



Les portails d'accès aux ressources sémantiques

Ecole thématique E-Envir, Gif-sur-Yvette, Octobre 2019

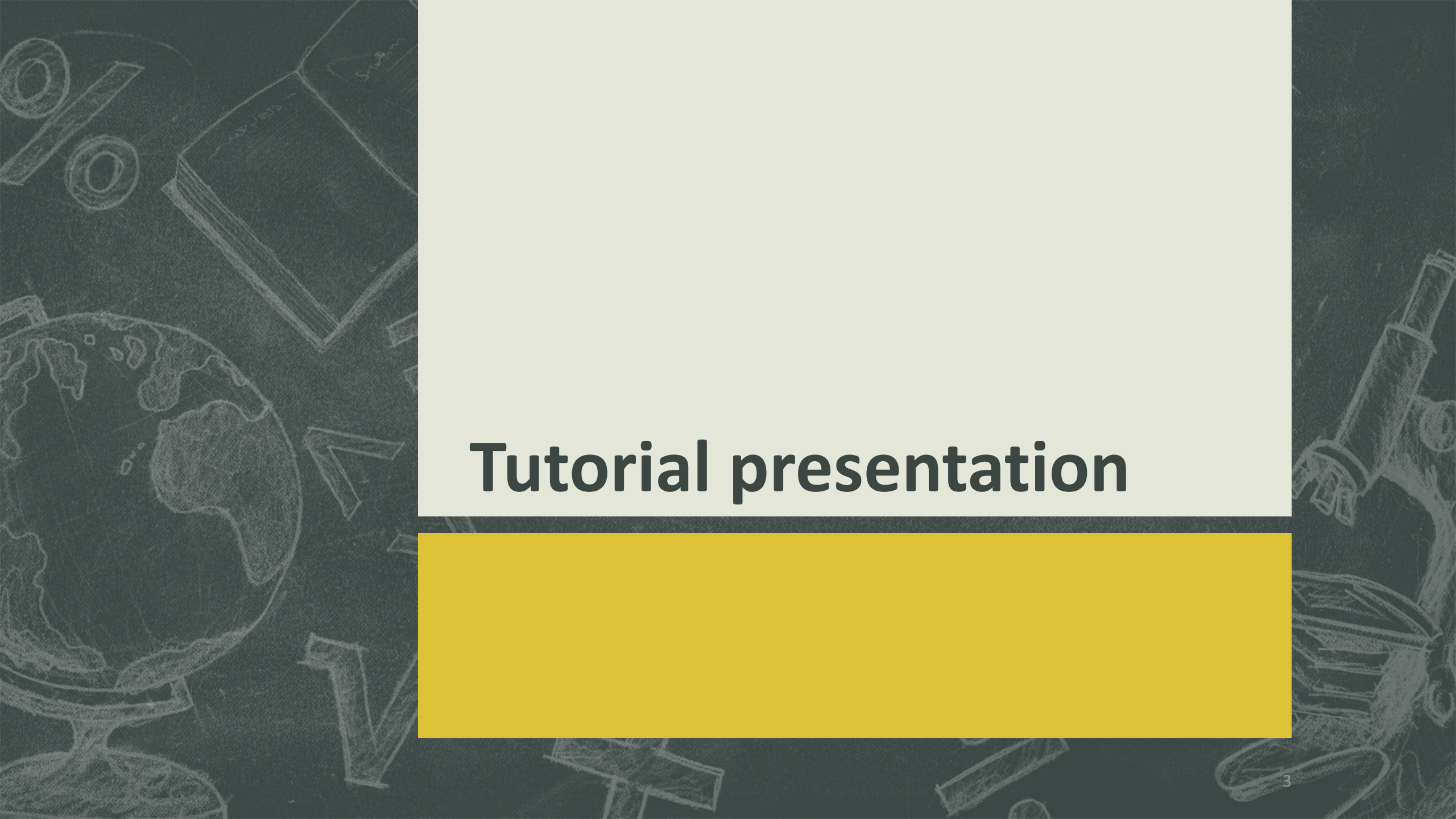




Tutorial: “How to use ontology repositories and ontology-based services”

DATA FAIRness International Summer School
Lecce, July 3rd 2019



A dark grey background featuring a collage of white, chalk-like sketches of various educational and scientific icons. These include a globe, a microscope, a book, a percentage sign, a ruler, a compass, a satellite, and various geometric shapes and symbols.

Tutorial presentation

Who am I?



