Tripal v3, the Collaborative Online Database Platform
Supporting an International Community of Plant Genome Databases

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A web framework for genetic and genomic data

Goals:
• Simplify construction of websites that have biological data
• Encourage high-quality, standards-based websites for data sharing and collaboration
• Reuse code across databases

http://tripal.info

Tripal Core Functions

- Load, Store, and Display Chado Content
  • Organisms
  • Contacts
  • Analyses
  • Features
- Map Controlled Vocabularies
- Jobs Management
- Web Services

https://github.com/GMOD/Chado
Example Extension Modules

- Transcriptomes
- Functional annotation:
  - BLAST
  - KEGG
  - InterPro
  - Gene Ontology
- BLAST server
- Breeding API
- NCBI data Import
- Genetic and Physical Maps
- Jbrowse
- Apollo
- Galaxy
- Stocks/Germplasm
- Phenotypes
- Genotypes
- Phylogenies
- Gene expression data


How does Tripal do FAIR?

Cooperative Database Development

- Washington State University
- University of Saskatchewan
- University of Tennessee, Knoxville
- Iowa State University
- University of Connecticut
- USDA National Agricultural Library
- Bioversity International (France)

Expression Module

Need a better way to store and visualize RNASeq differential gene expression experiments.

13 code contributors
64 modules on GitHub electively tagged as tripal

Tripal loves FAIR

Why do we care?
- FAIR emphasizes helping machines to find and reuse data
- Make your life easier (biologist)
- Write new tools and code that will work with all data

Easy administration and curation

Metadata
Individual genes across samples

Users choose how to group and color samples

Expression Visualization Tool
- Paste a list of genes in to get a full heatmap across all libraries.
- Javascript allows you to zoom, download, etc.

Ontology Browser

Module Sharing:
Gene Expression Works for GDV Too

Elasticsearch Software
Open source search engine
- Features - autocomplete, fuzzy searching, "did you mean" suggestions

Tripal Elasticsearch
- Full administrative control of content indexing
- Can search all content
- Much easier for software developers to use
- Easily build advanced search forms
- Preconfigured indices for Chado data

Findable
Cross Site Querying

Conclusions

- Tripal 3 can make FAIR possible for your data
- Tripal already has lots of modules to support common data types
  - Organism, feature, expression, search
  - Tools - GMOD
- Tripal allows small communities to “have their cake and eat it too”
  - Sharing and reusing code
  - Interoperability at database and site level with other databases
  - Customizable user experience

https://www.hardwoodgenomics.org/
http://tripal.info/

Tripal Session this afternoon!