

AgroPortal: a vocabulary and ontology repository for agronomy



Séminaire INRAE Semantic Linked Data

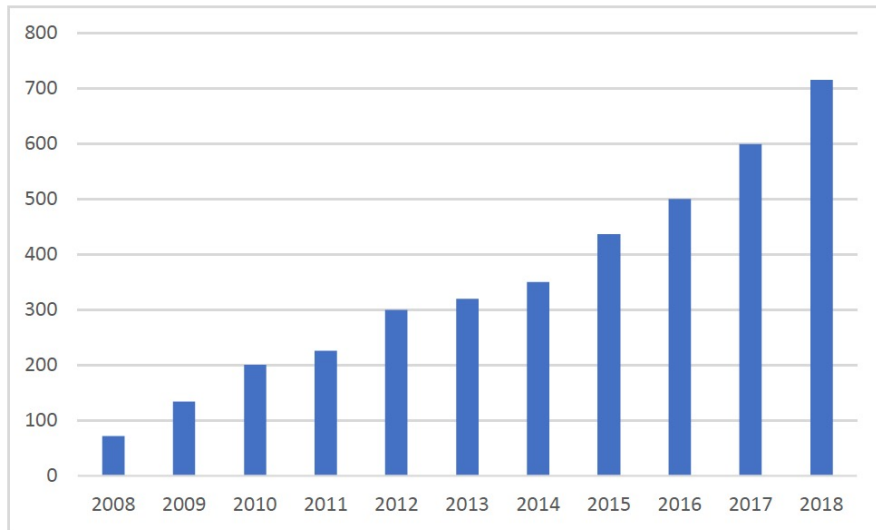
Clement Jonquet

clement.jonquet@inrae.fr

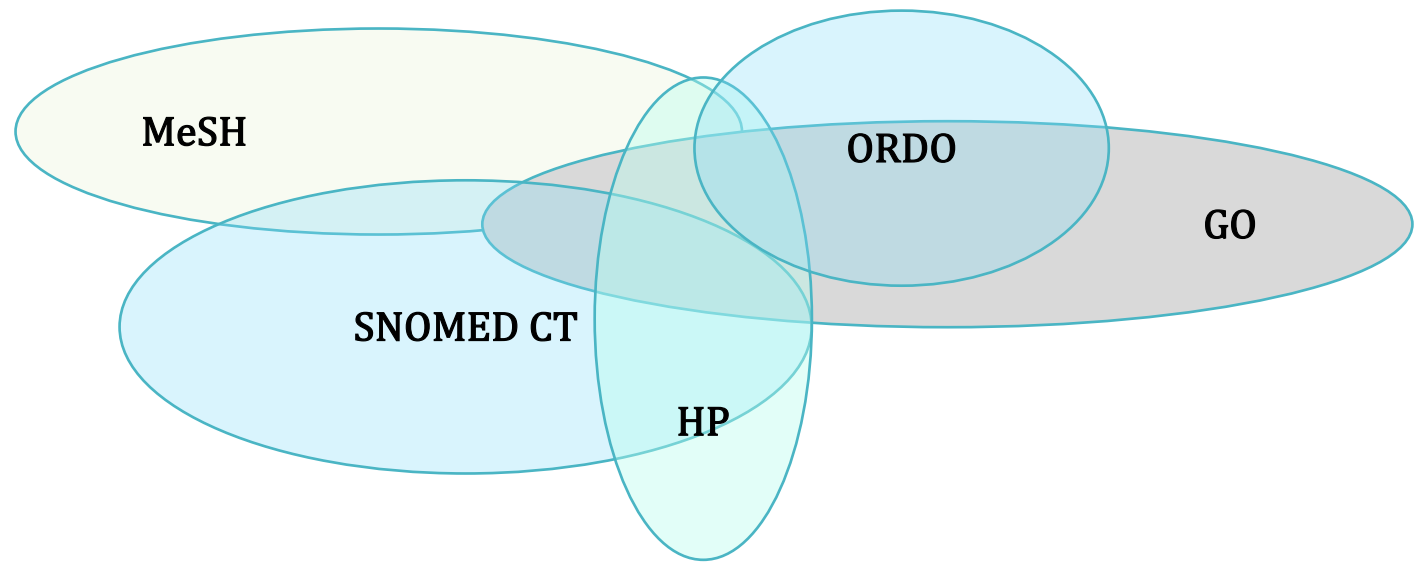
October 13, 2021

Issues with ontologies...

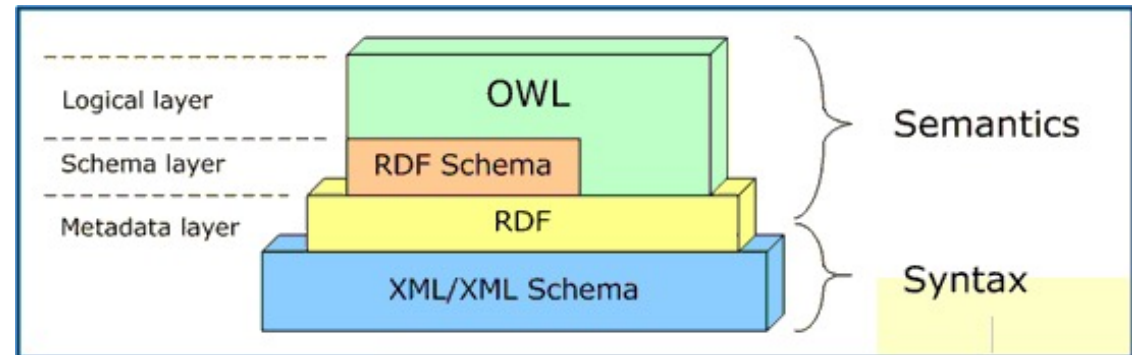
spread out, in different formats, of different size, with different structures



Number of ontologies in the NCBO BioPortal



Overlapping ontologies

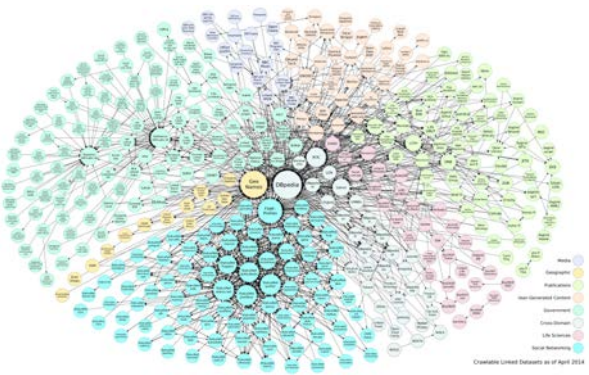


Variety of representation languages

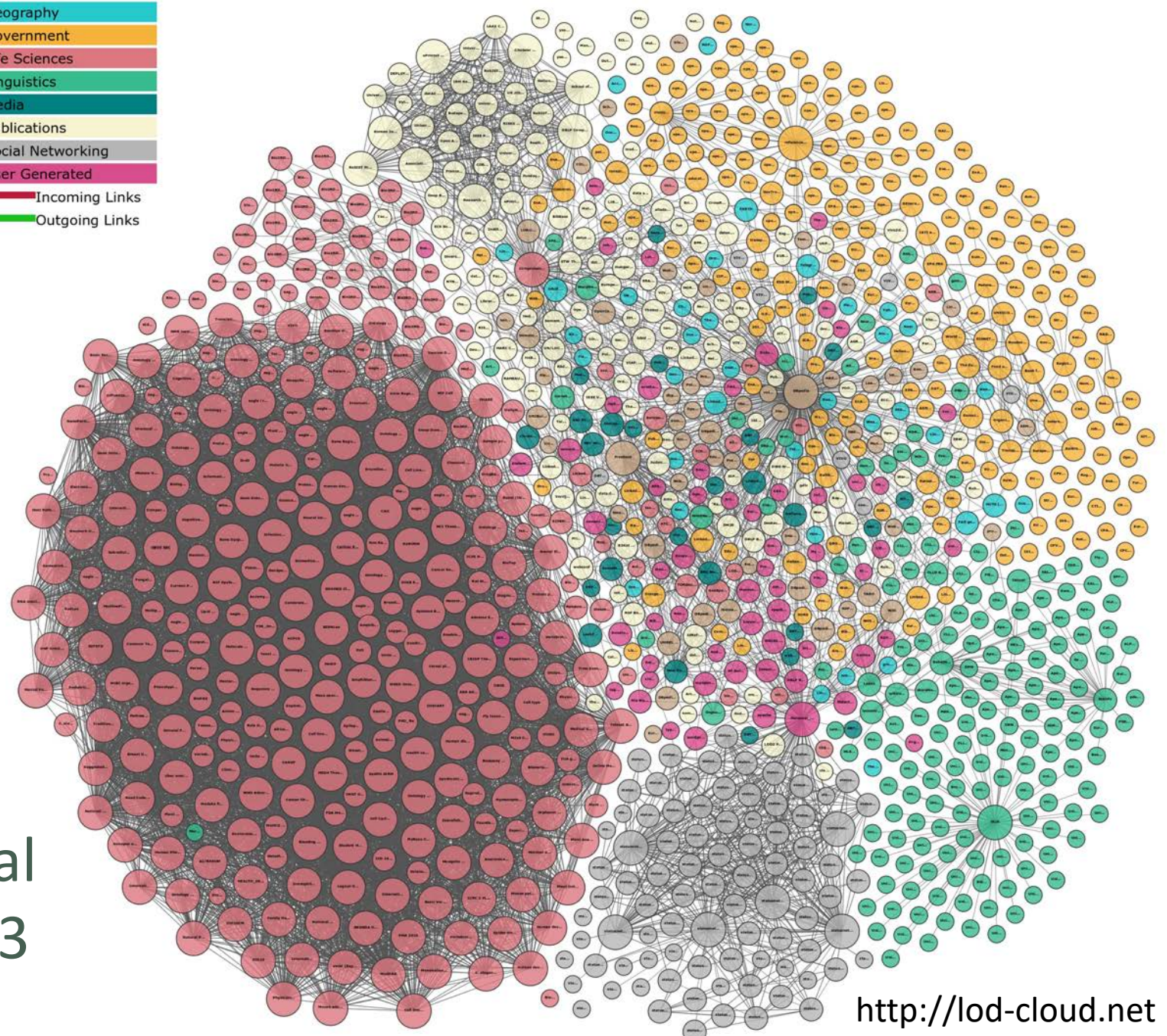
Why ontology repositories are important?

- 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 **data** 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 ?