Clement Jonquet

Associate Professor,
University of Montpellier,
PI of AgroPortal, SIFR &
D2KAB projects



- « Disclaimer »
 - Despite the availability of concrete platforms, this remains a research activity (in progress)
 - Excuse bugs, inconsistencies, misunderstanding, limits
 - We will not have an answer to everything

With support of:

- ANR D2KAB
- H2020 SIFRm



Tutorial objectives

Work with Bio/Agro/EcoPortal platform

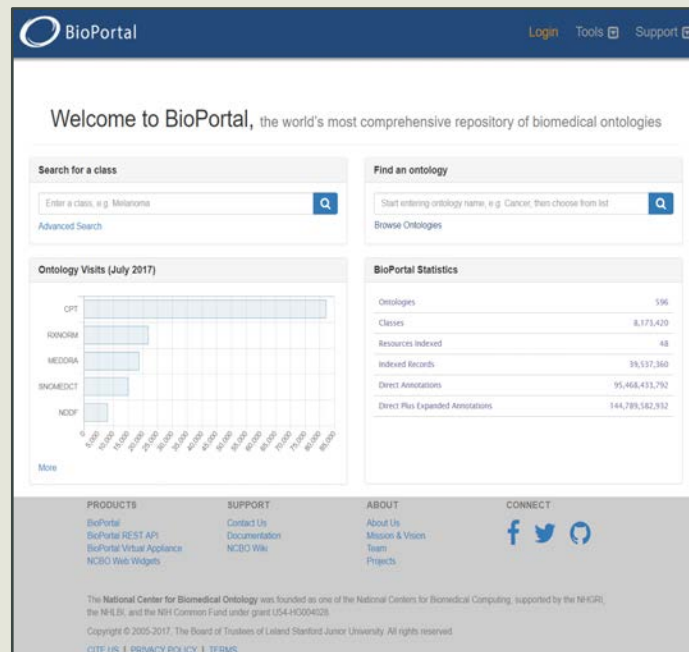
Describe your ontology using standard vocabularies

Interconnect your ontology to the rest of the world

Annotate text with ontologies

Manipulate APIs (REST or SPARQL) to automate tasks

Ontology repository technology developed for the NCBO BioPortal project



Logo: BioPortal

Navigation: Login Tools Support

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

Search for a class

Enter a class, e.g. Melanoma

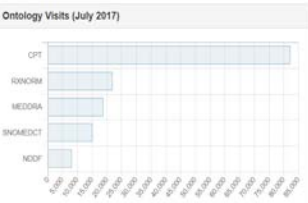
Advanced Search

Find an ontology

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

Browse Ontologies

Ontology Visits (July 2017)



More

BioPortal Statistics

Category	Count
Ontologies	596
Classes	8,173,429
Resources Indexed	48
Indexed Records	38,537,360
Direct Annotations	95,468,433,792
Direct Plus Expanded Annotations	144,789,582,932

PRODUCTS

- BioPortal
- BioPortal REST API
- BioPortal Virtual Appliance
- NCBO Web Widgets

SUPPORT

- Contact Us
- Documentation
- NCBO Wiki

ABOUT

- About Us
- Mission & Vision
- Team
- Projects

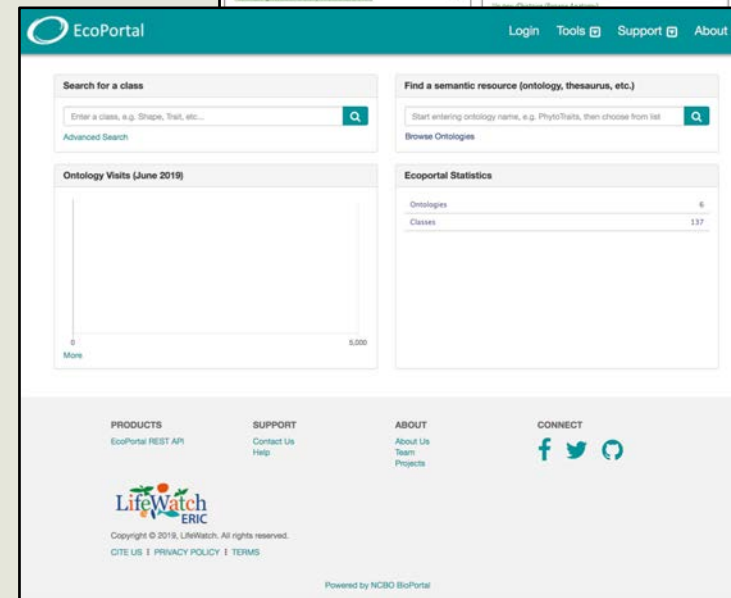
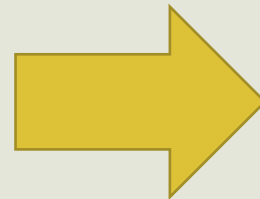
CONNECT

f t o

The National Center for Biomedical Ontology was founded as one of the National Centers for Biomedical Computing, supported by the NIGMS, the NHLBI, and the NIH Common Fund under grant USA-H1004020.

