

# AgroPortal

*a proposition for ontology-  
based services in the  
agronomic domain*

*Atelier InOvive 2015 - Rennes - 29 juin 2015*

Clément Jonquet,  
Esther Dzalé-Yeumo,  
Elizabeth Arnaud,  
Pierre Larmande



**LIRMM**



**INRA**  
SCIENCE & IMPACT



**Biodiversity**  
International



Institut de recherche  
pour le développement



Institut de biologie  
computationnelle



Agence Nationale de la Recherche  
**ANR**

# Why ontologies? Why an ontology repository?

# Biologist have adopted ontologies

- ▶ To provide canonical **representation** of scientific knowledge
- ▶ To **annotate** experimental data to enable interpretation, comparison, and discovery across databases
- ▶ To facilitate **knowledge-based applications** for
  - ▶ Decision support
  - ▶ Natural language-processing
  - ▶ Data integration
- ▶ But ontologies are: spread out, in different formats, of different size, with different structures

# Working with vocabularies & ontologies - a portal please!

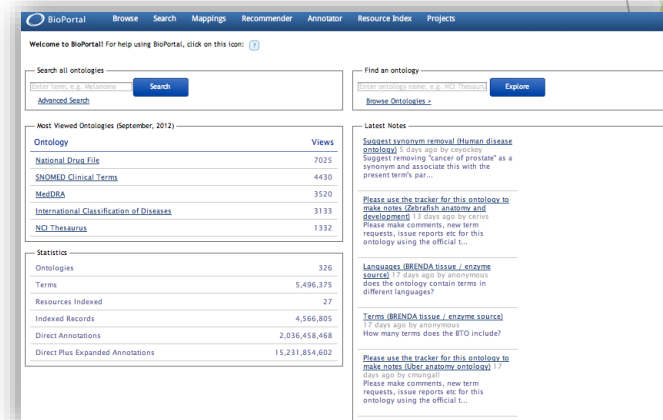
- ▶ You've built an ontology, how do you let the world know?
- ▶ You need an ontology, where do you go to get it?
- ▶ How do you know whether an ontology is any good?
- ▶ How do you find resources that are relevant to the domain of the ontology (or to specific terms)?
- ▶ How could you leverage your ontology to enable new science?
- ▶ How could you use ontologies without managing them ?

# NCBO Bioportal : A “one stop shop” for Biomedical Ontologies

- ▶ Web repository for biomedical ontologies
  - ▶ Make ontologies accessible and usable - **abstraction** on format, locations, structure, etc.
  - ▶ Users can publish, download, browse, search, comment, align ontologies and use them for annotations both online and via a web services API.

- ▶ **Online support for ontology**

- ▶ Peer review
- ▶ Notes (comments and discussion)
- ▶ Versioning
- ▶ Mapping
- ▶ Search
- ▶ Resources



# BioPortal Ontology Repository



BioPortal

Browse

Search


Mappings

Recommender

Annotator

Resource Index

Projects

Welcome to BioPortal! For help using BioPortal, click on this icon: 

Search all ontologies

Search

[Advanced Search](#)

Find an ontology

Explore

[Browse Ontologies >](#)

Most Viewed Ontologies (September, 2012)

Ontology	Views
<a href="#">National Drug File</a>	7025
<a href="#">SNOMED Clinical Terms</a>	4430
<a href="#">MedDRA</a>	3520
<a href="#">International Classification of Diseases</a>	3133
<a href="#">NCI Thesaurus</a>	1332

Statistics

Ontologies	326
Terms	5,496,375
Resources Indexed	27
Indexed Records	4,566,805
Direct Annotations	2,036,458,468
Direct Plus Expanded Annotations	15,231,854,602

Latest Notes

[Suggest synonym removal \(Human disease ontology\)](#) 5 days ago by ceyockey  
Suggest removing "cancer of prostate" as a synonym and associate this with the present term's par...

[Please use the tracker for this ontology to make notes \(Zebrafish anatomy and development\)](#) 13 days ago by cervis  
Please make comments, new term requests, issue reports etc for this ontology using the official t...

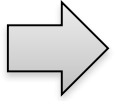
[Languages \(BRENDA tissue / enzyme source\)](#) 17 days ago by anonymous  
does the ontology contain terms in different languages?

[Terms \(BRENDA tissue / enzyme source\)](#) 17 days ago by anonymous  
How many terms does the BTO include?

[Please use the tracker for this ontology to make notes \(Uber anatomy ontology\)](#) 17 days ago by cmungall  
Please make comments, new term requests, issue reports etc for this ontology using the official t...

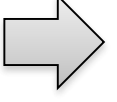
<http://bioportal.bioontology.org>

### Ontology Services



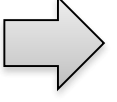
- Search
- Traverse
- Comment
- Download

### Mapping Services



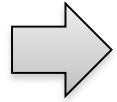
- Create
- Upload
- Download

### Widgets



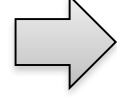
- Tree-view
- Auto-complete
- Graph-view

### Annotation

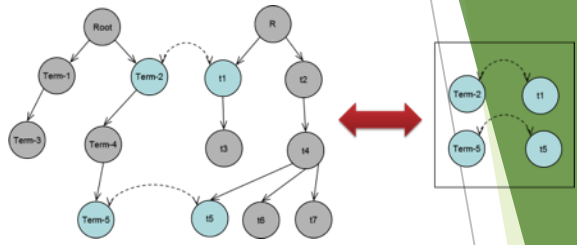
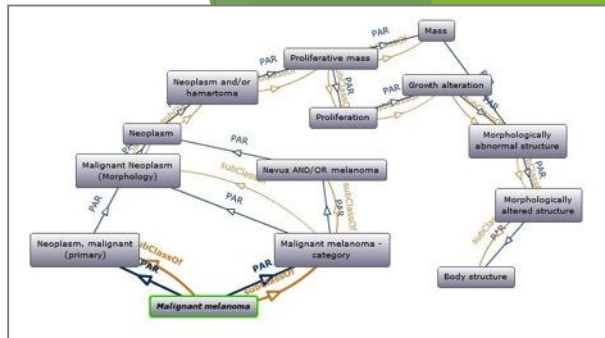


