



The SOL Genomics Network model: making community annotation work

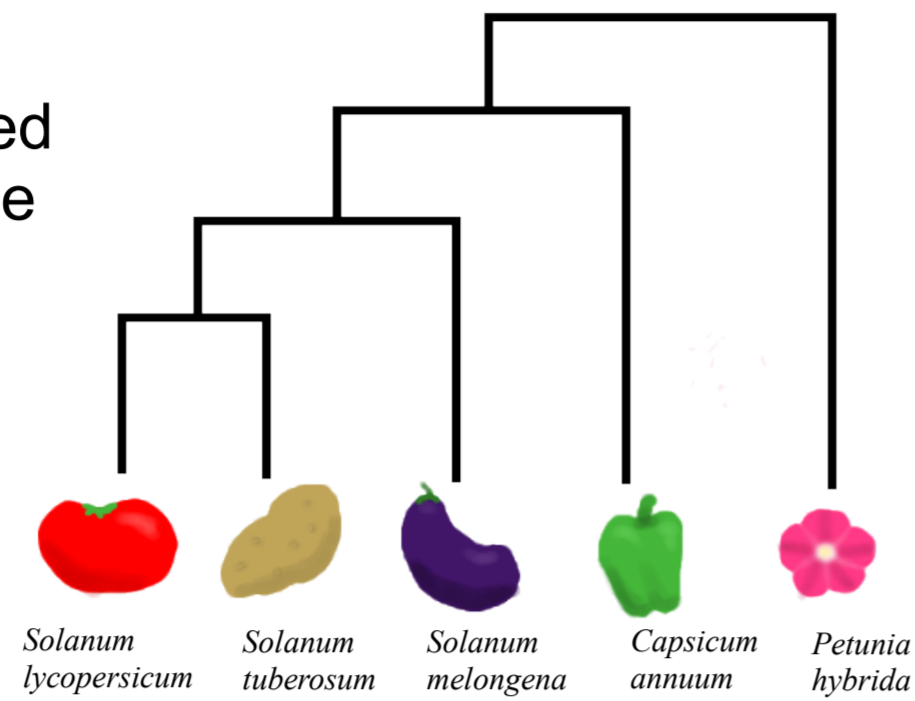


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What is SGN?

<http://sgn.cornell.edu/>

SGN is a community centric, clade-oriented database and comparative resource for the plants of the Solanaceae family. SGN houses maps, markers, sequence, locus annotation, and phenotypic data.



SGN is also part of the bioinformatics platform for the International Solanaceae Project (SOL), which is currently sequencing the euchromatic portion (about 25%) of the 850 Mb tomato genome.

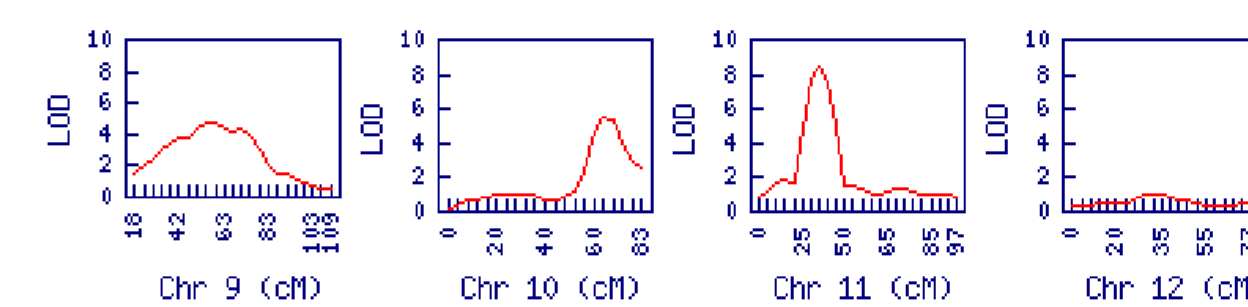
With an SGN submitter account you can contribute your data to SGN easily on the web!