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Logo: EcoPortal

Navigation: Login Tools Support About Us

Search for a class

Enter a class, e.g. Shape, Trait, etc...

Advanced Search

Find an ontology

Start entering ontology name, e.g. PhytoTraits, then choose from list

Browse Ontologies

Ontology Visits (June 2019)



More

Ecoportal Statistics

Category	Count
Ontologies	6
Classes	137



Medical Subject Headings, version française

Summary Classes Properties Notes Mappings Widgets

Details

Go to the NCST API JSON entry

ACRONYM	MDHREF
Public	Public
Le Med	Le Med
NLM sup	NLM sup
in cache	in cache

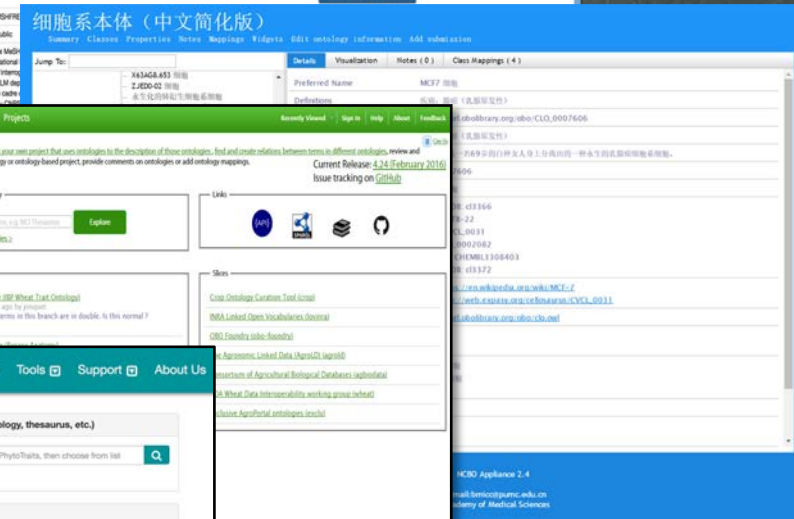
Jump To:

- 1434GB-453 (100%)
- 2-4520-02 (100%)
- 6-4520-02 (100%)

Preferred Name: MCF7 (100%)

Publication: (100%)

Class Mappings (4)



细胞系本体 (中文简化版)

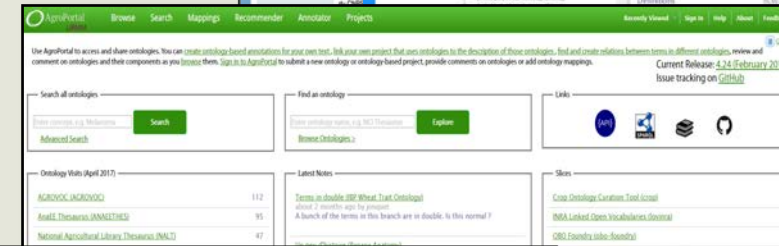
Summary Classes Properties Notes Mappings Widgets

Go to the NCST API JSON entry

Preferred Name: MCF7 (100%)

Publication: (100%)

Class Mappings (4)



Logo: AgroPortal

Navigation: Browse Search Mappings Recommender Annotator Projects

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.

Current Release: 4.24 (February 2016)

Issue tracking on GitHub

Search all ontologies

Enter ontology name, e.g. Melanoma

Advanced Search

Find an ontology

Enter ontology name, e.g. MCF7

Browse Ontologies

Ontology Visits (April 2017)

Ontology	Visits
AGROVOC-AGROVOC	112
AGROVOC-AGROVOC	95
National Agricultural Library Thesaurus (NAL)	67

Latest Notes

Terms in double (MCF7) without Trait Ontology about 2 months ago for project

A bunch of the terms in this branch are in double. Is this normal?