Term recognition

### Data Access



Search "data" annotated with a given term

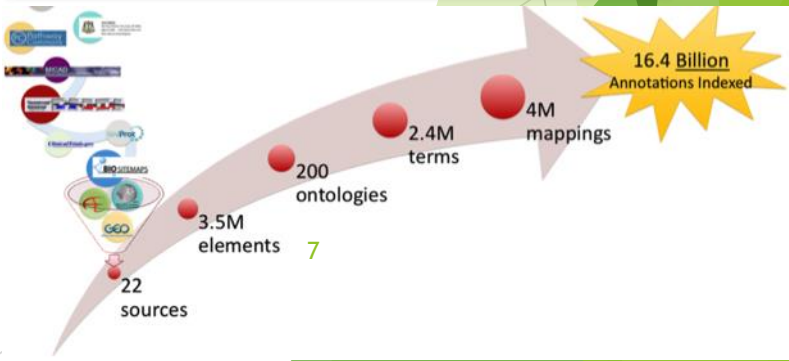


Jump To:

**Legend**

- Malignant **melanoma** (synonym)
- Amelanotic **melanoma** (preferred name)
- Excision of **melanoma** (preferred name)
- Melanoma in situ** (preferred name)
- Melanoma vaccine** (preferred name)

Expression, Expression of bladder, bladder, smooth, bladder muscle, muscle, smooth muscle, cells, mechanical, mechanical stimulation, stimulation, Chronic, results, bladder overdistension, associated, associated with, with, loss, genes, altered



# Why don't have a portal like the NCBO BioPortal for the agronomic & plant domain?

- ▶ NCBO BioPortal is specific for health and biomedical ontologies
  - ▶ Overlaps exist (GO, ENVO, PATO, SIO, BFO...)
  - ▶ But many plant/agro related ontologies are not covered
- ▶ NCBO technology is domain-independent and open source
  - ▶ Virtual appliance



# A few ontologies used in agronomic sciences

- ▶ Already in NCBO BioPortal
  - ▶ Plant Ontology, Plant Trait Ontology,
  - ▶ GO, SIO, PATO, ENVO, EFO, CL, etc.
- ▶ Not in
  - ▶ Crop Ontologies
    - ▶ Rice trait ontology, Wheat trait ontology, Wheat Anatomy & Development Ontology, Multicrop passport ontology, Bioversity molecular markers ontology
  - ▶ Other
    - ▶ Agrovoc
    - ▶ Anaee thesaurus
    - ▶ National Agriculture Library thesaurus
    - ▶ Feature annotation location description ontology

# Objectives of AgroPortal project

- ▶ Develop and support a reference ontology repository for the agronomic domain
  - ▶ One-stop-shop for plant/agronomic related ontologies
  - ▶ Primary focus on the agronomic & plant domain
- ▶ Reusing the NCBO BioPortal technology
  - ▶ Avoid to re-implement what has been done
  - ▶ Facilitate interoperability
  - ▶ Reusing the scientific outcomes, experience & methods of the biomedical domain
- ▶ Enable straightforward use of agronomic related ontologies
  - ▶ Respect the requirements of the agronomic community
  - ▶ Fully semantic web compliant infrastructure

# How does it looks?

Use AgroPortal to access and share ontologies. You can [create ontology-based annotations for your own text](#), [link your own project that uses ontologies to the description of those ontologies](#), [find and create relations between terms in different ontologies](#), review and comment on ontologies and their components as you [browse](#) them. [Sign in to AgroPortal](#) to submit a new ontology or ontology-based project, provide comments on ontologies or add ontology mappings.

**Search all ontologies**

[Search](#)

[Advanced Search](#)

**Find an ontology**

[Explore](#)

[Browse Ontologies >](#)

**Search resources**

[Search](#)

[Advanced Resource Search](#)

**Statistics**

Ontologies	29
Classes	990,959

**Latest Notes**

[object quality \(Phenotypic Quality Ontology\)](#)  
about 19 hours ago by emonet  
What is the difference with object quality or process quality? To which object those this quality...

---

[quality vs trait \(Phenotypic Quality Ontology\)](#)  
about 20 hours ago by jonquet  
Is this ok in PATO to have 'trait' as a synonym of quality?

**Latest Mappings**

[tissue \(BT\) <=> tissue \(CL\)](#)  
REST Mapping 06/24/2015 by jonquet

---

[tissue \(CL\) <=> tissue \(BT\)](#)  
REST Mapping 06/24/2015 by jonquet



# Browse

Access all ontologies that are available in IBC AgroPortal: You can filter this list by category to display ontologies relevant for a certain domain. You can also filter ontologies that belong to a certain group. [Subscribe to the IBC AgroPortal RSS feed](#) to receive alerts for submissions of new ontologies, new versions of ontologies, new notes, and new projects. You can subscribe to feeds for a specific ontology at the individual ontology page. Add a new ontology to IBC AgroPortal using the Submit New Ontology link (you need to [sign in](#) to see this link).

Search...

Showing 29 of 29 Sort: Popular

Submit New Ontology

### Entry Type

- Ontology** (29)
- Ontology View (0)
- CIMI Model (0)
- NLM Value Set (0)

### Uploaded in the Last

▼

### Category

- 010-089 General Germplasm (1)
- 100-299 Plant Anatomy and De...
- 300-499 Phenotype and Trait (0)
- 500-699 Structural and Functio...
- 700-799 Location and Environ...
- Crop Ontology (4)
- Reference ontologies for plant...