- Legend**
- Cross Domain
 - Geography
 - Government
 - Life Sciences
 - Linguistics
 - Media
 - Publications
 - Social Networking
 - User Generated
 - Incoming Links
 - Outgoing Links



NCBO BioPortal
data as of 2013

Challenges for ontology repositories

HABILITATION A DIRIGER DES RECHERCHES (HDR)
Spécialité Informatique
École Doctorale Information, Structures, Systèmes

Université de Montpellier

**ONTOLOGY REPOSITORY AND
ONTOLOGY-BASED SERVICES**
Challenges, contributions and applications to
biomedicine & agronomy


Manuscript v4.0 – May 2019

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Jury
(defense May 28th 2019)

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Laboratory of Informatics, Robotics, and Microelectronics of Montpellier (LIRMM),
University of Montpellier & CNRS, France



Ontology metadata, evaluation and selection



Multilingualism



Ontology alignment



Generic ontology-based services
(especially for free text data)



Annotations and linked data



Scalability and interoperability

AgroPortal: a vocabulary and ontology repository for agronomy

<http://agroportal.lirmm.fr>



- Develop and support a reference ontology repository
 - **Primary focus** on the agronomy & close related domains (plant sciences, food and biodiversity)
- 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 & specificities of the agronomic community
 - Fully semantic web compliant infrastructure
 - Enable **new science**

<http://bioportal.bioontology.org>

Ontology Services →

- Search
- Traverse
- Comment
- Download

Mapping Services →

- Create
- Upload
- Download

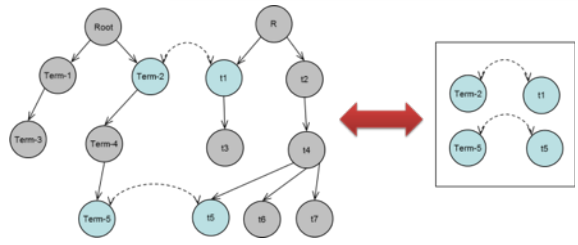
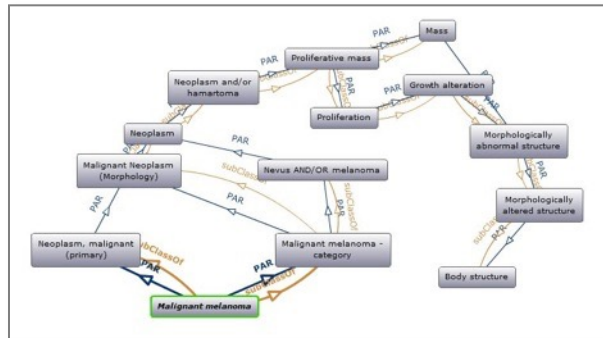
Widgets →

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

Annotation → Term recognition

Data Access → Search "data" annotated with a given term

<http://data.bioontology.org>

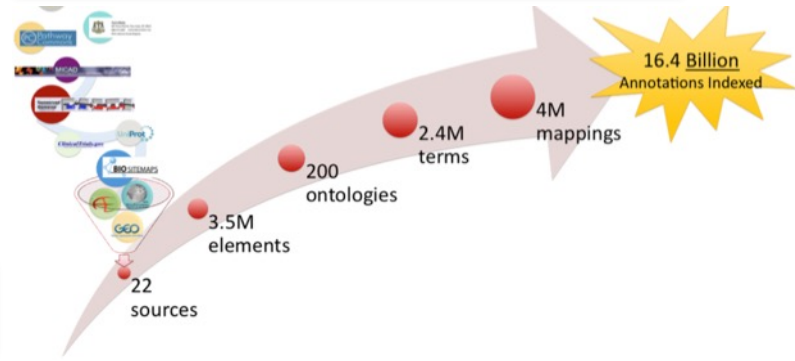


Jump To:

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



AgroPortal an ontology repository

for agronomy, food, plant sciences & biodiversity

<http://agroportal.lirmm.fr>

- ▶ Publish, search, download
- ▶ Browse, visualize
- ▶ Peer review
- ▶ Versioning
- ▶ Annotation
- ▶ Recommendation
- ▶ Mapping
- ▶ Notes
- ▶ Projects

Browse

Browse the library of ontologies

Search... Showing 131 of 137 Sort: Popular

Submit New Ontology

Entry Type

- Ontology (131)
- Ontology View (6)

Uploaded in the Last

Category

- Agricultural Resear... (24)
- Animal Science an... (11)
- Biodiversity and E... (17)
- Breeding and Gen... (1)
- Farms and Farmin... (7)
- Fisheries and Aqua... (2)
- Food Security (2)
- Food and Human ... (6)
- Forest Science ... (1)

Group

- AGBIODATA (18)
- AGROLD (6)
- CROP (37)
- INRAE (30)
- OBO-FOUNDRY (23)
- RICE (24)
- SEMANDIV (11)
- WHEAT (19)

Format

- OBO (12)
- OWL (105)
- SKOS (11)
- UMLS (2)

Ontology Content

- AnaEE Thesaurus (ANAETHES)**
The AnaEE thesaurus aims to provide a controlled vocabulary for the semantic description of the study of continental ecosystems and their biodiversity
Uploaded: 12/12/20 project: 4 classes: 3,247
- OntoBiotope (ONTOBIOTOPE)**
OntoBiotope is an ontology of microorganism habitats
Uploaded: 9/28/19 project: 6 classes: 3,602
- DEMETER Agriculture Information Model (DEMETER-AIM)**
The DEMETER Agri Profile is a master profile importing focused specific profiles/modules of DEMETER AIM.
Uploaded: 10/30/20 project: 1 classes: 173
- AGROVOC (AGROVOC)**
AGROVOC is a controlled vocabulary covering all areas of interest of the Food and Agriculture Organization (FAO) of the United Nations, including food, nutrition, agriculture, fisheries, forestry, environment etc
Uploaded: 12/30/20 project: 4 classes: 837,186
- Global Agricultural Concept Scheme (GACS)**
The Global Agricultural Concept Scheme (GACS) is a hub for concepts related to agriculture, in multiple languages, for use in Linked Data
Uploaded: 6/4/18 project: 2 classes: 584,881
- Animal Disease Ontology (ANDO)**
L'ontologie des maladies animales est un référentiel de maladies touchant des animaux de rente et d'agents pathogènes ainsi que des relations qu'ils entretiennent
Uploaded: 11/14/18 project: 2 classes: 1,858
- Agri-Food Experiment Ontology (AFEO)**
The Agri-Food Experiment Ontology (AFEO), a new ontology network was developed based on two existing ontology resources, i.e
Uploaded: 8/5/20 notes: 1 project: 2 classes: 68

Welcome to AgroPortal, a vocabulary and ontology repository for agronomy and related domains

Search for a class
Enter a class, e.g. Melanoma

Find an ontology
Start typing ontology name, then choose from list

Advanced Search

Ontology Visits (December 2020)

ANAETHES	~80
ONTOBIOTOPE	~60
DEMETER-AIM	~40
AGROVOC	~30
GACS	~20

AgroPortal Statistics

Ontologies	131
Classes	2,648,090
Individuals	2,194,309
Projects	47
Users	246

Supported by

With the collaboration of

PRODUCTS: OntoPortal, NCBO Web Widgets

SUPPORT: Contact Us, Documentation, NCBO Wiki, OntoPortal admin

ABOUT: About Us, D2KAB project

CONNECT: Twitter, GitHub, LinkedIn

AgroPortal is currently being developed within French ANR D2KAB project (ANR-18-CE23-0017). It also receives or received support from ANR SIFR project (ANR-12-JS02-0010), European Union H2020-MSCA SIFRm project (No 701771), the NUMEV Labex (ANR-10-LABX-0020), the IBC of Montpellier project (ANR-11-BINF0002), the Agro Labex (ANR-10-LABX-0001) as well as from University of Montpellier, CNRS and INRAE.

- ▶ 131 ontologies, 90 candidates
- ▶ 5 driving use cases
- ▶ ~240 registered users

2016: Five original driving agronomic use cases

- IBC Rice Genomics & AgroLD project

- Data integration and knowledge management related to rice (P. Larmande)



- RDA Wheat Data Interoperability working group

- Common framework for publishing wheat data (E. Dzalé-Yeumo)



- LovInra : INRA Linked Open Vocabularies

- Vocabularies produced by INRA scientists (S. Aubin)



- Crop Ontology project

- Ontologies for describing crop germplasm & traits (E. Arnaud)

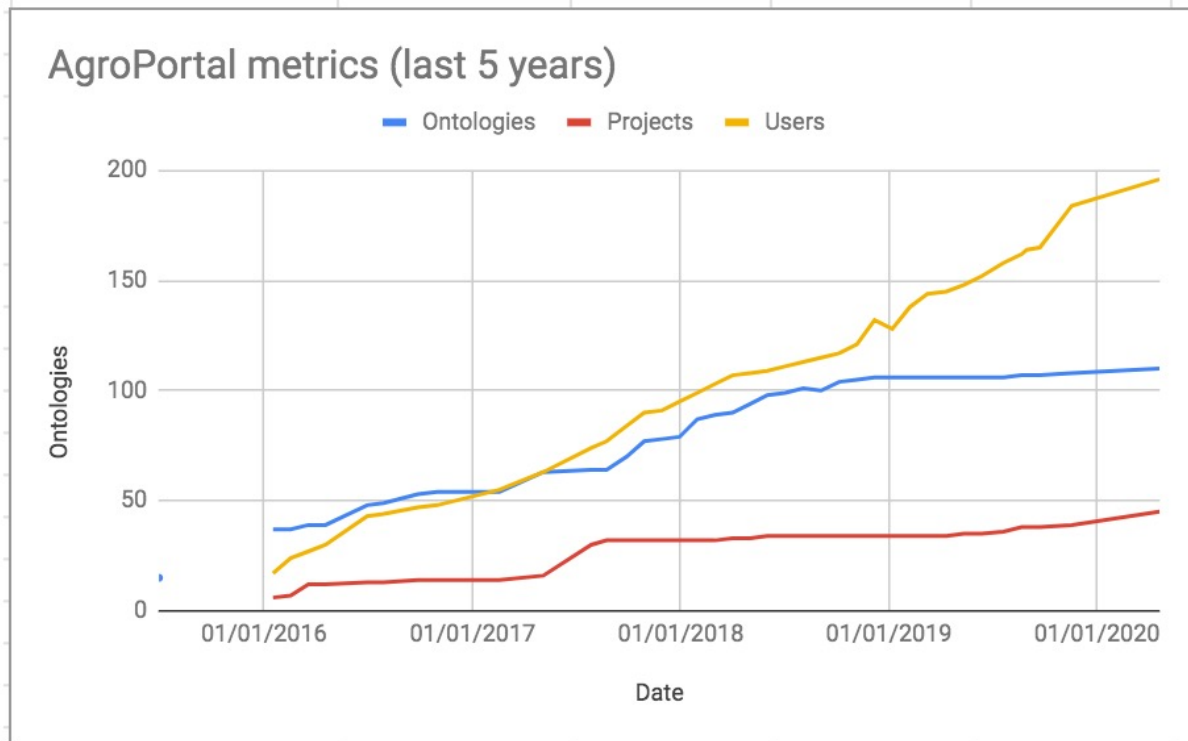


- GODAN global map of agri-food data standards

- VEST/AgroPortal MAP of standards (V. Pesce)