See also: Ontology Based Annotations

Links

- Core Ontology Curators Tool (local)
- PMMA Linked Open Vocabularies (external)
- NCBO's Linked Open Vocabularies (external)
- AgroPortal's Linked Open Vocabularies (external)

Skins

- AgroPortal's Linked Open Vocabularies (external)
- PMMA Linked Open Vocabularies (external)
- NCBO's Linked Open Vocabularies (external)
- AgroPortal's Linked Open Vocabularies (external)



NCBO Appliance 2.4

Small BioPortal Virtual Appliance

University of Medical Sciences

Tutorial plan

Ontology selection

metadata
search
recommender

Drop & use an ontology

browsing
visualization
API

Semantic annotation of text

annotator

Ontology alignments management

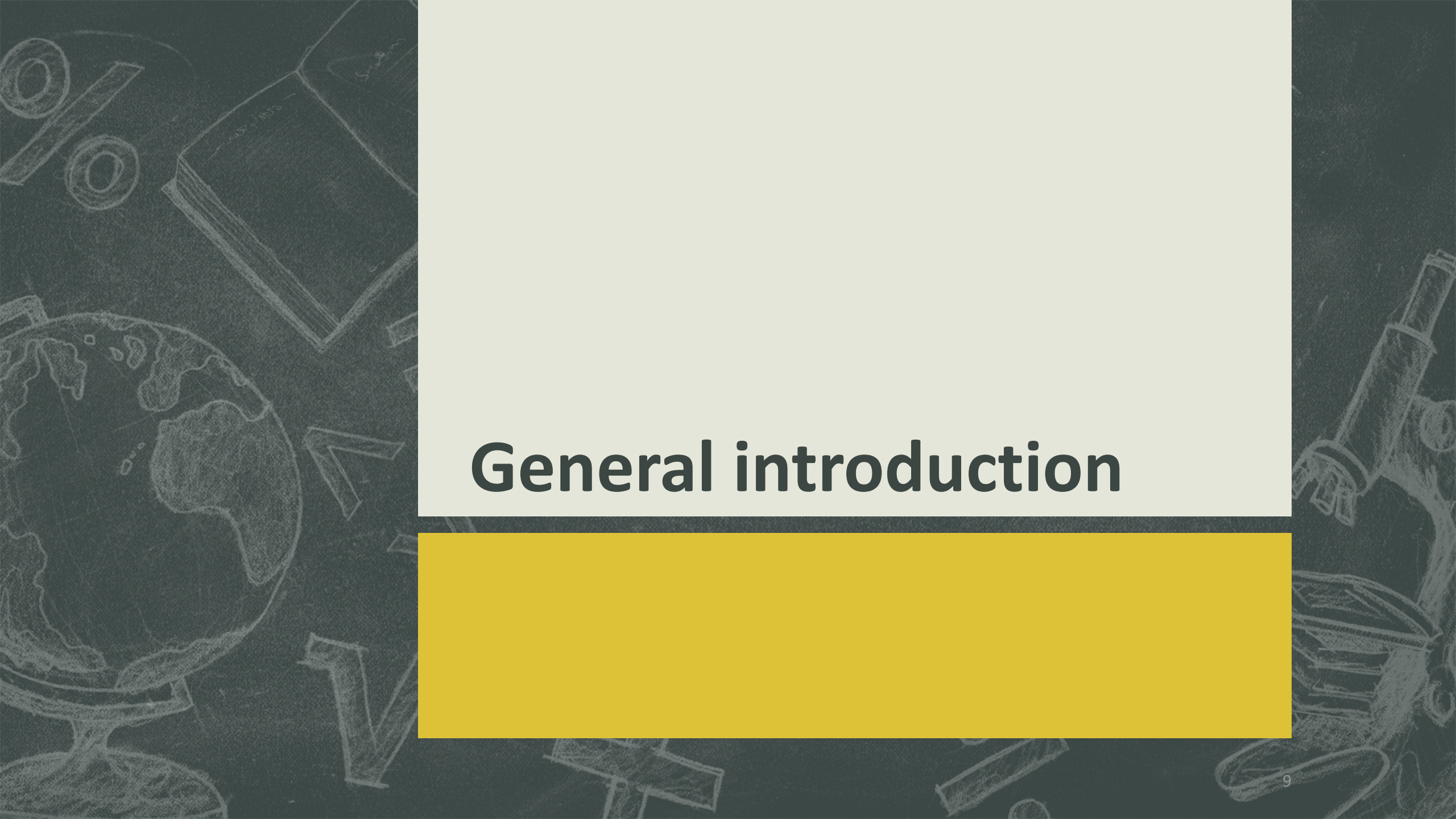
create
retrieve
API

Automatize access with API

REST
SPARQL

Who are you?