### Group

- CROP (5)
- LOVINRA (2)
- RICE (8)
- WHEAT (22)

### Format

- OBO (15)
- OWL (11)
- SKOS (1)
- UMLS (2)

## Semanticscience Integrated Ontology (SIO)

The semanticscience integrated ontology (SIO) provides a simple, integrated upper level ontology (types, relations) for consistent knowledge representation across physical, processual and informational entities

Uploaded: 6/23/15

classes

1,471

## AnaEE France Thesaurus (ANAEEF)

AnaEE is an EU science infrastructure project whose goal is to overcome the current fragmentation of ecosystem research in Europe by setting up a coordinated ensemble of experimental fora (ExpeER, AnaEE-S)

Uploaded: 6/24/15

classes

2

## Plant Trait Ontology (PTO)

A controlled vocabulary to describe phenotypic traits in plants

Uploaded: 6/23/15

classes

1,337

## CGIAR Wheat Trait Ontology (CO\_321)

CIMMYT - Wheat - September 2014

Uploaded: 6/24/15

classes

640

## Feature Annotation Location Description Ontology (FALDO)

FALDO is the Feature Annotation Location Description Ontology

Uploaded: 6/23/15

classes

18

# Available ontologies

- ▶ Already 29 ontologies... and we expect around 40 soon.
  - ▶ (half are not included in the NCBO BioPortal)
- ▶ Ontologies are organized in Groups and Categories

## Group

- CROP (5)
- LOVINRA (2)
- RICE (8)
- WHEAT (22)

## Category

- 010-089 General Germplasm (1)
- 100-299 Plant Anatomy and De...
- 300-499 Phenotype and Trait (0)
- 500-699 Structural and Functio...
- 700-799 Location and Environ...
- Crop Ontology (4)
- Reference ontologies for plant...

agroportal.lirmm.fr/ontologies/ANAEEF

Rechercher

AgroPortal LIRMM

Browse Search Mappings Recommender Annotator Projects

Recently Viewed test Help Feedback

# AnaEE France Thesaurus

Summary Classes Properties Notes Mappings Widgets

## Details

ACRONYM	ANAEEF
VISIBILITY	Public
DESCRIPTION	AnaEE is an EU science infrastructure project whose goal is to overcome the current fragmentation of ecosystem research in Europe by setting up a coordinated ensemble of experimental fora (ExpeER, AnaEE-S). They are mandated to test, analyse and model ecosystem reactions to climate changes and to develop appropriate management techniques.
STATUS	Beta
FORMAT	SKOS
CONTACT	Esther Dzalé, edzale@versailles.inra.fr
HOME PAGE	<a href="http://ist.blogs.inra.fr/lovinra/">http://ist.blogs.inra.fr/lovinra/</a>
PUBLICATIONS PAGE	
DOCUMENTATION PAGE	
CATEGORIES	
GROUPS	INRA Linked Open Vocabularies

## Metrics ?

NUMBER OF CLASSES:	2
NUMBER OF INDIVIDUALS:	3333
NUMBER OF PROPERTIES:	0
MAXIMUM DEPTH:	0
MAXIMUM NUMBER OF CHILDREN:	2
AVERAGE NUMBER OF CHILDREN:	2
CLASSES WITH A SINGLE CHILD:	0
CLASSES WITH MORE THAN 25 CHILDREN:	0
CLASSES WITH NO DEFINITION:	2

## Reviews

[Add your review](#)

No reviews available.

## Submissions

SUBMISSION	RELEASE DATE	UPLOAD DATE	DOWNLOADS
<a href="#">2014</a> (Parsed, Indexed, Metrics, Annotator)	02/18/2014	06/24/2015	<a href="#">SKOS</a>   <a href="#">CSV</a>   <a href="#">RDF/XML</a>

## Views

[Create new view](#)

No views available.

## Projects Using This Ontology

[Create new project](#)

No projects available.

15

### Annotator

The IBC AgroPortal Annotator processes text s...  
ontology-based annotations. Hover the mouse

Subscribe to the [NCBO Annotator Users Google](#)

Trait description. Increased plant size. Normal and long leaves, from yellow-green to dark green flowering state, big / long spikelets, long and (temporarily). Decreased plant size, with or without leaves, normal to narrow and small leaves (short tillering, late flowering, normal to small spikelets or without sterility (empty seed). Decreased number of tillers Upper leaf base rolled site of lower leaf Size of leaves varied. Short flag leaf Plants show lodging Brittle culm, plant fine culms.

#### Select Ontologies

Type here to select ontologies or leave blank

#### Select UMLS Semantic Types

Type here to select UMLS semantic types

- Match Longest Only  Include Mapping
- Exclude Numbers  Match Partial Words
- Exclude Synonyms

Include Ancestors Up To Level:

Include Score:

[Get Annotations](#)

### Annotations

total results 338 (direct 155 / ancestor 183 / mapping 0)

CLASS <a href="#">filter</a>	ONTOLOGY <a href="#">filter</a>	TYPE <a href="#">filter</a>	CONTEXT	MATCHED CLASS <a href="#">filter</a>	MATCHED ONTOLOGY <a href="#">filter</a>	SCORE <a href="#">▼</a>
<a href="#">dark green</a>	<a href="#">Phenotypic Quality Ontology</a>	direct	... yellow-green to <b>dark green</b> color or normal ...	<a href="#">dark green</a>	<a href="#">Phenotypic Quality Ontology</a>	8.644
<a href="#">dark green</a>	<a href="#">Phenotypic Quality Ontology</a>	direct	... or without <b>dark green</b> , rolled to semi-rolled ...	<a href="#">dark green</a>	<a href="#">Phenotypic Quality Ontology</a>	8.644
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	direct	... flowering state, <b>big</b> / long spikelets, ...	<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	direct	... small and/or <b>big</b> flag leaf Plants ...	<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... wide and <b>long</b> leaves, from yellow-green ...	<a href="#">increased length</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... big / <b>long</b> spikelets, long and/or ...	<a href="#">increased length</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... long spikelets, <b>long</b> and/or wide panicle, ...	<a href="#">increased length</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... first leaf <b>long</b> and weak. Upper ...	<a href="#">increased length</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... Short and/or <b>long</b> and/or wide and/or ...	<a href="#">increased length</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... tillers, <b>wide</b> and long leaves, ...	<a href="#">increased width</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... long and/or <b>wide</b> panicle, with or ...	<a href="#">increased width</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... stems or <b>increased width</b> in culm Increased ...	<a href="#">increased width</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... long and/or <b>wide</b> and/or narrow and/or ...	<a href="#">increased width</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... Normal to <b>stout</b> stems, normally or ...	<a href="#">increased thickness</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">increased size</a>	<a href="#">Phenotypic Quality Ontology</a>	ancestor	... normal to <b>stout</b> stems or increased ...	<a href="#">increased thickness</a>	<a href="#">Phenotypic Quality Ontology</a>	6.871
<a href="#">flag leaf</a>	<a href="#">Experimental Factor Ontology</a>	direct	... and/or big <b>flag leaf</b> Plants show lodging ...	<a href="#">flag leaf</a>	<a href="#">Experimental Factor Ontology</a>	6.644
<a href="#">flag leaf</a>	<a href="#">Plant Ontology</a>	direct	... and/or big <b>flag leaf</b> Plants show lodging ...	<a href="#">flag leaf</a>	<a href="#">Plant Ontology</a>	6.644
<a href="#">normal</a>	<a href="#">Phenotypic Quality Ontology</a>	direct	... plant size. <b>Normal</b> to stout stems, ...	<a href="#">normal</a>	<a href="#">Phenotypic Quality Ontology</a>	6.459
<a href="#">normal</a>	<a href="#">Phenotypic Quality Ontology</a>	direct	... color or <b>normal</b> to light green, ...	<a href="#">normal</a>	<a href="#">Phenotypic Quality Ontology</a>	6.459