A growing interest in the community



- RDA Agrisemantics WG
- GO-FAIR Food System Implementation Network
- D2KAB ANR project
- Adoptions by projects e.g. PHIS, AgroLD
- SemanDiv CNRS WG
- AgroHackathons
- Maybe:
 - IC-FOODS initiative
 - ELIXIR F&N community

Examples of ontologies uploaded in AgroPortal

Title	Format	Groups	Size
IBP Rice Trait Ontology (CO_320)	OWL	CROP, RICE	~2K
IBP Wheat Trait Ontology (CO_321)	OWL	CROP, WHEAT	~1K
IBP Wheat Anatomy Ontology (CO_121)	OBO	CROP, WHEAT	~80
IBP Crop Research (CO_715)	OBO	CROP	~250
Multi-Crop Passport Ontology (CO_020)	OBO	CROP	~90
Biorefinery (BIOREFINERY)	OWL	LOVINRA	~300
Matter Transfer (TRANSMAT)	OWL	LOVINRA	~1.1K
Plant Ontology (PO)	OWL	WHEAT, RICE, OBOF	~2K
Plant Trait Ontology (TO)	OWL	WHEAT, RICE, OBOF	~4.4K
Durum Wheat (DURUM_WHEAT)	OWL	LOVINRA	~130
Agricultural Experiments (AEO)	OWL	LOVINRA	~60
Environment Ontology (ENVO)	OWL	WHEAT, OBOF	~6.3K
NCBI Organismal Classification (NCBITAXON)	RRF	WHEAT	~900K
AnaEE Thesaurus (ANAEE)	SKOS	LOVINRA	~3.3K
French Crop Usage (CROPUSAGE)	SKOS	none	~300
Agrovoc (AGROVOC)	SKOS	none	~32K
Food Ontology (FOODON)	OWL	OBOF	~10K
National Agriculture Library Thesaurus (NALT)	SKOS	none	~67K
Global Agricultural Concept Scheme (GACS)	SKOS	none	~585K

Browse and select ontologies

- Allows to search, order and select ontologies using a **faceted search** approach, based on the metadata

AgroPortal Browse Search Mappings Recommender Annotator Projects Landscape Login Support

Browse

Browse the library of ontologies ?

Search... Showing 136 of 140 Sort: Popular

Submit New Ontology

Entry Type

- Ontology (136)
- Ontology View (4)

Uploaded in the Last

Category

- Agricultural Resear... (27)
- Animal Science an... (11)
- Biodiversity and Ec... (17)
- Breeding and Gene... (1)
- Farms and Farming... (8)
- Fisheries and Aqua... (2)
- Food Security (2)
- Food and Human ... (10)

Group

- AGBIODATA (18)
- AGROLD (5)
- CROP (37)
- INRAE (30)
- OBO-FOUNDRY (23)
- RICE (24)
- SEMANDIV (11)
- WHEAT (19)

AnaEE Thesaurus (ANAEETHES)

The AnaEE thesaurus aims to provide a controlled vocabulary for the semantic description of the study of continental ecosystems and their biodiversity

Uploaded: 12/12/20

4 projects 3,247 concepts

AGROVOC (AGROVOC)

Since the early 1980's, the Food and Agriculture Organization of the United Nations (FAO) has coordinated AGROVOC, a valuable tool for data to be classified homogeneously, facilitating interoperability and reuse

Uploaded: 7/5/21

4 projects 893,416 concepts

French Crop Usage (Classification des plantes cultivées en France en fonction des usages) (CROPUSAGE)

Les sources utilisées sont le registre parcellaire, le larousse agricole, wikipédia, le catalogue officiel des espèces et variétés de plantes cultivées en France du GEVES, les fiches "les plantes fourragères pour les prairies" du GNIS, la base Ephy, la liste des cultures à utiliser pour renseigner le descriptif des parcelles et les statistiques agricoles annuelle de l'Agreste

Uploaded: 8/17/21

2 notes 2 projects 533 concepts

Agriculture and Forestry Ontology (AFO)

The Agriculture and Forestry Ontology (AFO) is based on the Agriforest thesaurus maintained by the Viikki Campus Library, University of Helsinki

Uploaded: 12/27/18

31,991 concepts

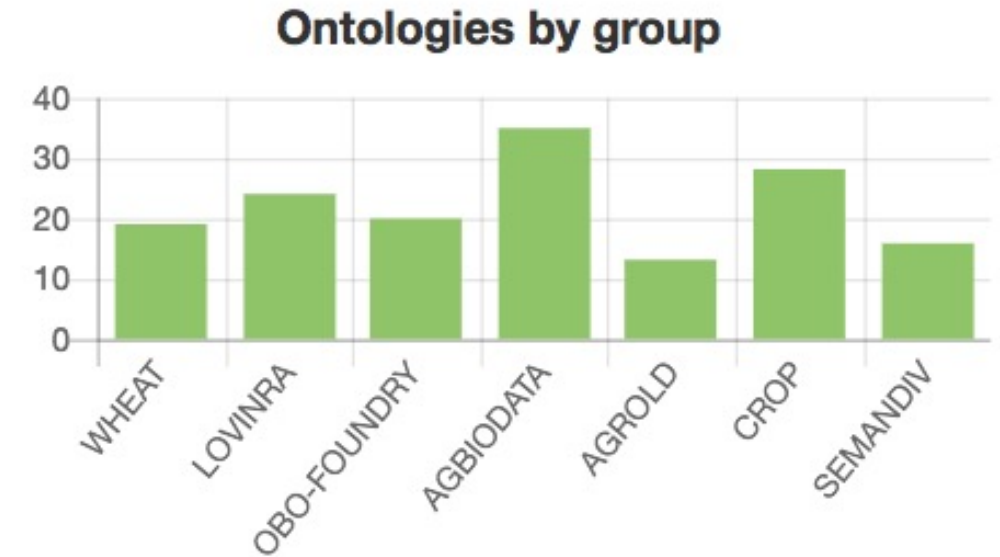
Agronomy Ontology (AGRO)

AgrO, the Agronomy Ontology, describes agronomic practices, techniques, and variables used in agronomic experiments

4 projects 3,500 classes

Ontology groups and categories

Category	Number
Plant Phenotypes and Traits	31
Plant Anatomy and Development	4
Natural Resources, Earth and Environment	12
Animal Science and Animal Products	6
Agricultural Research, Technology and Engineering	15
Breeding and Genetic Improvement	1
Plant Science and Plant Products	7
Plant Genetic Resources	2
Food and Human Nutrition	7
Food Security	2
Taxonomic Classifications of Organisms	6
Farms and Farming Systems	5
Fisheries and Aquaculture	2
Forest Science and Forest Products	2
Biodiversity and Ecology	14



Specific slices display to use only the ontologies of a group

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

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



Class Search

soil profile

Enter a class, e.g. Melanoma

[Show advanced options](#)

Search

Matches in 3 ontologies

soil profile - AnaEE Thesaurus (ANAEETHES)

http://opendata.inra.fr/anaeeThes/c_1436972580233

A vertical section of a soil, showing horizons and par

[details](#) - [visualize](#)

soil profile - GEneral Multilingual Environmental

<http://www.eionet.europa.eu/gemet/concept/7882>

A vertical section of a soil, showing horizons and par

[details](#) - [visualize](#)

Soil Profile - agINFRA Soil Vocabulary (SOIL)

<http://vocabularies.aginfra.eu/soil#SoilProfile>

The core class for soil description. Definition: descri

The soil profile is abstracted from observations ...

[details](#) - [visualize](#)

Tree Widget

Display a class tree with a search field for ANAEETHES

Get code

leaf |

leaf carbohydrate content

leaf area index

leaf growth

leaf litter

leaf nitrogen content

leaf area index of senescent leaf

leaf wetting duration

leaf water potential

leaf cumulative loss by pest

leaf area per plant

leaf area

leaf phosphorus content

leaf temperature

senescent leaf

PRODUCTS

OntoPortal

NCBO Web Widgets



SUPPORT

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Documentation

NCBO Wiki

OntoPortal admin

D2KAB project



AnaEE Thesaurus

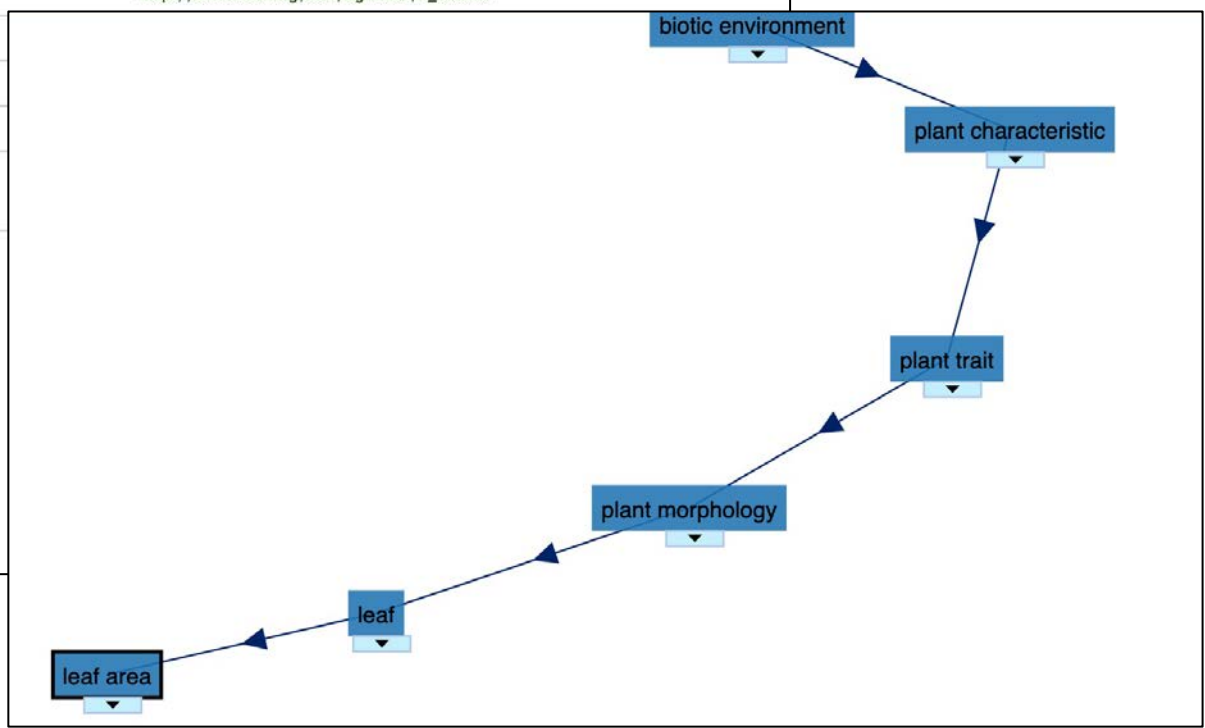
Last uploaded: December 12, 2020

- Summary
- Classes**
- Properties
- Notes
- Mappings
- Widgets

Jump to:

- abiotic environment
- biotic environment
 - anatomy
 - animal characteristic
 - biodiversity
 - biomass
 - living organism (classification)
 - microorganism characteristic
 - phenology
 - plant characteristic
 - plant community
 - plant population
 - plant trait
 - crop age
 - ecophysiological trait
 - plant age
 - plant biomass
 - plant carbon content
 - plant development stage
 - plant dispersal
 - plant growth
 - plant morphology
 - bark
 - dendrometry
 - leaf
 - fallen leaf
 - foliar index
 - green leaf
 - leaf area**
 - leaf area index
 - leaf area per plant
 - leaf carbohydrate content

Details	Visualization	Notes (0)	Class Mappings (15)	Access Class JSON
Preferred Name	leaf area			
ID	http://opendata.inra.fr/anaeeThes/c4_2876			
broader	leaf			
created	2016-12-09T11:50:00Z			
exactMatch	http://aims.fao.org/aos/agrovoc/c_16110			
hasStatus				
inScheme				
modified				
prefLabel				



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?

More Permissions <https://www.etalab.gouv.fr/wp-content/uploads/2018/11/open-licence.pdf>

Natural Language 

Ontology Related To [ATOL](#), [EOL](#)

Publisher INRA (<http://www.inra.fr/>)

Projects using AHOL

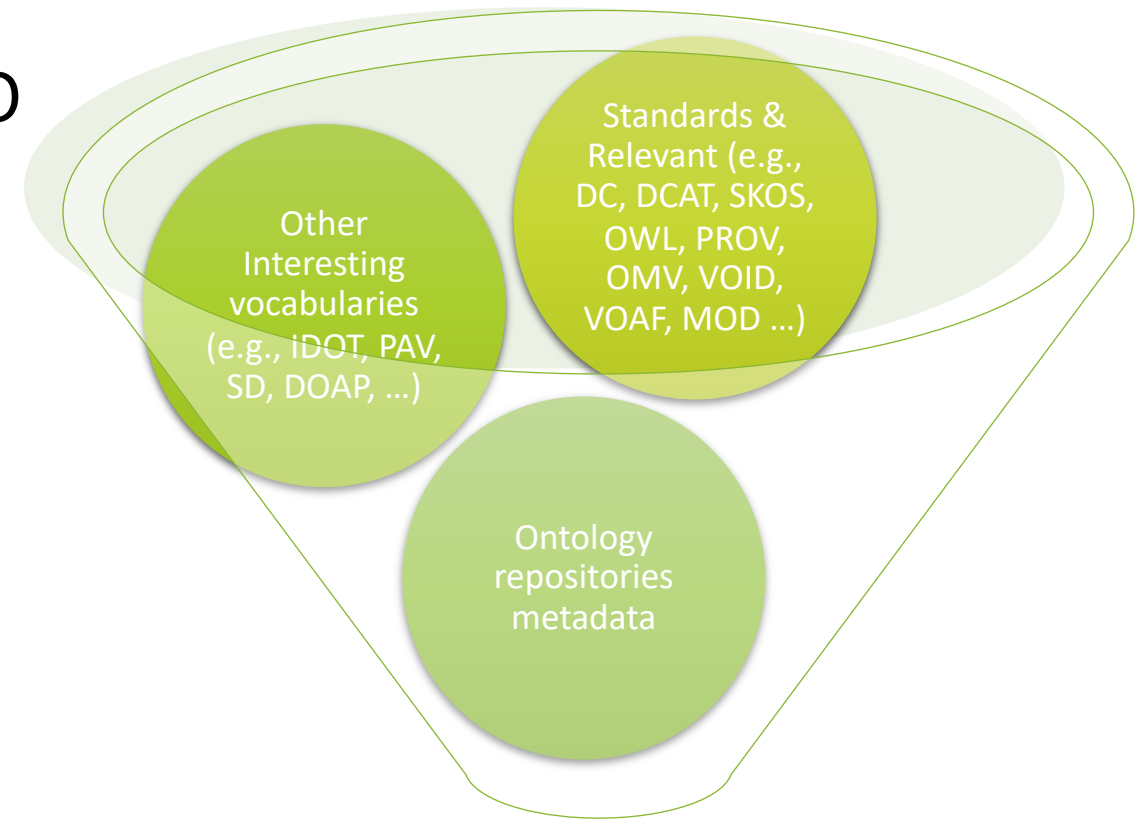
[Agrisemantics Map of Data Standards](#)

[Sicpa Sanitaire Web](#)

[Vocabulaires Ouverts @INRAE](#)

Building a list of properties to describe ontologies

- Pickup properties and relations from 23 existing vocabularies
- Existing properties in ontology repositories (especially BioPortal)
 - Non specific properties that may “return to the ontology”
- Map them all together
 - Strong overlap e.g., 25 properties to describe dates



346 relevant properties that could be used to describe ontologies

127 used to build a new metadata model

MOD 1.4 (August, 2018)

(<https://www.isibang.ac.in/ns/mod/index.html>)

Stable

MOD: Metadata for Ontology Description and publication

Release August 2, 2018

This version:

<http://www.isibang.ac.in/ns/mod/1.4>

Latest version:

<http://www.isibang.ac.in/ns/mod/1.4>

Previous version:

<http://www.isibang.ac.in/ns/mod/1.2>

<https://www.isibang.ac.in/ns/mod/1.1>

<https://www.isibang.ac.in/ns/mod/1.0>

Revision:

1.4

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Udaya Varadarajan, ([Indian Statistical Institute](#))

Publisher:

<http://www.isibang.ac.in/>

Download serialization:

Format [JSON LD](#) Format [RDF/XML](#) Format [N Triples](#) Format [TTL](#)

License:

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Cite as:

Dutta, B., Toulet, A., Emonet, V. and Jonquet, C. (2017). New Generation Metadata vocabulary Description and Publication. In E. Garoufallou, S. Virkus, R. Siatri and D. Koutso Communications in Computer and Information Science (CCIS) 755, proceedings of 11th M Semantics Research Conference (MTSR 2017), November 28 - December 1, 2017, Talli Springer Nature, pp. 173-185.



Classes: 24
Object property: 44
Data property: 96

Describe ontologies with semantic metadata

- Display “per ontology”
 - Ontology specific properties => viewable and editable within the ontology specific page
- Everything you need to know about an ontology
- URIs used in the backend to store the information
 - e.g., CC-BY => <https://creativecommons.org/licenses/by-nd/4.0/>
- “Get my metadata back” buttons

The screenshot displays the OntoBiotope ontology page. The 'Details' section includes information such as visibility (Public), description, status (Production), format (OBO), contact (Claire Nédellec), and homepage. The 'Additional Metadata' section, highlighted with a red box, provides details on natural language (English), version (1.2), release date (2015-06-29T00:00:00), keywords (information extraction, corpus annotation, natural language processing, ontology building, biology, genetics), known usage (used by the BioNLP Shared task), notes, creators (Claire Nédellec), designed for ontology task (http://omv.ontoware.org/2005/05/ontology#AnnotationTask), endorsed by (INRA), funded by (INRA), has formality level (http://3id.org/3id:skos:skos:ontology), has license (CC BY), ontology syntax (http://purl.org/ontology/obo/owl/obofrmatspec.html), is of type (http://omv.ontoware.org/2005/05/ontology#DomainOntology), publisher (INRA), identifier (doi.org/10.15454/1.4382640528105164E12), and copyright holder (INRA). The 'Metrics' section shows statistics like 2320 classes, 0 individuals, 0 properties, 13 maximum depth, 42 maximum number of children, 3 average number of children, 240 classes with a single child, 3 classes with more than 25 children, and 2320 classes with no definition. The 'Visits' section features a line graph showing visit trends from February 2016 to May 2017. The 'Reviews' section indicates no reviews are available. The 'Submissions' section lists two submissions: version 1.2 (Released: 06/29/2015, Uploaded: 06/12/2016) and BioNLP-ST 2013 version (Released: 06/29/2015, Uploaded: 06/29/2015). The 'Projects Using This Ontology' section lists three projects: LOVbra (linked Open Vocabularies) by Sophie Aubin at INRA, OntoBiotope by Claire Nédellec at INRA, and VEST-AgroPortal Map of Standards by Valeria Pesce at Food & Agriculture Organization. A red box highlights the 'Get my metadata back' buttons (N-Triples, JSON-LD, RDF/XML) and the 'Additional Metadata' section.

AgroPortal landscape page

- Display “per property”
 - Global presentation of the properties
 - Synthesis diagrams & listing
- Allows to explore the **agronomical ontology landscape** by automatically aggregating the metadata fields of each ontologies in explicit visualizations (charts, term cloud and graphs).



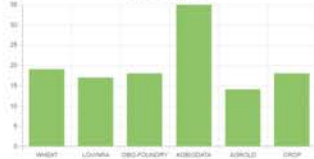
Clement Jonquet, Anne Toulet, Biswanath Dutta, Vincent Emonet. Harnessing the power of unified metadata in an ontology repository: the case of AgroPortal. *Journal on Data Semantics*, Springer, 2018, pp.1-31.