- Have you ever used ontologies (or terminologies in general)? BioPortal?
 - For which task?
 - Much interested in your feedback
- Your background?
- Why are you here today?
 - Super quickly
- Check: Access to slides?

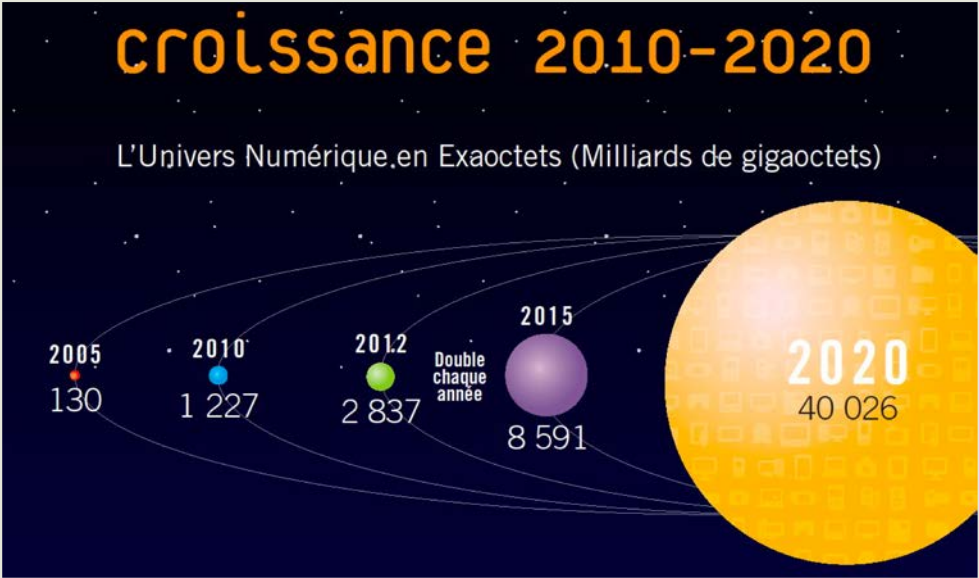
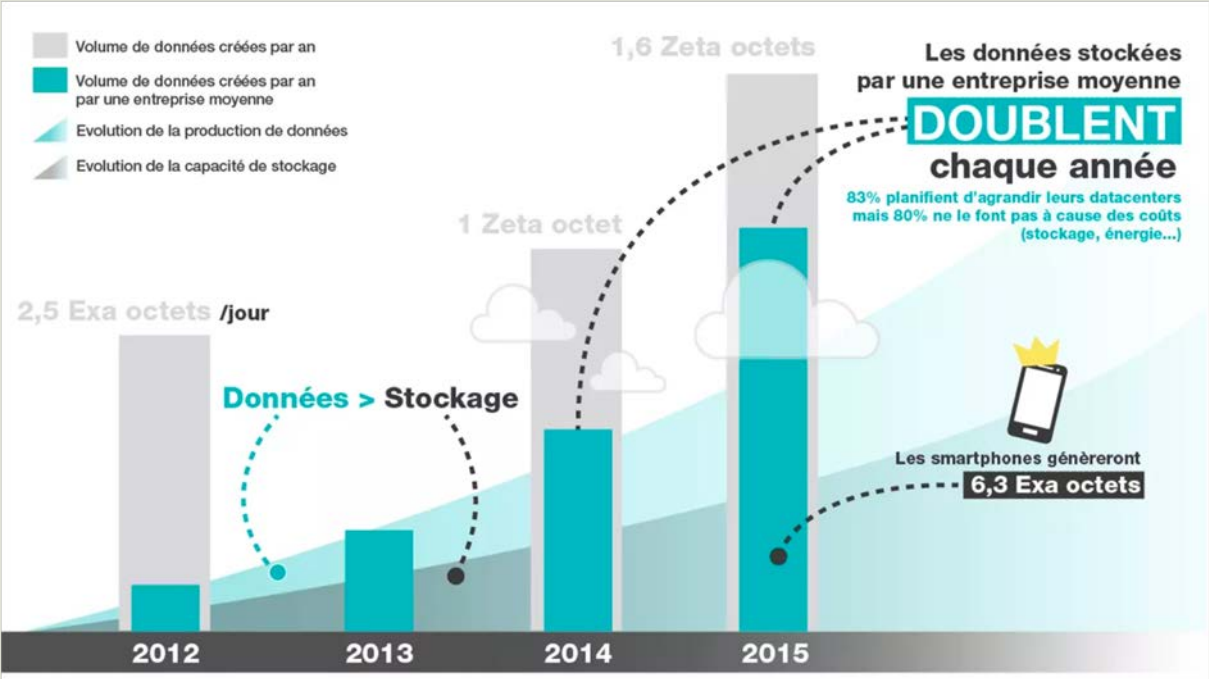
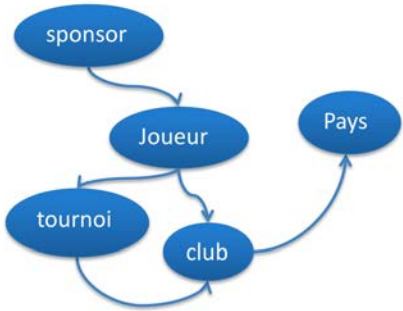
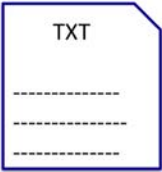
A dark grey background featuring a collage of white, hand-drawn educational icons. These include a globe, a stack of books, a microscope, a test tube, a compass, and various geometric shapes like circles and rectangles. The icons are scattered across the background, with some appearing more prominent than others.