## Ontology Recommender

Get recommendations for the most relevant ontologies based on an excerpt from a biomedical text or a list of keywords ?

**Input** **Output**

Text  Keywords (separated by commas)  Ontologies  Ontology sets

insert sample input

**Trait** description: **Increased** plant **size** **Normal** to **stout** stems, normally or semi-openly **distributed** tillers, **wide** and **long** leaves, from **yellow green** to **dark green color** or **normal** to **light green** **erect** leaves due to **late** flowering state. **big / long** spikelets, **long** and/or **wide** panicle, with or without panicles incompletely **exserted** (temporarily). **Decreased** plant **size** with or without **dark green** rolled to semi-rolled leaves, **normal** to **twisted** leaves, **normal** to **narrow** and **small** leaves (shorter leaves than **average size** leaves), **normal** to **erect** leaves, **low** tillering, **late** flowering, **normal** to **small** spikelets, **normal** to panicles incompletely **exserted** (temporarily), with or without sterility (empty seed). **Decreased number of** tillers, **normal** to **stout** stems or **Increased width** in culm. **Increased number of** tillers Upper leaf base rolled, the first leaf **long** and **weak** Upper leaf emerging by sheath site of lower leaf **Size** of leaves varied. **Short** and/or **long** and/or **wide** and/or **narrow** and/or **small** and/or **big** flag leaf Plants show lodging **Brittle** culm, plant shatter after moderate winds **Twisted** stem. Many tillers with fine culms.

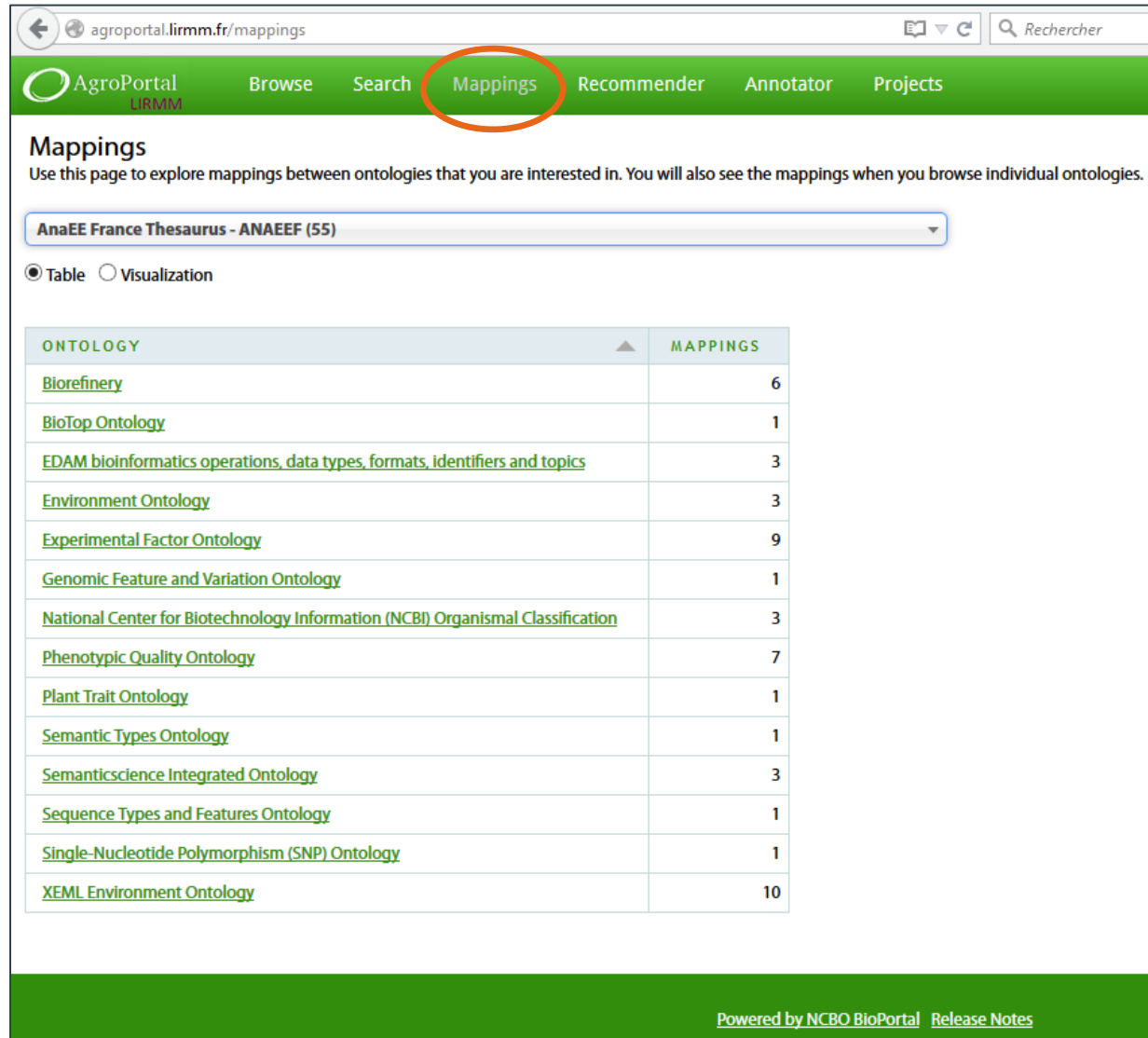
advanced options

[Edit Input](#)