AgroPortal Landscape

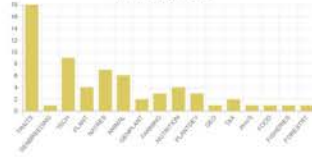
Visualize data retrieved from the ontologies stored in the portal

Groups and categories

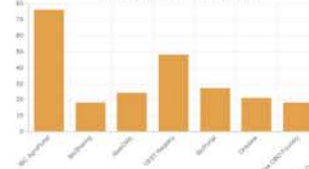
Ontologies by group



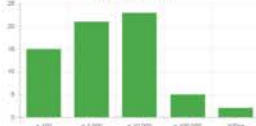
Ontologies by category



Ontologies count in each data catalog



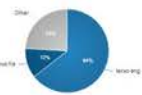
Ontologies by size



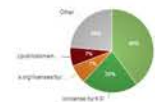
Properties use

The proportion of properties usage among stored ontologies

Ontologies natural languages



Licenses used by the ontologies

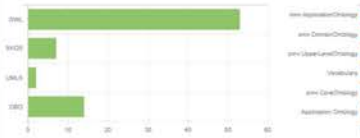


Most used tools to build ontologies

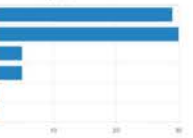


Ontologies types

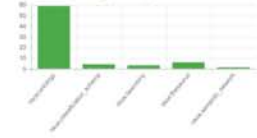
Format used



Ontology types



Ontology formality levels



Contributors to ontologies development

Most active people

Most mentioned people as contact, creator, contributor, curator

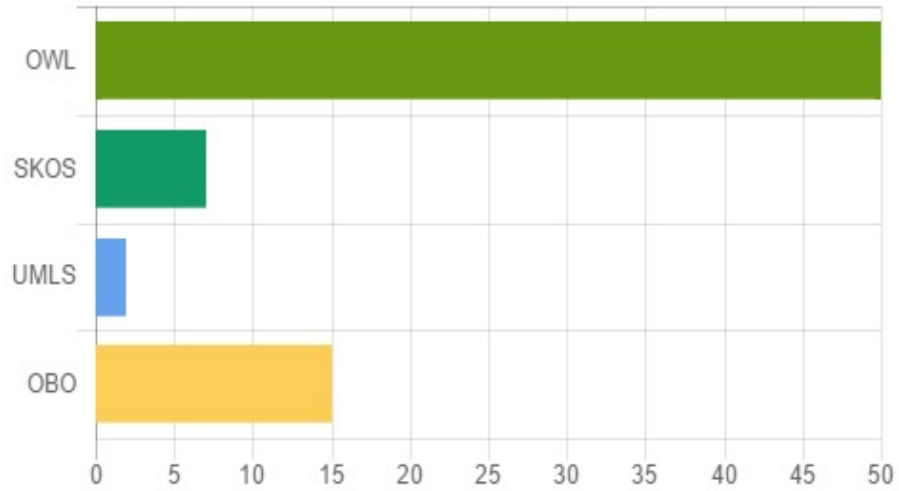


Most active organizations

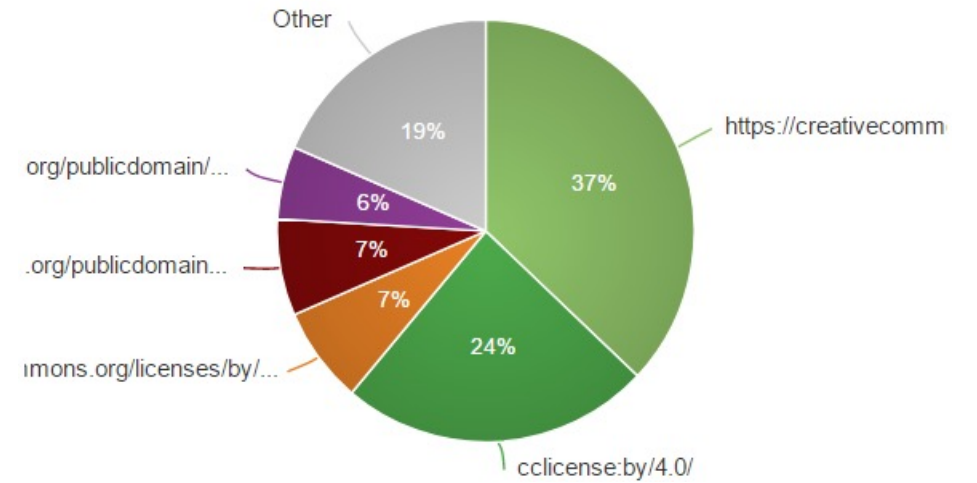
Organizations that fund and endorse the greatest number of ontologies



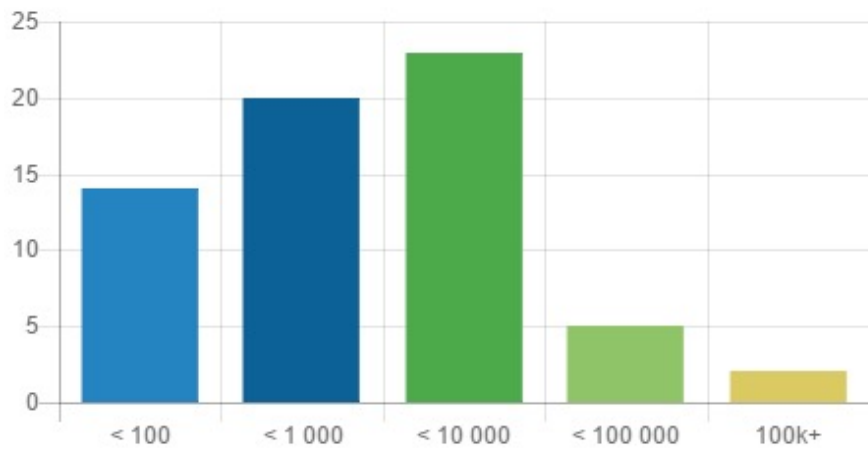
Format



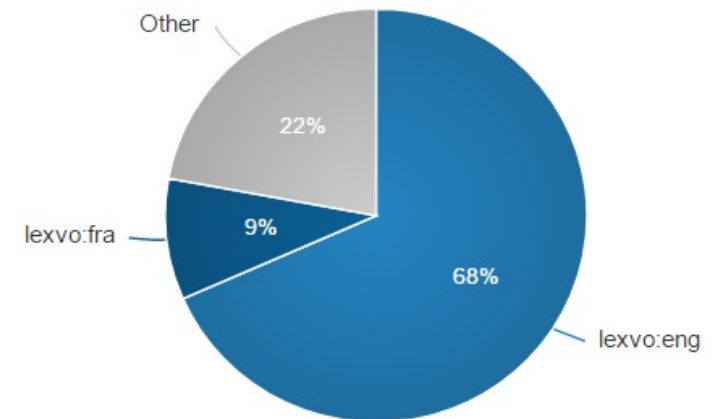
License



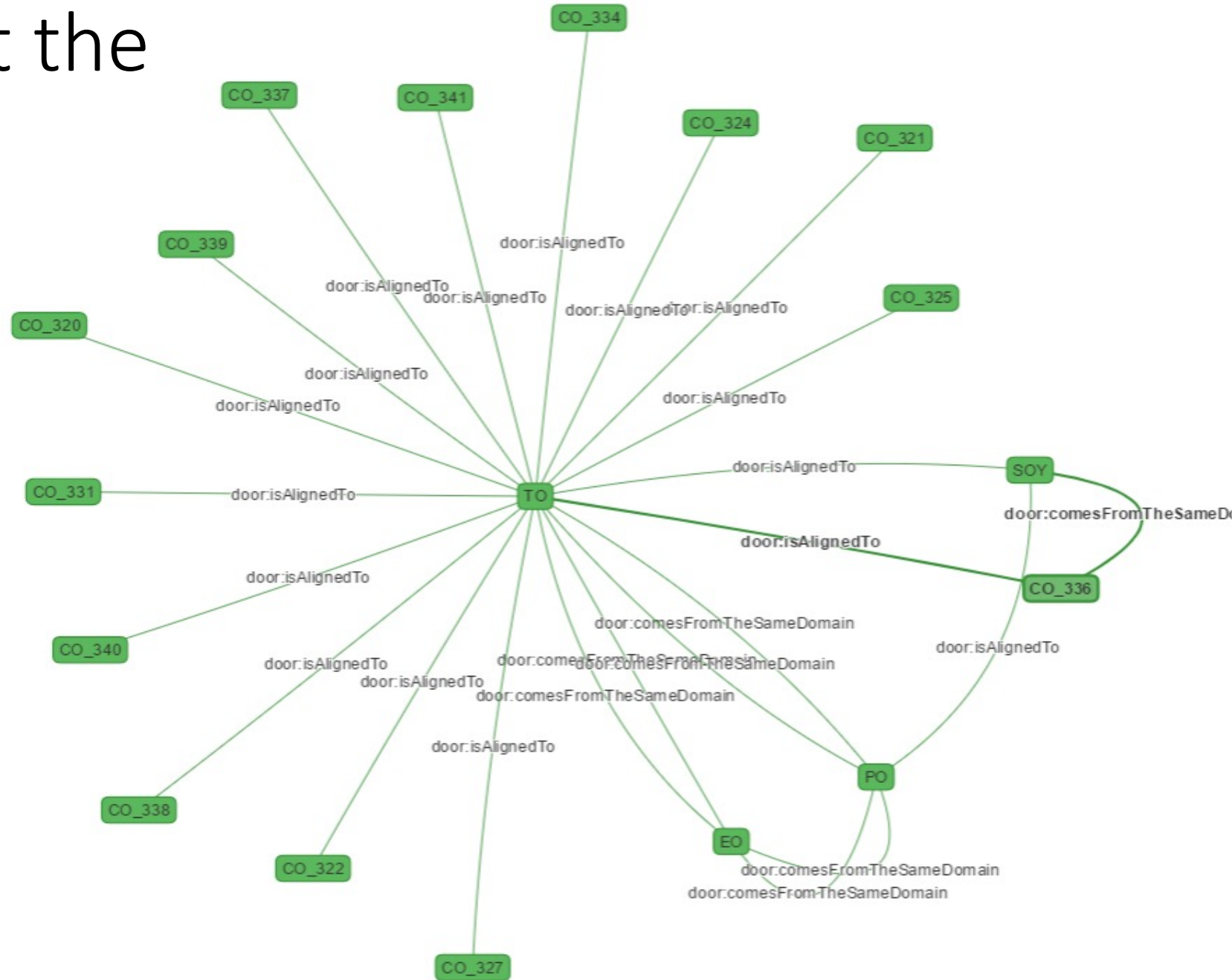
Size



Language



Information about the ontology network



O

- omv:useImports
- door:isAlignedTo
- door:ontologyRelatedTo
- omv:isBackwardCompatibleWith
- omv:isIncompatibleWith
- door:comesFromTheSameDomain
- door:similarTo
- door:explanationEvolution
- voaf:generalizes
- door:hasDisparateModelling
- dct:hasPart
- voaf:usedBy
- schema:workTranslation
- schema:translationOfWork

Filter Network



Our objective now: automatic FAIRness assessment of an ontology

1. within AgroPortal
2. outside of AgroPortal

- Enhance the level FAIRness of ontologies.
- Help users respect the I2 FAIR principle.
- Help users in identifying FAIR ontologies.
- Provide useful analysis of the semantic agronomic landscape.