Phenotype Ontology

Solanaceae-specific ontology terms, used mostly by plant biologists and breeders, for describing quantitative and qualitative traits. These terms are mapped to PO, TO, and PATO whenever applicable, allowing cross-database queries.

```
SP:0001000 Solanaceae phenotype ontology
  is a SP:0000037 fruit
    is_a SP:0000012 fruit color
      part_of SP:0000069 fruit end
        is_a SP:0000167 fruit metabolites
          is a SP:0000011 fruit morphology
            is_a SP:0000124 epicarp texture
              is_a SP:0000089 fruit locule number
                is_a SP:0000038 fruit shape
                  is_a SP:0000010 fruit size
                    is_a SP:0000106 fruit number
                      is_a SP:0000013 fruit ripening
```

SGN: fruit shape index values in population QTL Tomato Yellow Stuffer x LA1589 F2



QTLs are calculated by trait. Users can upload their dataset and run R/QTL statistics and map online their loci.

From Genomes to Phenomes

Solanaceae share conserved genomes, yet show rich phenotypic diversity. These characteristics allow us to address one of today's greatest challenges in biology: how do we reveal the phenotypes encoded by genome sequences? The clade-oriented approach is utilized for studying related species in one database.

Locus details Download GMOD XML | Note to Editors | Annotation guidelines

[New] [Edit] [Delete]

Locus name: **zeaxanthin epoxidase**
 Symbol: **zep**
 Gene activity: **zeaxanthin epoxidase**
 Description: **Enzyme that catalyzes the conversion of zeaxanthin to violaxanthin. Mutants are wilty due to abscisic acid deficiency**
 Chromosome: **2**
 Arm: **2**

Maps Tomato-EXPEN 2000

Phenotype

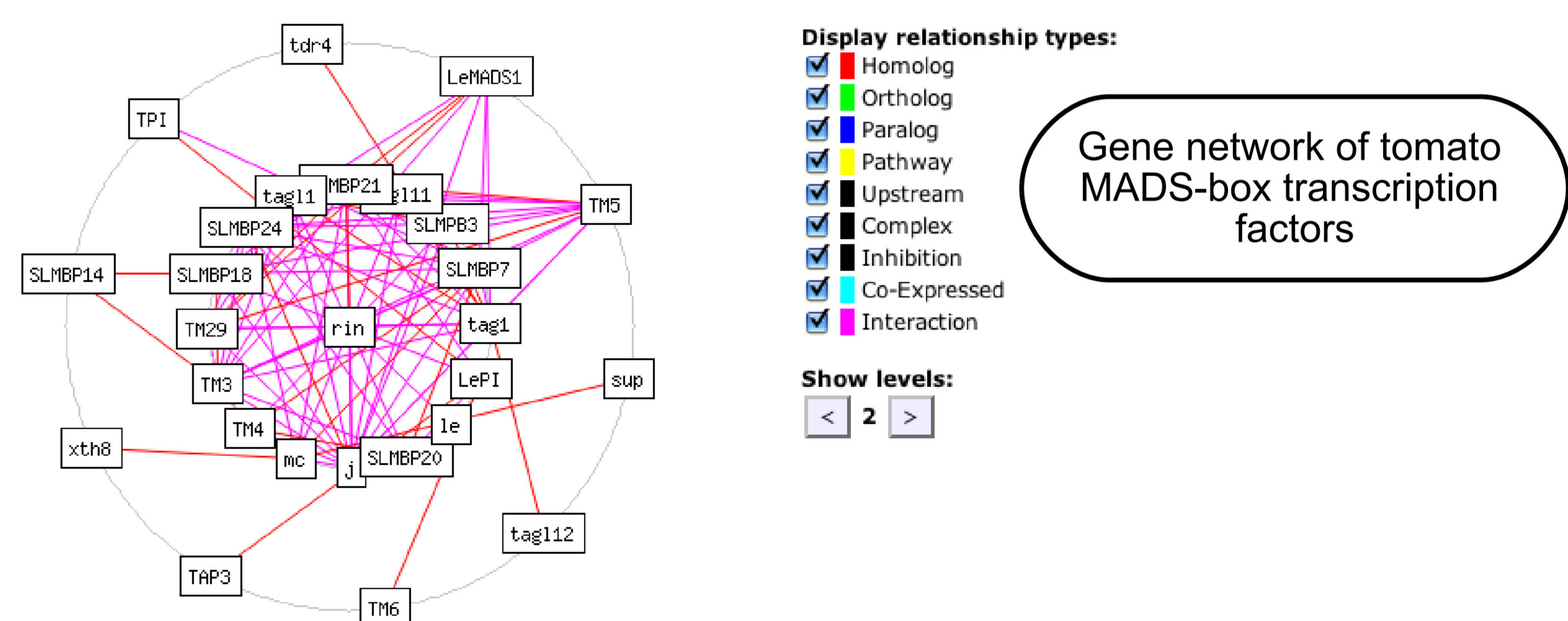
Sequences
 Predicted cDNA matched: AC215383.6.1
 Sequences matched: SGN-U321035, EU004202.1, Z83835