### Recommended ontologies

POS.	ONTOLOGY	FINAL SCORE	COVERAGE SCORE	ACCEPTANCE SCORE	DETAIL SCORE	SPECIALIZATION SCORE	ANNOTATIONS	HIGHLIGHT ANNOTATIONS
1	<a href="#">PATO</a>	61.0	66.0	0.0	64.6	100.0	55	<input checked="" type="checkbox"/>
2	<a href="#">PO</a>	24.6	15.8	0.0	87.5	18.6	11	<input type="checkbox"/>
3	<a href="#">EFO</a>	23.4	26.2	0.0	39.0	20.9	20	<input type="checkbox"/>
4	<a href="#">SIO</a>	20.3	26.0	0.0	12.0	28.1	22	<input type="checkbox"/>
5	<a href="#">CO_125</a>	12.2	7.1	0.0	47.1	7.9	6	<input type="checkbox"/>
6	<a href="#">ENVO</a>	12.2	0.6	0.0	77.8	1.0	1	<input type="checkbox"/>
7	<a href="#">PTO</a>	12.1	7.6	0.0	47.1	5.8	2	<input type="checkbox"/>
8	<a href="#">VARIO</a>	11.3	5.9	0.0	47.1	6.7	5	<input type="checkbox"/>
9	<a href="#">GO</a>	10.7	1.2	0.0	66.0	1.2	2	<input type="checkbox"/>
10	<a href="#">CL</a>	10.5	4.7	0.0	49.0	3.8	4	<input type="checkbox"/>
11	<a href="#">CO_321</a>	7.3	2.4	0.0	37.9	1.8	2	<input type="checkbox"/>
12	<a href="#">EDAM</a>	7.2	2.4	0.0	37.3	2.0	2	<input type="checkbox"/>
13	<a href="#">PCO</a>	6.8	2.4	0.0	34.3	2.4	2	<input type="checkbox"/>

# Mappings



agroportal.lirmm.fr/mappings

AgroPortal LIRMM

Browse Search **Mappings** Recommender Annotator Projects

## Mappings

Use this page to explore mappings between ontologies that you are interested in. You will also see the mappings when you browse individual ontologies.

AnaEE France Thesaurus - ANAEEF (55)

Table  Visualization

ONTOLOGY ▲	MAPPINGS
<a href="#">Biorefinery</a>	6
<a href="#">BioTop Ontology</a>	1
<a href="#">EDAM bioinformatics operations, data types, formats, identifiers and topics</a>	3
<a href="#">Environment Ontology</a>	3
<a href="#">Experimental Factor Ontology</a>	9
<a href="#">Genomic Feature and Variation Ontology</a>	1
<a href="#">National Center for Biotechnology Information (NCBI) Organismal Classification</a>	3
<a href="#">Phenotypic Quality Ontology</a>	7
<a href="#">Plant Trait Ontology</a>	1
<a href="#">Semantic Types Ontology</a>	1
<a href="#">Semanticscience Integrated Ontology</a>	3
<a href="#">Sequence Types and Features Ontology</a>	1
<a href="#">Single-Nucleotide Polymorphism (SNP) Ontology</a>	1
<a href="#">XEML Environment Ontology</a>	10

Powered by NCBO BioPortal | [Release Notes](#)

# Community based functionalities

## Latest Mappings

[tissue \(BT\) <=> tissue \(CL\)](#)

REST Mapping 06/24/2015 by jonquet

[tissue \(CL\) <=> tissue \(BT\)](#)

REST Mapping 06/24/2015 by jonquet

## Latest Notes

[object quality \(Phenotypic Quality Ontology\)](#)

about 19 hours ago by emonet

What is the difference with object quality or process quality? To which object those this quality...

[quality vs trait \(Phenotypic Quality Ontology\)](#)

about 20 hours ago by jonquet

Is this ok in PATO to have 'trait' as a synonym of quality?

agroportal.lirmm.fr/projects

Rechercher

AgroPortal LIRMM

Browse Search Mappings Recommender Annotator **Projects** Recently Viewed test Help Feedback

### Projects

Browse the ontology-based projects in the community: Each project description is linked to IBC AgroPortal ontologies that the project uses. Use the 'Add Project' link to add your ontology-based project to this list and to link it to IBC AgroPortal ontologies. Your project will then appear on the pages that list the details for the ontologies that you selected. We also invite you to review ontologies that you used in your project.