Details

ACRONYM	ONTOBIOTOPE
VISIBILITY	Public
DESCRIPTION	OntoBiotope is an ontology of microorganism habitats. Its modeling principle and its lexicon reflect the biotope classification used by biologists to describe microorganism isolation sites (e.g. GenBank, GOLD, ATCC). OntoBiotope is developed and maintained by the Meta-omics of Microbial Ecosystems (MEM) network in which 30 microbiologists from INRA (French National Institute for Agricultural Research) from all fields of applied microbiology participate. The relevance of OntoBiotope terms is evaluated through the PubMedBiotope semantic search engine. It identifies and categorizes microbial biotopes in all PubMed abstracts by applying the ToMap method (Text to Ontology Mapping) to the OntoBiotope ontology. It also indexes 3.35 millions relations between taxa and their habitats.
STATUS	Production
FORMAT	OBO
CONTACT	Claire Nédellec, claire.nedellec@ovp.inra.fr
HOME PAGE	http://ovp.inra.fr/
PUBLICATIONS PAGE	https://doi.org/10.1186/1471-2105-16-S10-S1
DOCUMENTATION PAGE	http://ovp.inra.fr/
CATEGORIES	Natural Resources, Earth and Environment
GROUPS	INRA Linked Open Vocabularies

Additional Metadata

NATURAL LANGUAGE	
VERSION	1.2
RELEASE DATE	2015-06-29T00:00:00+00:00
KEYWORDS	information extraction, corpus annotation, natural language processing, ontology building, biology, genetics
KNOWN USAGE	Used by the BioNLP Shared task (Bacteria Biotope task) in 2011, 2013 and 2016
NOTES	OntoBiotope is developed and maintained by the Meta-omics of Microbial Ecosystems (MEM) network in which 30 microbiologists from INRA (French National Institute for Agricultural Research) from all fields of applied microbiology participate.
CREATORS	Claire Nédellec
DESIGNED FOR ONTOLOGY TASK	http://www.ontoware.org/2005/05/ontology#AnnotationTask
ADDRESS BY	INRA (http://www.inra.fr/)
FOUNDED BY	INRA (http://www.inra.fr/)
HAS FORMALITY LEVEL	http://the3rd.org/has/has/ontology#ontology
HAS LICENSE	
ONTOLOGY SYNTAX	http://purl.obolibrary.org/obo/oboformat#spec.html
IS OF TYPE	http://www.ontoware.org/2005/05/ontology#DomainOntology
PUBLISHER	INRA (http://www.inra.fr/)
IDENTIFIER	doi.org/10.15454/1.4382640528105164E12
COPYRIGHT HOLDER	INRA (http://www.inra.fr/)

Metrics

NUMBER OF CLASSES	2320
NUMBER OF INDIVIDUALS	0
NUMBER OF PROPERTIES	0
RADIUS DEPTH	13
RADIUS NUMBER OF CHILDREN	42
AVERAGE NUMBER OF CHILDREN	3
CLASSES WITH A SINGLE CHILD	248
CLASSES WITH MORE THAN 25 CHILDREN	3
CLASSES WITH NO DEFINITION	2320

Visits Download as CSV

Submissions

Project	Description	People	Institution
LOVira - Linked Open Vocabularies	LOVira est un service proposé par le Délégation à...	Sophie Aubin (sophie.aubin@versailles.inra.fr)	INRA
OntoBiotope	L'ambition pour OntoBiotope est de normaliser la description.	Claire Nédellec (claire.nedellec@ovp.inra.fr)	INRA
VEST-AgroPortal Map of Standards	This VEST-AgroPortal provides a global map of existing	Valeria Pesce (valeria.pesce@eao.org)	Food & Agriculture Organization

Ontology FAIRness assessment (to be released end 2021!!)

Average FAIR Score ? 242.16 (50%)

FAIRness assessment questions

F1

F1Q1

F1Q2

F1Q3

F1Q4

F2

F2Q1

F2Q2

F2Q3

F2Q4

F1: Ontologies and ontology metadata are assigned a globally unique and persistent identifier.

78% (32.0)

22.0% (9.0)

F1Q1 : Does an ontology have a "local" identifier i.e., a globally unique and potentially persistent identifier assigned by the developer (or developing organization)?

9.0 / 9.0

[See possible credits](#)

[See metadata used properties](#)

F1Q2 : Does an ontology provide an additional "external" identifier i.e., a guarantee globally unique and persistent identifier assigned by an accredited body?

11.0 / 11.0

[See possible credits](#)

[See metadata used properties](#)

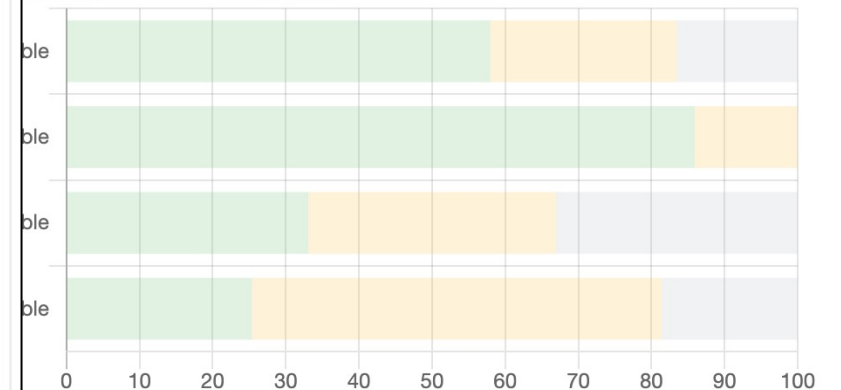
F1Q3 : Are the ontology metadata included in the ontology file- and consequently share the same identifiers or is the metadata record clearly identified by its own URI.

12.0 / 12.0

The repository makes explicit relation between metadata and ontology.

[clear selection](#) [select from list](#)

Obtained score Not obtained score N/A score



Annotator

The IBC AgroPortal Annotator processes text submitted by users, recognizes relevant ontology terms in the text and returns the annotations to the user. Use the interface below to submit sample text to get ontology-based annotations. Hover the mouse pointer on any button to see what it does. Click on the (?) to see a detailed help panel.

Subscribe to the [NCBO Annotator Users Google group](#) to learn more about who and how the Annotator is being used in different projects.

Plant height is a whole plant morphology trait which is the height of a whole plant. Plant height is sometime measured as height from ground level to the top of canopy at harvest.

insert sample text

Ontology filters

Select Ontologies

PO x
TO x

clear selection select from list

Select UMLS Semantic Types (?)

Type here to select UMLS semantic types

Select UMLS Semantic Groups (?)

Type here to select UMLS semantic groups

Matching parameters

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

NegEx / ConText

- Detect negation (?)
- Detect temporality (?)

Include Ancestors Up To Level: None Include Score: cvalue

Get Annotations



Annotations total results 7 (direct 7 / ancestor 0 / mapping 0)

CLASS filter	ONTOLOGY filter	TYPE filter	CONTEXT	MATCHED CLASS filter	MATCHED ONTOLOGY filter	SCORE ▼
whole plant	Plant Trait Ontology	direct	... of a whole plant . Plant height is ...	whole plant	Plant Trait Ontology	10.000
plant height	Plant Trait Ontology	direct	Plant height is a whole ...	plant height	Plant Trait Ontology	8.644
plant height	Plant Trait Ontology	direct	... whole plant. Plant height is sometime measured ...	plant height	Plant Trait Ontology	8.644
whole plant morphology trait	Plant Trait Ontology	direct	... is a whole plant morphology trait which is the ...	whole plant morphology trait	Plant Trait Ontology	6.644
whole plant	Plant Ontology	direct	... of a whole plant . Plant height is ...	whole plant	Plant Ontology	6.644
height	Plant Trait Ontology	direct	... is the height of a whole ...	height	Plant Trait Ontology	4.322
height	Plant Trait Ontology	direct	... measured as height from ground level ...	height	Plant Trait Ontology	4.322

Format Results As: JSON

AgroPortal Annotator

identifies ontology concepts within plain text for semantic indexing

Sprouting
 Initial Vigor
 Color of unexpanded apical root leaves
 Color of first fully expanded leaf
 Leaf vein color
 Apical Pubescence
 Length of stipules
 Number of leaf lobes
 Leaf lobe position
 Angle of petiole insertion
 Petiole length
 Petiole color
 Anthocyanin pigmentation
 Growth habit of young stem
 Pubescence of young stem
 Stem color
 Leaf scar prominence
 Apical branching
 Branching levels
 Branching Angle
 Height of first apical branch
 Height of plant
 Total fresh weight foliage and stems
 Total fresh weight foliage and stems
 Number harvested

Root number
 Fresh weight of storage
 Fresh root yield
 Dry yield
 Harvest index
 Proportion of lodged plants
 Leaf retention
 Plant architecture
 Flowers (50%)
 Sepal Color
 Disc Color
 Sigma color
 Ovary color
 Anther color
 Female stamenoids
 Male Sterile
 Days to Flower
 Fruit set
 Fruit Exocarp
 Ploidy
 Seed oclor



Annotator

The IBC AgroPortal Annotator processes text submitted by user on any button to see what it does. Click on the (?) to see a detail

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

- Plant architecture
- Flowers (50%)
- Sepal Color
- Disc Color



Cassava Trait Ontology

Ontology filters

Select Ontologies

[clear selection](#) [select from list](#)



```

- {
  - annotatedClass: {
    @id: "http://www.cropontology.org/rdf/CO_334:0000386",
    @type: "http://www.w3.org/2002/07/owl#Class"
  },
  hierarchy: [ ],
  - annotations: [
    - {
      from: 11,
      to: 23,
      matchType: "PREF",
      text: "INITIAL VIGOR"
    }
  ]
}
  
```



Cassava Trait Ontology

Summary Classes Properties Notes Mappings Widgets

Jump To:

- [-] Cassava trait
 - [-] Agronomical trait
 - [-] Anthocyanin Pigmentation
 - [-] Ease of Harvest
 - [-] Female Stamenoids
 - [-] Fresh Shoot Weight
 - [-] Fruit Exocarp Texture
 - [-] Fruit set presence
 - [-] **Initial Vigor**
 - [-] Leaf weight
 - [-] Male Sterile
 - [-] Marketable root number

Preferred Name	Initial Vigor
Synonyms	Initial plant vigor
Definitions	Initial plant vigor at one month after planting

Ontology Recommender

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

Input

Text Keywords (separated by commas)

Output

Ontologies Ontology sets

[insert sample input](#)

Some useful technical specifications for timber purchase. For example, the following criteria can be used in the technical specifications of a contract that is sustainable in environmental terms:

- the assurance that the rate of harvesting of timber does not exceed levels that can be permanently sustained;
- use of environment-friendly non-chemical methods of pest control, and the avoidance of use of chemical pesticides.