General introduction

Data explosion



N°SECU	NOM	VILLE
1234567890123	MARTIN	NICE
2345678901234	SIMON	LYON
1357924680123	BERNARD	PARIS



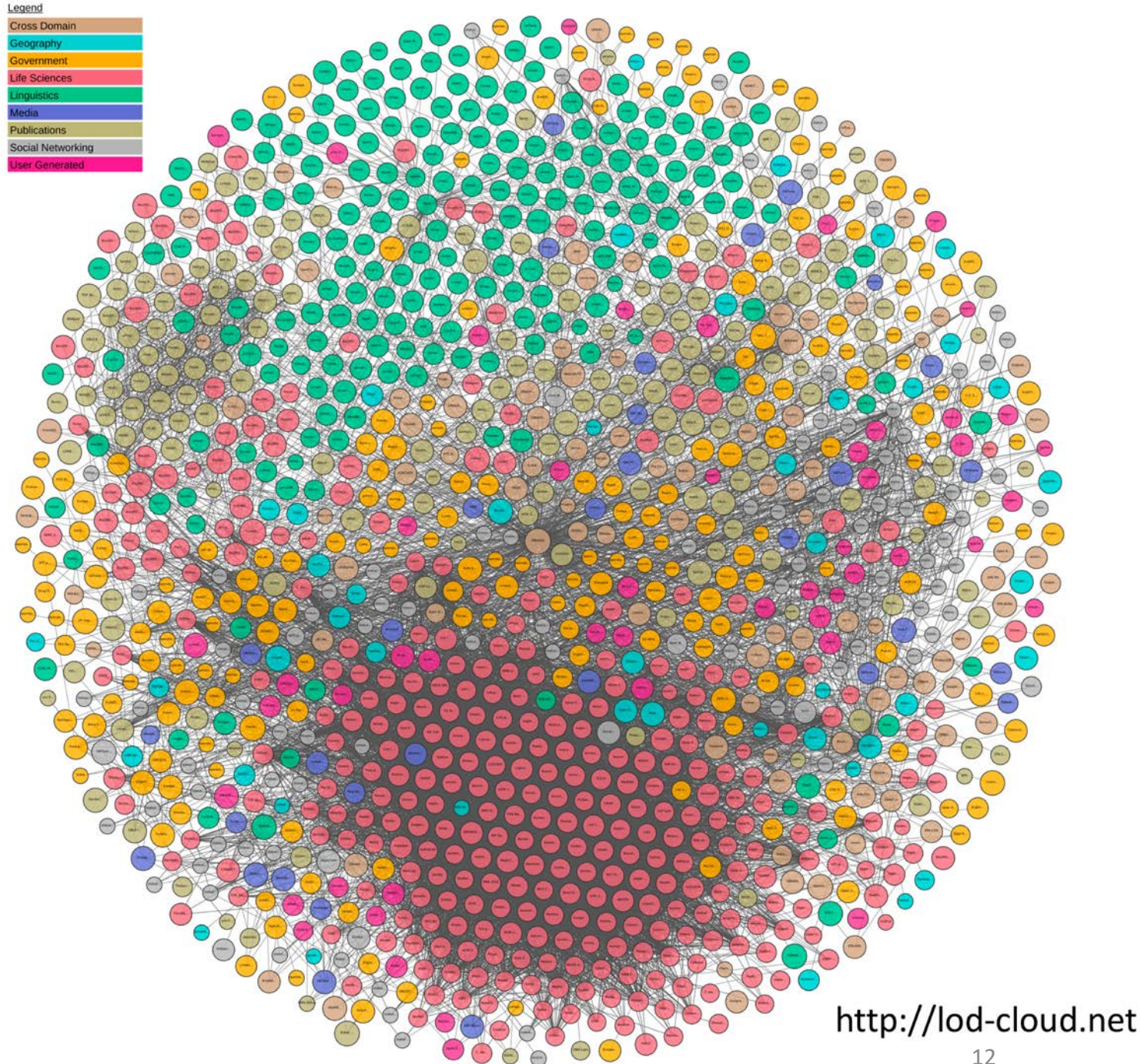
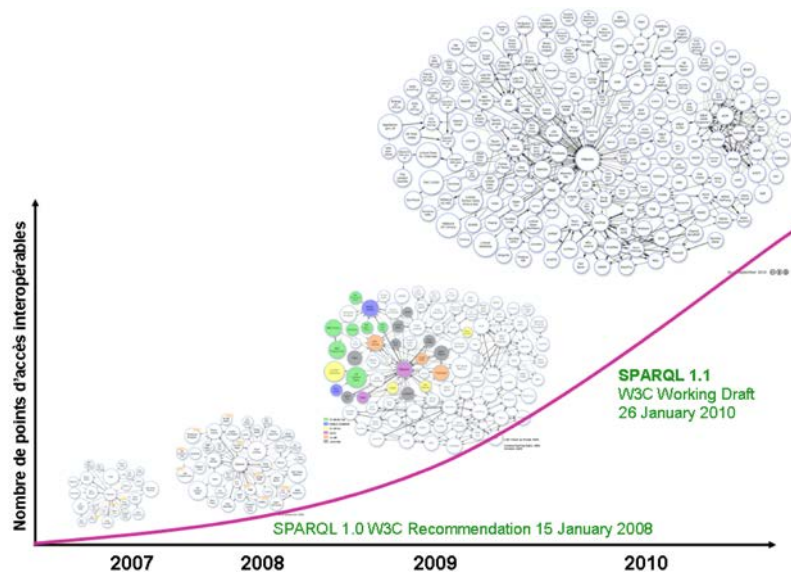