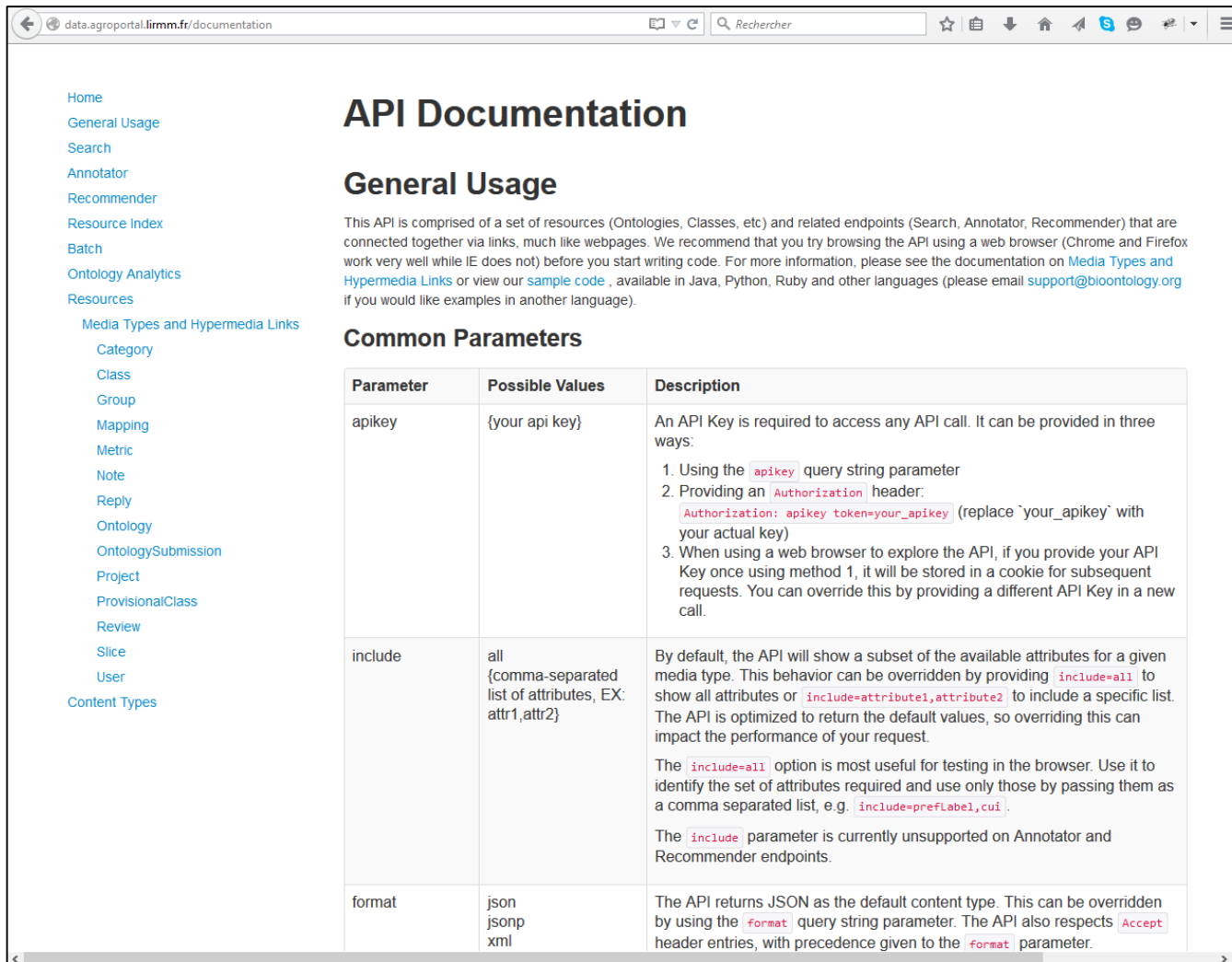
Create New Project

PROJECT	DESCRIPTION	CONTACTS	INSTITUTIONS	ONTOLOGIES
<a href="#">Computational Biology Institute</a> <a href="#">Home Page</a>	Modeling, processing and analysis of large scale data in biology, health, agronomy and environment.	Pierre Larmande	University of Montpellier, CNRS, CIRAD, INRIA, IRD, INRA, SupAgro, INSERM	0
<a href="#">Labex Numev</a> <a href="#">Home Page</a>	The Numev Labex was created within the greater construct of rallying the MIPS community (Mathematics, Computer Science, Physics, Systems) around the objective of tackling organic life, health and environmental issues.	Clément Jonquet	University of Montpellier, CNRS, INRIA, INRA, SupAgro	0
<a href="#">Semantic Indexing of French Biomedical Data Resources</a> <a href="#">Home Page</a>	The SIFR project proposes to investigate the scientific and technical challenges in building ontology-based services to leverage biomedical ontologies and terminologies in indexing, mining and retrieval of French biomedical data.	Clément Jonquet	LIRMM (University of Montpellier & CNRS)	0

Powered by NCBO BioPortal | [Release Notes](#)

# REST Web Service API:

<http://data.agroportal.lirmm.fr/documentation>



The screenshot shows a web browser window with the URL `data.agroportal.lirmm.fr/documentation`. The page title is "API Documentation" and the main heading is "General Usage". Below this, there is a paragraph explaining the API's components and a section titled "Common Parameters" which contains a table with three rows: "apikey", "include", and "format".

## API Documentation

### General Usage

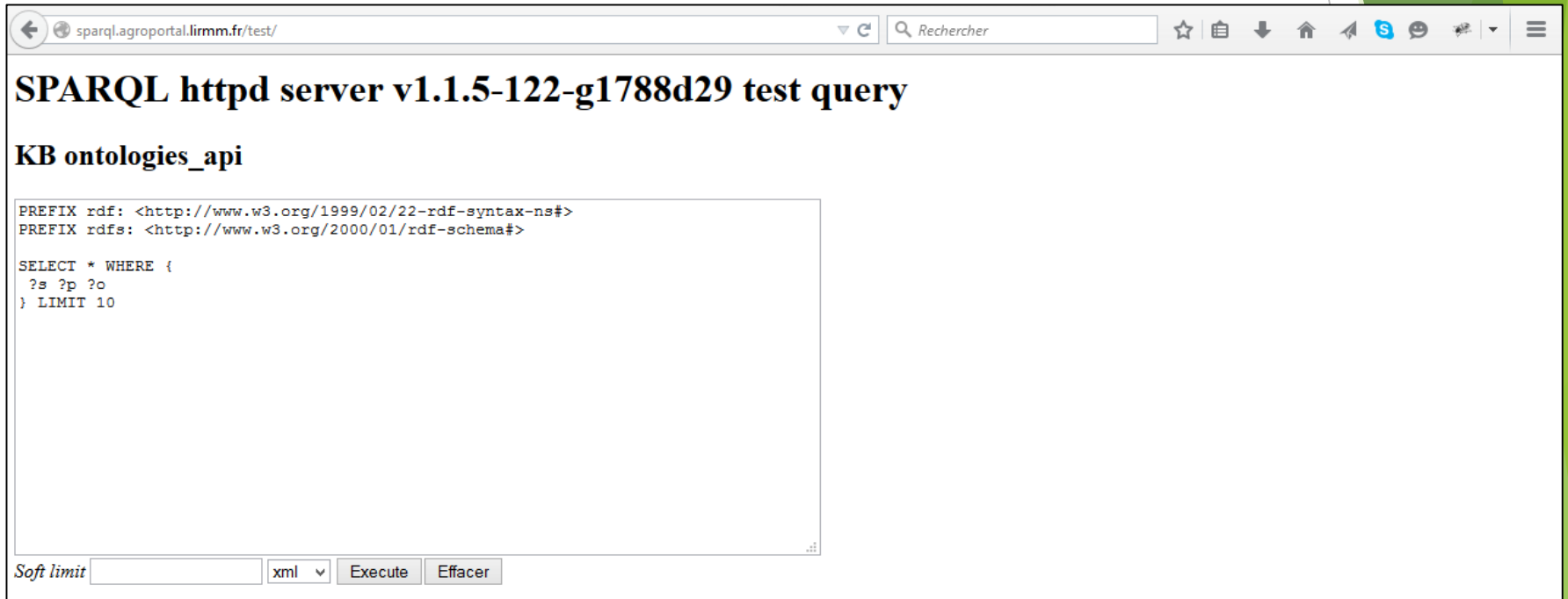
This API is comprised of a set of resources (Ontologies, Classes, etc) and related endpoints (Search, Annotator, Recommender) that are connected together via links, much like webpages. We recommend that you try browsing the API using a web browser (Chrome and Firefox work very well while IE does not) before you start writing code. For more information, please see the documentation on [Media Types and Hypermedia Links](#) or view our [sample code](#), available in Java, Python, Ruby and other languages (please email [support@bioontology.org](mailto:support@bioontology.org) if you would like examples in another language).