[advanced options](#)

[Get Recommendations](#)

AgroPortal Recommender

get the most relevant ontologies for your data

Ontology Recommender

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

Input

Text Keywords (separated by commas)

Output

Ontologies Ontology sets

[insert sample input](#)

Some useful technical specifications for timber purchase. For example, the following criteria can be used in the technical specifications of a contract that is sustainable in environmental terms: - the assurance that the **rate** of harvesting of timber does not exceed levels that can be permanently sustained; - use of environment-friendly non-chemical methods of **pest** control, and the avoidance of use of chemical **pesticides**.

[advanced options](#)

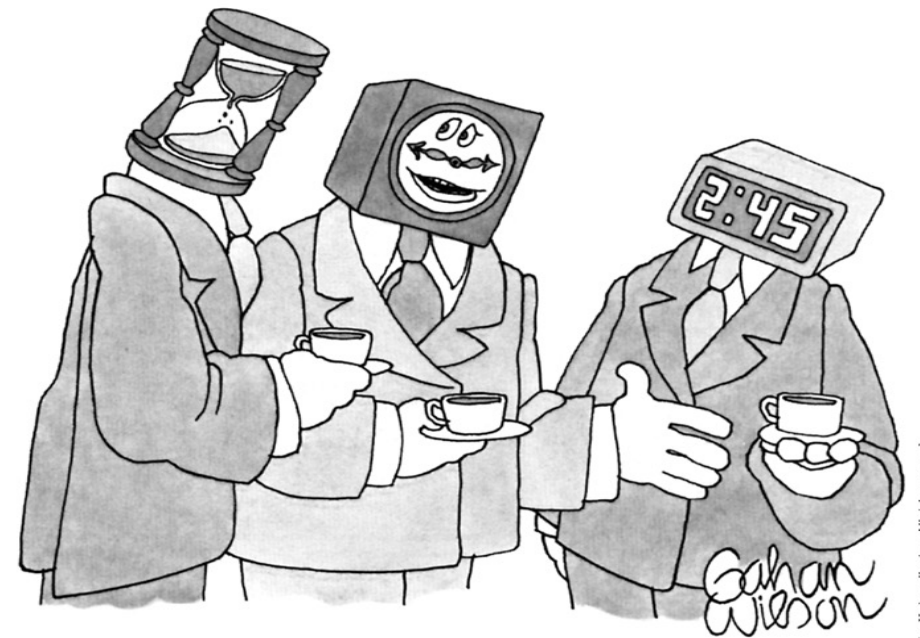
[Edit Input](#)

Recommended ontologies

POS.	ONTOLOGY	FINAL SCORE	COVERAGE SCORE	ACCEPTANCE SCORE	DETAIL SCORE	SPECIALIZATION SCORE	ANNOTATIONS	HIGHLIGHT ANNOTATIONS	
1	ANAEETHES	29.5	26.3	0.0	0.0	100.0	3		<input checked="" type="checkbox"/>
2	WHEATPHENOTYPE	22.8	31.6	0.0	13.7	22.6	3		<input type="checkbox"/>
3	TO	17.2	15.8	0.0	45.1	11.9	2		<input type="checkbox"/>
4	EFO	16.4	21.1	0.0	20.6	9.0	2		<input type="checkbox"/>
5	ENVO	15.8	15.8	0.0	35.9	10.4	2		<input type="checkbox"/>
6	STY	15.2	21.1	0.0	7.8	18.3	2		<input type="checkbox"/>
7	NCBITAXON	13.7	21.1	0.0	7.8	6.5	2		<input type="checkbox"/>
8	SIO	8.8	10.5	0.0	13.7	6.8	1		<input type="checkbox"/>
9	PATO	8.4	10.5	0.0	7.8	9.5	1		<input type="checkbox"/>
10	AEO	7.9	10.5	0.0	5.9	8.3	1		<input type="checkbox"/>
11	AFEO	7.7	10.5	0.0	5.9	6.6	1		<input type="checkbox"/>
12	PCO	7.7	10.5	0.0	7.8	5.3	1		<input type="checkbox"/>

Ontology alignment

- Ontologies, vocabularies, and terminologies inevitably **overlap** in coverage
- Mappings do not always belong to an ontology
 - The community needs a place to **store and retrieve** them
 - That's the role of the ontology repository
- Dealing with mappings is a technical, data and scientific challenge
 - Capture the **whole mapping lifecycle**
 - Semantically described with plenty of **provenance information**

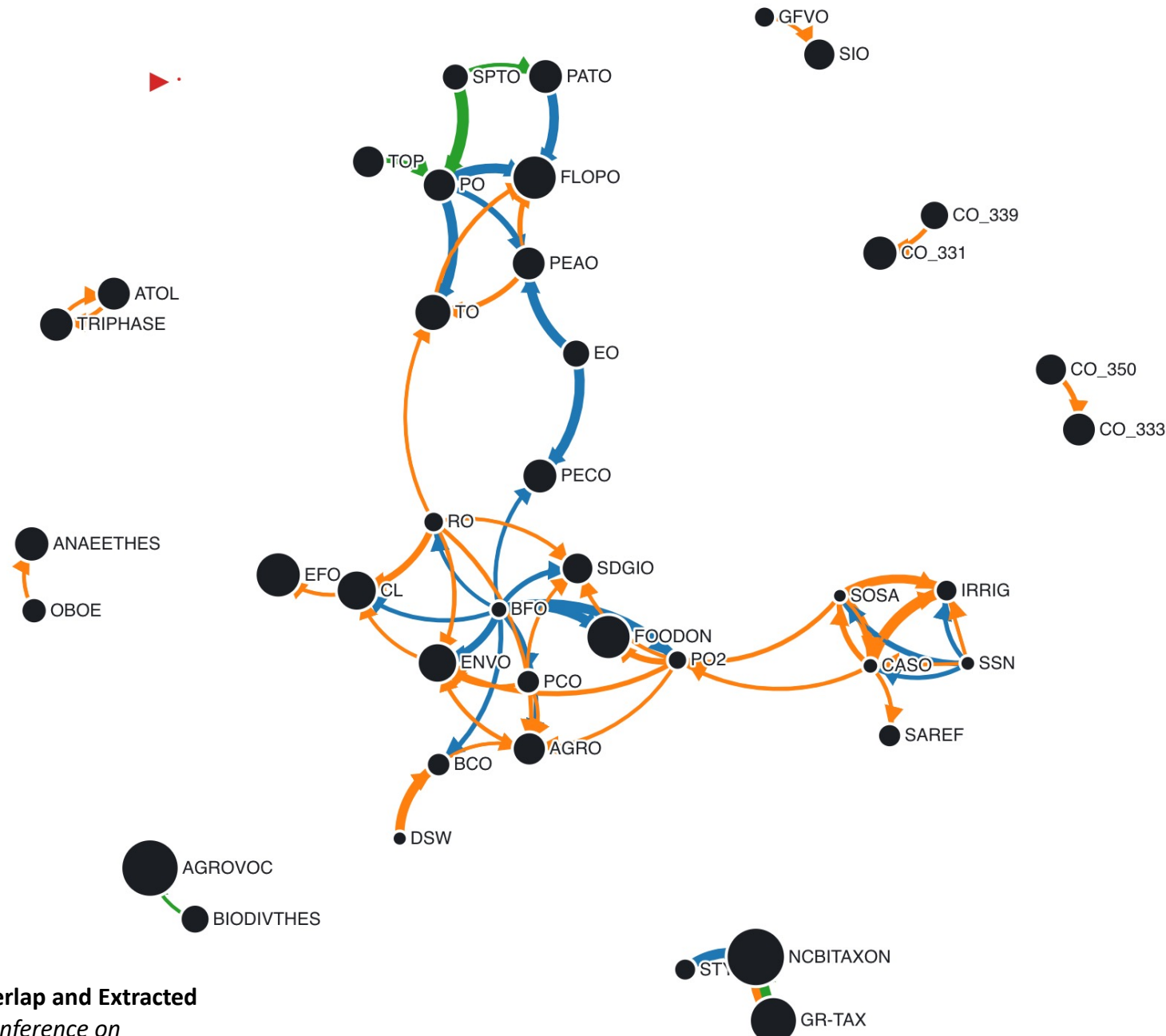


“Basically, we’re all trying to say the same thing.”

All aspects of ontology alignments



Term reuse, term overlap and extracted mappings



Align ontologies one another

AgroPortal LIRMM

Browse Search Mappings Recommender Annotator Projects Admin

Recently Viewed | antool

AnaEE Thesaurus

Summary Classes Properties Notes Mappings Widgets Edit ontology information Add submission Edit submission information (1.0)

Jump To:

- abiotic environment
- AnaEE-France service identification and partners
- biotic environment
- chemical compound
- carbon forms
 - carbon dioxide**
 - carbonate
 - Dissolved organic carbon
 - inorganic carbon
 - insoluble organic carbon
 - organic carbon
 - Particulate organic carbon
 - total carbon
 - total organic carbon
- chemical elements
 - chloride
 - ions
 - metals
 - molecule
 - nitrogen forms
 - organic matter
 - organic molecules
 - oxygen forms
 - pesticide
 - phosphorus forms
 - pollutant
 - reactive oxygen species

concept by concept

Details Visualization Notes (0) **Class Mappings (4)**

[Create New Mapping](#) [Create New External Mapping](#)

Internal mappings

MAPPING TO	ONTOLOGY	SOURCE	RELATION
carbon dioxide	Environment Ontology	LOOM	
carbon dioxide	Experimental Factor Ontology	LOOM	
CarbonDioxide	XEML Environment Ontology	LOOM	
Carbon dioxide	Biorefinery	LOOM	

Interportal mappings

MAPPING TO	ONTOLOGY	SOURCE	RELATION
There are currently no interportal mappings for this class.			

External mappings

MAPPING TO	ONTOLOGY	SOURCE	RELATION
There are currently no external mappings for this class.			

Mappings

ONTOLOGY	MAPPINGS
Agri-Food Experiment Ontology	1
Agricultural Experiments Ontology	5
Banana Anatomy	2
Basic Formal Ontology	1
Biorefinery	13
Cell Ontology	4
Chickpea Ontology	14
Comparative Data Analysis Ontology	3
Durum Wheat	2
EDAM bioinformatics operations, data types, formats, identifiers and topics	25
Environment Ontology	72
Environment Ontology for Livestock	10
Experimental Factor Ontology	93
Gene Ontology	5
GENO Ontology	5
Genomic Feature and Variation Ontology	5
Gramene Taxonomy Ontology	3
Groundnut Ontology	16
IBP Cassava Trait Ontology	23
IBP Cowpea Trait Ontology	25
IBP Crop Research Ontology	22

Enable to store external mappings i.e., mappings that only one part is in BioPortal

Banana Anatomy

Summary Classes Properties Notes

Jump To:

- CGIAR_Musa_anatomy
 - plant part
 - corm
 - inflorescence**
 - leaf
 - pseudostem
 - root
 - sucker
- CGIAR_Musa_development

Details Visualization Notes (2) **Class Mappings (4)**

Create New Mapping

Create New External Mapping

Internal mappings

MAPPING TO	ONTOLOGY	SOURCE	RELATIONS
inflorescence	Experimental Factor Ontology	LOOM	
inflorescence	Plant Ontology	LOOM	
inflorescence	Plant Trait Ontology	LOOM	

Interportal mappings

MAPPING TO	ONTOLOGY	SOURCE	RELATIONS
There are currently no interportal mappings for this class.			