Big
Open
Linked

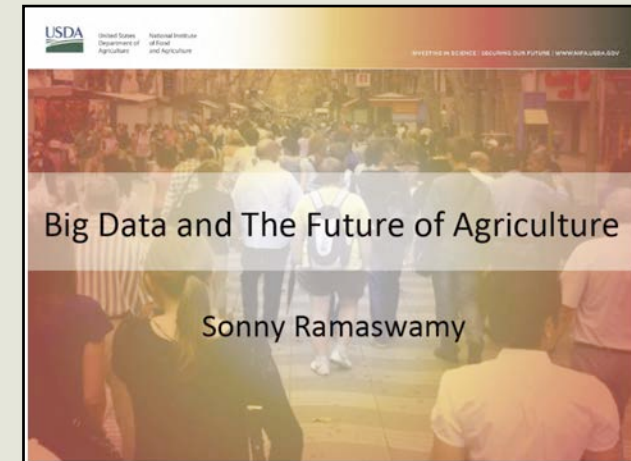


Our job is to structure these data

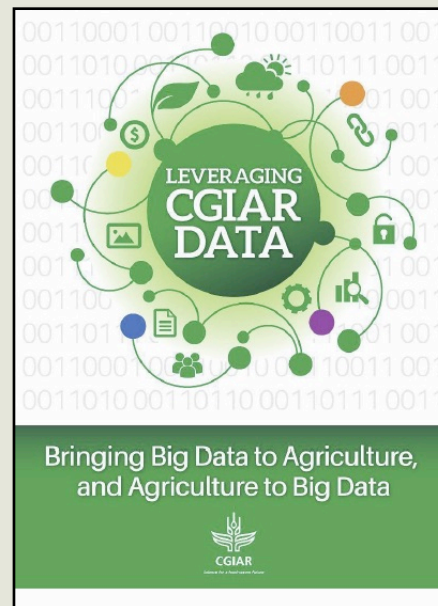
Linked Open Data create a « Web of data »