### Common Parameters

Parameter	Possible Values	Description
apikey	{your api key}	An API Key is required to access any API call. It can be provided in three ways: <ol style="list-style-type: none"><li>Using the <code>apikey</code> query string parameter</li><li>Providing an <code>Authorization</code> header: <code>Authorization: apikey token=your_apikey</code> (replace <code>'your_apikey'</code> with your actual key)</li><li>When using a web browser to explore the API, if you provide your API Key once using method 1, it will be stored in a cookie for subsequent requests. You can override this by providing a different API Key in a new call.</li></ol>
include	all {comma-separated list of attributes, EX: attr1,attr2}	By default, the API will show a subset of the available attributes for a given media type. This behavior can be overridden by providing <code>include=all</code> to show all attributes or <code>include=attribute1,attribute2</code> to include a specific list. The API is optimized to return the default values, so overriding this can impact the performance of your request.  The <code>include=all</code> option is most useful for testing in the browser. Use it to identify the set of attributes required and use only those by passing them as a comma separated list, e.g. <code>include=prefLabel1,cui</code> .  The <code>include</code> parameter is currently unsupported on Annotator and Recommender endpoints.
format	json jsonp xml	The API returns JSON as the default content type. This can be overridden by using the <code>format</code> query string parameter. The API also respects <code>Accept</code> header entries, with precedence given to the <code>format</code> parameter.