External mappings

MAPPING TO	ONTOLOGY	SOURCE	RELATIONS
Spadice	http://dbpedia.org/ontology/	REST	skos:broadmatch

REST Service API:

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

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 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">Using the <code>apikey</code> query string parameterProviding an <code>Authorization</code> header: <code>Authorization: apikey token=your_apikey</code> (replace 'your_apikey' with your actual key)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.
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 of <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=prefixLabel,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>

SPARQL httpd server v1.1.5-122-g1788d29 test query

KB ontologies_api

```
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
```

Soft limit xml

Harvesting AgroPortal ontologies and vocabularies into FAIRsharing

Use AgroPortal to access and share ontologies. You can create ontology based annotations for your own test. Link your own project that uses ontologies to the description of those ontologies, review and comment on ontologies and their components as you explore them. Sign in to AgroPortal to submit a new ontology or ontology based project, provide comments on ontologies or add ontology mappings.

Current Release: 4.24 (February 2016)
Issue tracking on [GitHub](#)

Search all ontologies

Find an ontology

Links

Ontology Writs (April 2017)

Statistics

Latest Notes

Latest Mappings

Skins

Supported by ANR

With the collaboration of SIFR project, INRA, IRD, CIRAD

Powered by NCRO BioPortal



FAIRsharing.org
standards, databases, policies

AnaEE Thesaurus
Abbreviation: anaeeThes

General Information

The anaeeThes thesaurus aims at providing a controlled vocabulary for the se of the AnaEE-France infrastructure through an iterative process combining be AnaEE data bases and/or modeling platforms. The thesaurus consists of conce plants, micro-organisms, biodiversity); chemical compounds; experimentation functioning); modeling (e.g. formalism, platform, type of model, computer lang standards ontology).

How to cite this record: FAIRsharing.org: anaeeThes; AnaEE Thesaurus; DOI: h
Homepage <http://agroportal.lirmm.fr/ontologies/ANAETHES>

Developed in France

Created in 2017

Taxonomic range

All

Scope and data types

Agricultural And Food Process Engineering Atmospheric Science Biodiversity Chemical E
Modelling And Simulation Natural Resources, Earth And Environment Protocol Unit

Both manually curate the metadata ... better synchronization of the fields to come...

AgroPortal has a new metadata model of 127 properties to describe ontologies & vocabularies



Conclusions



ANR Project D2KAB: Data to Knowledge in Agronomy and Biodiversity (2019-2023)



Create a framework to **turn agronomy and biodiversity data into knowledge –semantically described, interoperable, actionable, open–** and investigate scientific methods and tools to exploit this knowledge for applications in science & agriculture

- How: Ontologies & Linked Open Data

- 1 work-package on building and harnessing **knowledge graphs**
- 2 work-packages of **driving ag & biodiv projects** (food packaging, agro-agri linked data, wheat phenotype, ecosystems & plant biogeography)





We develop and maintain ontology repositories in the OntoPortal Alliance (1/2)



BioPortal

Welcome to BioPortal, the world's most comprehensive repository of biomedical ontologies

Search for a class: Enter a class, e.g. Melanoma

Find an ontology: Start entering ontology name, e.g. Cancer, then choose from list

Ontology Visits (July 2017): Bar chart showing visits for various ontologies like CPT, ROKMRA, MEDORA, SNOMEDCT, NCIPT.

BioPortal Statistics: Ontologies: 596, Classes: 8,174,420, Resources Indexed: 48, Indexed Records: 38,537,360, Direct Annotations: 95,468,433,792, Direct Plus Expanded Annotations: 144,789,382,912

PRODUCTS: BioPortal, BioPortal REST API, BioPortal Virtual Appliance, NCBO Web Widgets

SUPPORT: Contact Us, Documentation, NCBO Wiki

ABOUT: About Us, Mission & Vision, Team, Projects

CONNECT: Facebook, Twitter, RSS

The National Center for Biomedical Ontology was founded as one of the National Centers for Biomedical Computing, supported by the NIH, the NH&I, and the NH Common Fund under grant USA-H000403.

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777E US 1 PRIVACY POLICY | TERMS

<http://bioportal.bioontology.org>



INRAE
la science pour la vie, l'humain, la terre

AgroPortal

Search all ontologies: Enter ontology, e.g. Melanoma

Find an ontology: Start entering ontology name, e.g. INRAE, then choose from list

Ontology Visits (April 2017): AGROVOC, ANIMALTHESES, National Agricultural Library Thesaurus (NAL), OntoBiotope (ONTOBIOTOP), Protein Ontology (PRO)

Label Notes: Terms in double (BIF) Wheat Trait Ontology, A bunch of the terms in this branch are in Arabic. Is this normal?, Un peu d'histoire (Beneux Anstems), Influence est un mot d'origine latine qui signifie "force", il est le même en français et en... Can resources be mapped to another ontology? (Beneux Anstems), Is another kind of inference for beneux? (Beneux Anstems), Can we consider spider an appropriate inference for beneux?

Label Mappings: metabolic pathway (GO) ↔ Metabolic Pathway, GTPase (GO) ↔ GTPase, GTPase (GO) ↔ GTPase, GTPase (GO) ↔ GTPase, GTPase (GO) ↔ GTPase

Statistics: Ontologies: 63, Classes: 1,194,312, Individuals: 1,171,617, Projects: 19, Users: 63

<http://agroportal.lirmm.fr>



EcoPortal

Search for a class: Enter a class, e.g. Shape, Trait, etc.

Find a semantic resource (ontology, thesaurus, etc.): Start entering ontology name, e.g. PhysioTrait, then choose from list

Ontology Visits (June 2019): Bar chart showing visits for various ontologies.

Ecoportal Statistics: Ontologies: 6, Classes: 117

PRODUCTS: EcoPortal REST API

SUPPORT: Contact Us, Help

ABOUT: About Us, Team, Projects

CONNECT: Facebook, Twitter, RSS

LifeWatch ERIC

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Powered by NCBO BioPortal

<http://ecoportal.lifewatchitaly.eu>



We develop and maintain ontology repositories in the OntoPortal Alliance (2/2)



MatPortal

Welcome to MatPortal, the ontology repository for materials science, Beta Test!

Search for a class: Enter a class, e.g. Aluminium

Find an ontology: Start typing ontology name, then choose from list

Ontology Visits (May 2021)

Ontology	Visits
HMIRVOCAB	~100
ML_TENGLE	~80
BWMO-DOMAN	~60
EMBO	~40
MOO-FULL	~20

MatPortal Statistics

Category	Count
Ontologies	12
Classes	4,983

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MedPortal

Browse the library of ontologies

Showing 6 of 45 Sort: Popular

- Human Phenotype Ontology China (HPCH)** (31,808)
The Human Phenotype Ontology China is being developed to provide a structured and controlled vocabulary for the phenotypic features encountered in human hereditary and other disease.
Uploaded: 11/2/19
- International Classification of Diseases, 10th Edition, China (ICD10CN)** (53,171)
International Classification of Diseases, 10th Edition, Version 10th, China.
Uploaded: 11/1/19
- International Classification of Diseases, 11th Edition, China (ICD11CN)** (33,460)
International Classification of Diseases, 11th Edition, Version 10th, China.
Uploaded: 11/1/19
- Basic Formal Ontology (Chinese Translation) (BFO-ZH)** (37)
A Chinese translated version of the BFO-2.0.
Uploaded: 11/4/20
- Cell Line Ontology (Chinese Translation) (CLO_SCN)** (4,809)
中文细胞系本体, 数据基于国家实验细胞资源服务共享平台, 框架源于CLO (cell line ontology) 本体框架, 适用于中文语言环境的CLO中文汉化版本。
Uploaded: 11/2/19

<http://medportal.bmicc.cn/>

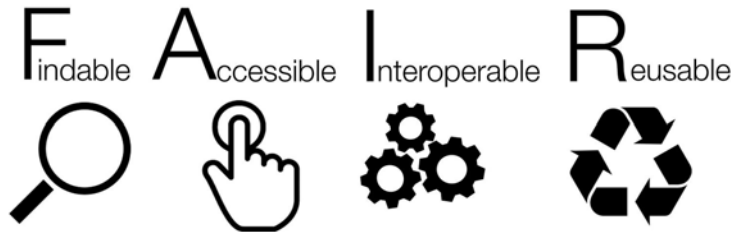
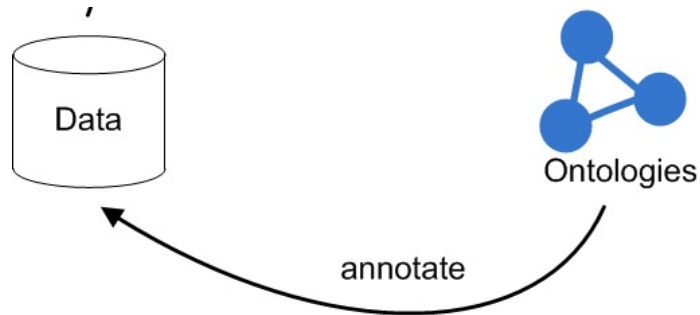
And other installations with





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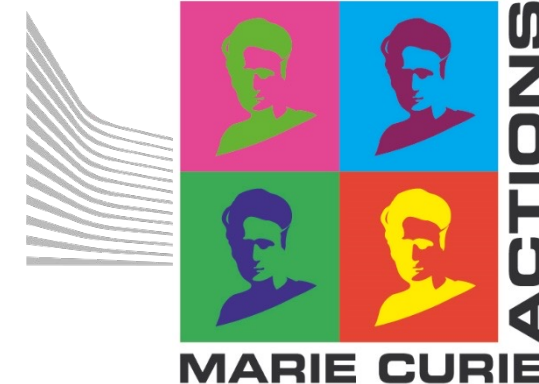
Credits (people & support)

OntoPortal team (from 2015 to 2021)

- Vincent Emonet
- Anne Toulet
- Andon Tchechmedjiev
- Amine Abdaoui
- Elcio Abrahao
- Amir Laadhar
- Jerome Lamarque
- Emna Amdouni
- Syphax Bouazzouni



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Questions ?

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