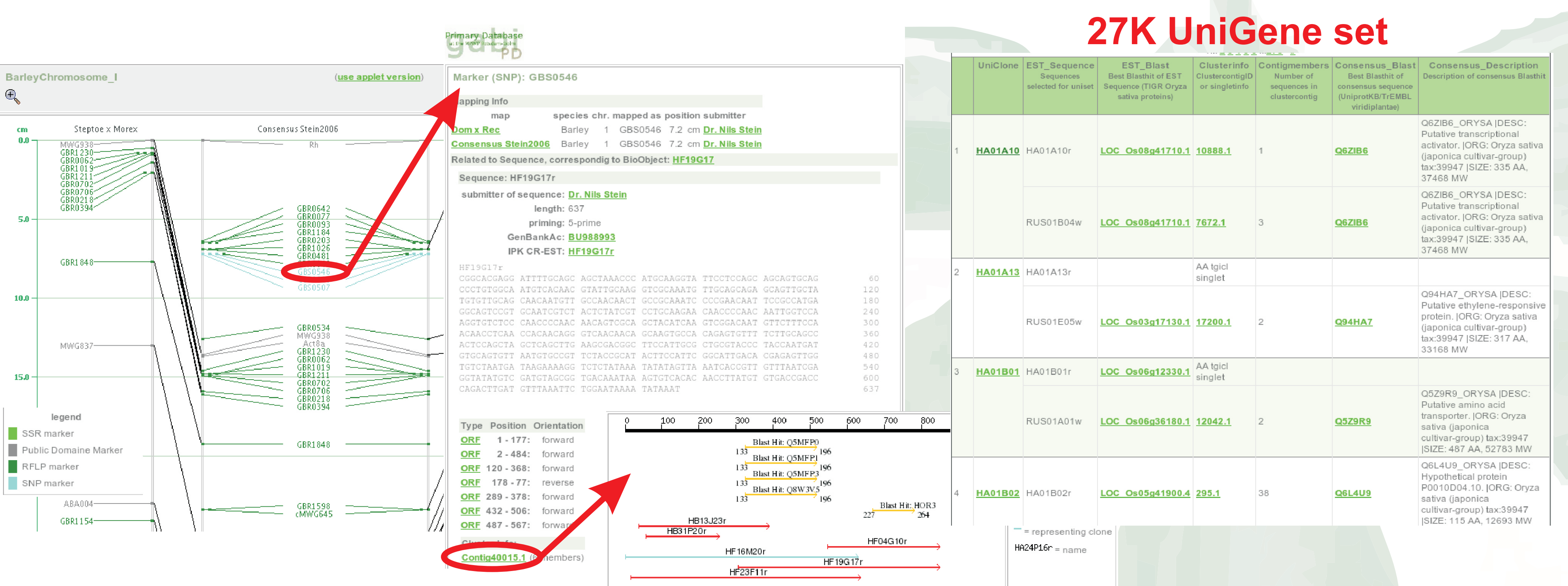
Data integration is achieved mainly through the Gene's GreenCard.

Clone and Plant (transgenic line) GreenCards point to the Gene's GreenCard through BLAST searches. The "Related with" section lists the best BLAST hits to different sources (e-value <math>10^{-10}</math>, 70% identity, 50% aligned region).

Identified proteins on 2D gels, are linked through their original MASCOT result.

Gene's GreenCards provide links to all related data, making effective bidirectional links. GreenCards are linked to other GABI (e.g., GABI-KAT), as well as external resources (e.g., PhosPhAT).

## 4. Barley's maps, and a new unigene set



Barley genetic maps are linked to ESTs through the respective markers. A clone list, enriched for full length cDNAs, representing a new 27K unigene set, was made in cooperation with the Institute of Plant Genetics and Crop Plant Research in Gatersleben (IPK). This Unigene set was built using the EST assembly programs CAP3 and TGICL, to obtain: 27729 cluster contigs, 14897 CAP3 singlets and 26956 TGICL singlets. This list and its corresponding sequences are available from the GabiPD web site.

## 5. New data in GabiPD

- + List of Barley cDNA clones from the IPK representing a new 27K UniGene Set
- + Barley EST sequences from GABI-PLANT
- + GenBank Accession numbers for 39000 Barley EST sequences from GABI-SEED and GABI-PLANT
- + Updated GABI-KAT T-DNA insertion lines and sequences (v23, 30.11.2007)
- + TAIR v7.0 Arabidopsis genome annotation
- + TAIR v7.0 BLAST hits for all GabiPD sequences from Arabidopsis

## 6. Future perspectives

- ① Potato SNP data from GABI-CONQUEST 2
- ① Condensed species-specific data overviews in order to ease navigation through the data
- ① Extend database structure, user interfaces and download functionalities for new types of GABI-FUTURE data
- ① Continuously integrate GABI-FUTURE data
- ① Arabidopsis 2DE data from GABI trilateral SARA
- ① Vitis vinifera genetic maps from the BMELV
- ① SNP data of different Arabidopsis accessions from GABI-EVAST
- ① Upgrade the 2-DE interface
- ① Perform new types of data analysis, e.g. domain analysis in proteins

## References

APG. 2003. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Bot J Linn Soc.* 141:399-436

Bohs L. 2005. Major clades in *Solanum* based on ndhF sequence data. pp 27-49 in Keating RC, Hollowell VC, and Croat TB (eds.), *A festschrift for William G. D'Arcy: the legacy of a taxonomist. Monographs in Systematic Botany from the Missouri Botanical Garden, Vol. 104.* Missouri Botanical Garden Press, St. Louis, MO

Knapp S. 2002. Tobacco to tomatoes: a phylogenetic perspective on fruit diversity in the Solanaceae. *J Exp Bot.* 53:2001-22.

Soi Genomics Network ([http://www.sgn.cornell.edu/about/about\\_solanaceae.pl](http://www.sgn.cornell.edu/about/about_solanaceae.pl))

Soltis PS and Soltis DE. 2004. The origin and diversification of angiosperms. *Am J Bot.* 91:1614

The Tree of Life (<http://www.tolweb.org/angiosperms>)

Source for figures:  
[http://en.wikipedia.org/wiki/DNA\\_microarray](http://en.wikipedia.org/wiki/DNA_microarray)  
[http://en.wikipedia.org/wiki/Image:2D\\_gel\\_images\\_dual\\_channel\\_warped.PNG](http://en.wikipedia.org/wiki/Image:2D_gel_images_dual_channel_warped.PNG)  
<http://commons.wikimedia.org/wiki/Image:Gouache-arabidopsis-thaliana.jpg>  
[http://commons.wikimedia.org/wiki/Image:Arabidopsis\\_thaliana-flower.jpg](http://commons.wikimedia.org/wiki/Image:Arabidopsis_thaliana-flower.jpg)  
<http://dmelson.utmem.edu/module5/BSA/Spectrum/BSA60ng%20.jpg>