Pathways

SolCyc

Gene networks

Since genes occur in networks, we can learn about putative function and phenotypes based on the relationship of one gene with its orthologs, paralogs, interacting genes, and pathway members. We have developed a 'network-browser' tool for visualising the complexity of gene-to-gene relationships.



Community annotation

SGN has a web-interface shared by curators and community-users for annotating genes and phenotypes. This system keeps the database up-to-date, and creates active interactions among researchers.

Locus editors: Andrew Thompson; Navot Galpaz

[New] [Cancel Edit] [Delete]

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Edits are stored instantly in the database

Store Reset form

- Notes and figures (6)
- Accessions and images (2)
- Associated loci (1)
- Known alleles (1)
- SolCyc links (2)
- Sequence annotations (7)
- Literature annotation (3)
- Ontology annotations (12)
- User comments

Community annotation is open for submitting wide range of datatypes.

Literature mining

Publications on Solanaceae genes are indexed and matched against loci descriptors and controlled-vocabulary terms. The result is a ranked list of matching publications and a suggested list of ontology terms associated with each locus.

Publication list for locus zeaxanthin epoxidase

Suggested publication list

Latowski, D.; Kruk, J.; StrzaÅka, K (2005) Inhibition of zeaxanthin epoxidase activity by cadmium ions in higher plants. Journal of inorganic biochemistry. 99(10):2081-7 Match score = 0.349432

Audran, ; Borel, ; Frey, ; Sotta, ; Meyer, ; Simonneau, ; Marion-Poll, (1998) Expression studies of the zeaxanthin epoxidase gene in nicotiana glauca. Plant Molecular Biology 33:1183-1192 Match score = 0.257614

Bugos, RC; Hieber, AD; identified from plants...

Conclusions and future development

We have experienced positive responses for our efforts in recruiting the knowledge and expertise of the research community for gene and phenotype annotations. SGN has more than 70 active submitters who curate their favourite genes, submit phenotyping experiments, and assist in development of the phenotype ontology. We are currently seeking ways of increasing interest and participation of researchers and breeders in the task of community-driven annotation. We would also like to collaborate with Journals, and have authors submit gene data to SGN as part of the peer-reviewed publication process.

The emerging tomato genome sequence will serve as the reference genome for other Solanaceae species. The resulting increase in data and usage will be a test for SGN's ability to scale-up while continuing to closely interact with the community.

Funding sources

The following funding agencies are gratefully acknowledged:



<http://sgn.cornell.edu>

Contact SGN at sgn-feedback@sgn.cornell.edu

SGN code and software

Open Source and free to download!
The SGN community platform is portable for other organisms.
<ftp://ftp.sgn.cornell.edu>