# SPARQL endpoint:

<http://sparql.agroportal.lirmm.fr>



The screenshot shows a web browser window with the address bar containing `sparql.agroportal.lirmm.fr/test/`. The page title is **SPARQL httpd server v1.1.5-122-g1788d29 test query**. Below the title, the text **KB ontologies\_api** is displayed. A text area contains the following SPARQL query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT * WHERE {
  ?s ?p ?o
} LIMIT 10
```

At the bottom of the interface, there is a **Soft limit** input field, a dropdown menu set to **xml**, and two buttons labeled **Execute** and **Effacer**.

# An ontology repository... who's gonna use it?

# 4 Driving Agronomic Use Cases

## ▶ IBC Rice Genomics

- ▶ data integration and knowledge management related to rice



## ▶ RDA Wheat Data Interoperability working group

- ▶ common framework for describing, representing, linking and publishing wheat data with respect to open standards



## ▶ INRA Linked Open Vocabularies, LovInra

- ▶ publish vocabularies produced or co-produced by INRA scientists and foster their reuse beyond the original researchers



## ▶ The Crop Ontology project

- ▶ publishes ontologies required for describing crop germplasm, traits and evaluation trials.



# Each use case has a specific group in AgroPortal

## Group

- CROP (5)
- LOVINRA (2)
- RICE (8)
- WHEAT (22)

- ▶ Feature to come: slices
  - ▶ Specific “entry” in the AgroPortal






# Cropontology.org

www.cropontology.org

## Crop Ontology Curation Tool

Home About Users Feedback



**Integrated Breeding Platform**  
Today's tools for tomorrow's crops.

**New:** Crop Ontology contributes to Planteome project ( NSF-awarded project #1340112)  
Guidelines are available at the [Crop Ontology wiki](#)  
[Crop Trait Dictionary Upload Template Version 4 \(click to download\)](#)  
Find the code of your crop ontology on the [GCP Pantheon](#).  
Icons appearing on the homepage next to each ontology will let you download the ontology in [RDF/Turtle](#) format.  
Crop Ontology Community Web Site at: <http://tiny.cc/rw51ax>  
Check [Semantics for Biodiversity](#) web site

Search

[Add New Terms](#) [API](#) [Help](#) [Agtrials](#) [Annotation Tool](#) [Register](#) [Login](#)

Latest

OBO Ontology  Trait Dictionary

### General Germplasm Ontology

**FAO/IPGRI Multi-Crop Passport Descriptor** 87 terms [SHRESTHA](#)  
FAO/IPGRI Multi-Crop Passport Descriptor

**Germplasm** 386 terms [SHRESTHA](#)  
germplasm

**ICIS germplasm method** 166 terms [SHRESTHA](#)  
ICIS germplasm methods

### Phenotype and Trait Ontology

**Banana** 52 terms [IVANDENBERGH](#)  
Banana beta version

**Barley Trait Dictionary** 76 terms [RPSVERMA](#)  
ICARDA - Trait Dictionary Version Beta

**Barley Trait POLAPGEN Ontology** 148 terms [HCWI](#)  
Barley Trait Ontology 6 June 2013 submitted by the Institute of Plant Genetics Poznan on behalf of Polapgen Consortium Poland

**Cacao** 8 terms [CACAOINET](#)  
DRAFT - Cacao Ontology

**Cassava** 205 terms [AAFOLABI](#)  
IITA - Cassava Ontology - September 2014

**Chickpea** 84 terms [PWACAT](#)

### Location and Environmental Ontology

**Country and Location** 1118 terms [SHRESTHA](#)  
Describes official ISO 3166-1 alpha-2, alpha-3 and numeric country codes along with location names.

**Crop Research** 256 terms [SHRESTHA](#)  
Describes experimental design, environmental conditions and methods associated with the crop study/experiment/trail and their evaluation.

### Plant Anatomy & Development Ontology

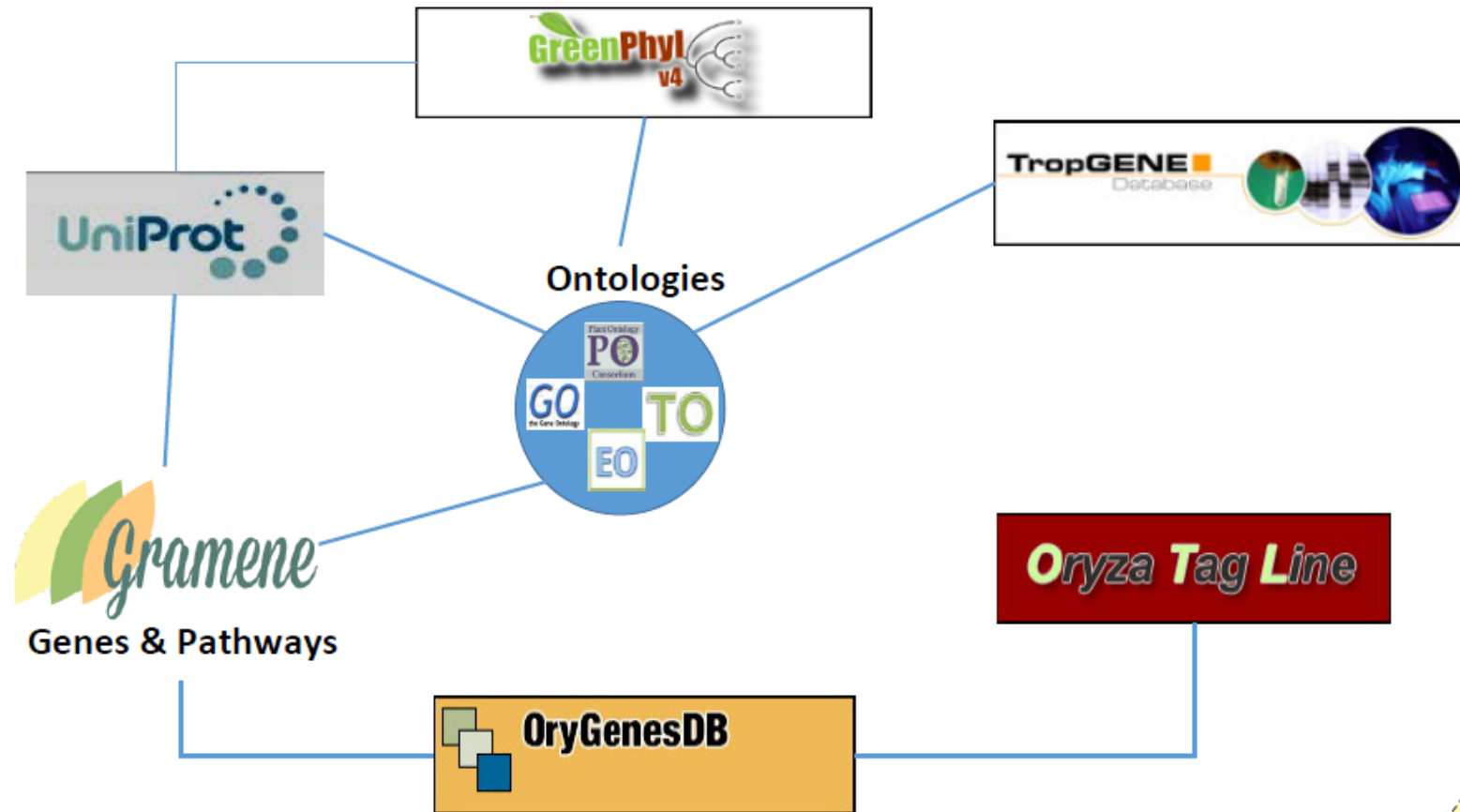
**Banana Anatomy** 149 terms [ELIZABETHARNAUD](#)  
Banana Anatomy

**Plant Ontology** 1710 terms [COOPER](#)  
The Plant Ontology describes plant anatomy and morphology and stages of development for all plants. The goal of the PO is to establish a semantic framework for meaningful cross-species queries across gene expression and phenotype data sets from plant genomics and genetics experiments.

**Wheat Plant Anatomy and Development Ontology** 77 terms [SHRESTHA](#)  
Defines growth stages of wheat

# Agronomic Linked Data (AgroLD)

- ▶ Public SPARQL endpoint:  
<http://volvestre.cirad.fr:8890/sparql>



# Other projects interested

- ▶ Planteome ([www.planteome.org](http://www.planteome.org))
  - ▶ Development and enrichment of new and existing reference ontologies for plants
  - ▶ Data annotation
- ▶ iPlantCollaborative ([www.iplantcollaborative.org](http://www.iplantcollaborative.org))
- ▶ Elixir ([www.elixir-europe.org](http://www.elixir-europe.org))
  - ▶ US and EU cyberinfrastructure for life science
- ▶ IFB platforms ([www.france-bioinformatique.fr](http://www.france-bioinformatique.fr))
  - ▶ (SouthGrenn, URGI, PlantNode, etc.)

# Conclusion

# AgroPortal is a starting project

- ▶ A platform for ontology publication (≠edition or curation)
- ▶ We expect it to become a reference platform
- ▶ One-stop-shop for plant/agronomic related ontologies
- ▶ Reuse NCBO technology and focus on customization and new science

Sign up and join us with your ontologies, feedback!

<http://agroportal.lirmm.fr>