<http://lod-cloud.net>



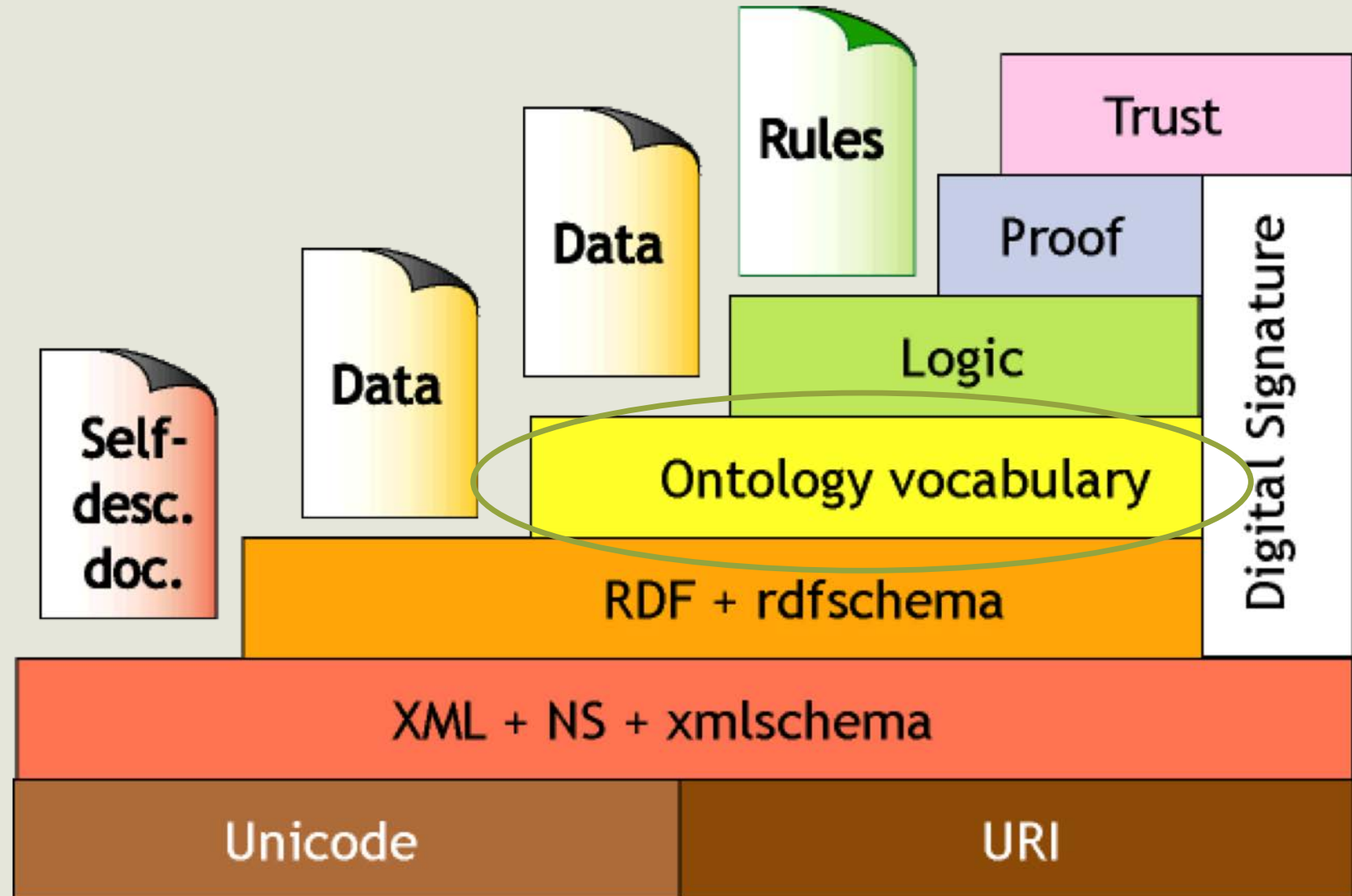
Big and open data is
also happening in
agriculture and
biodiversity



The Semantic Web offers the technologies

The FAIR principles have established the importance of using standards vocabularies or **ontologies to describe FAIR data** and to facilitate interoperability and reuse:

12. (meta)data use vocabularies that follow FAIR principles



URL

identify what
exists on the web.

<http://my-site.fr>



URI

identify,
on the web,
what exists.

<http://animals.org/zebra#this>



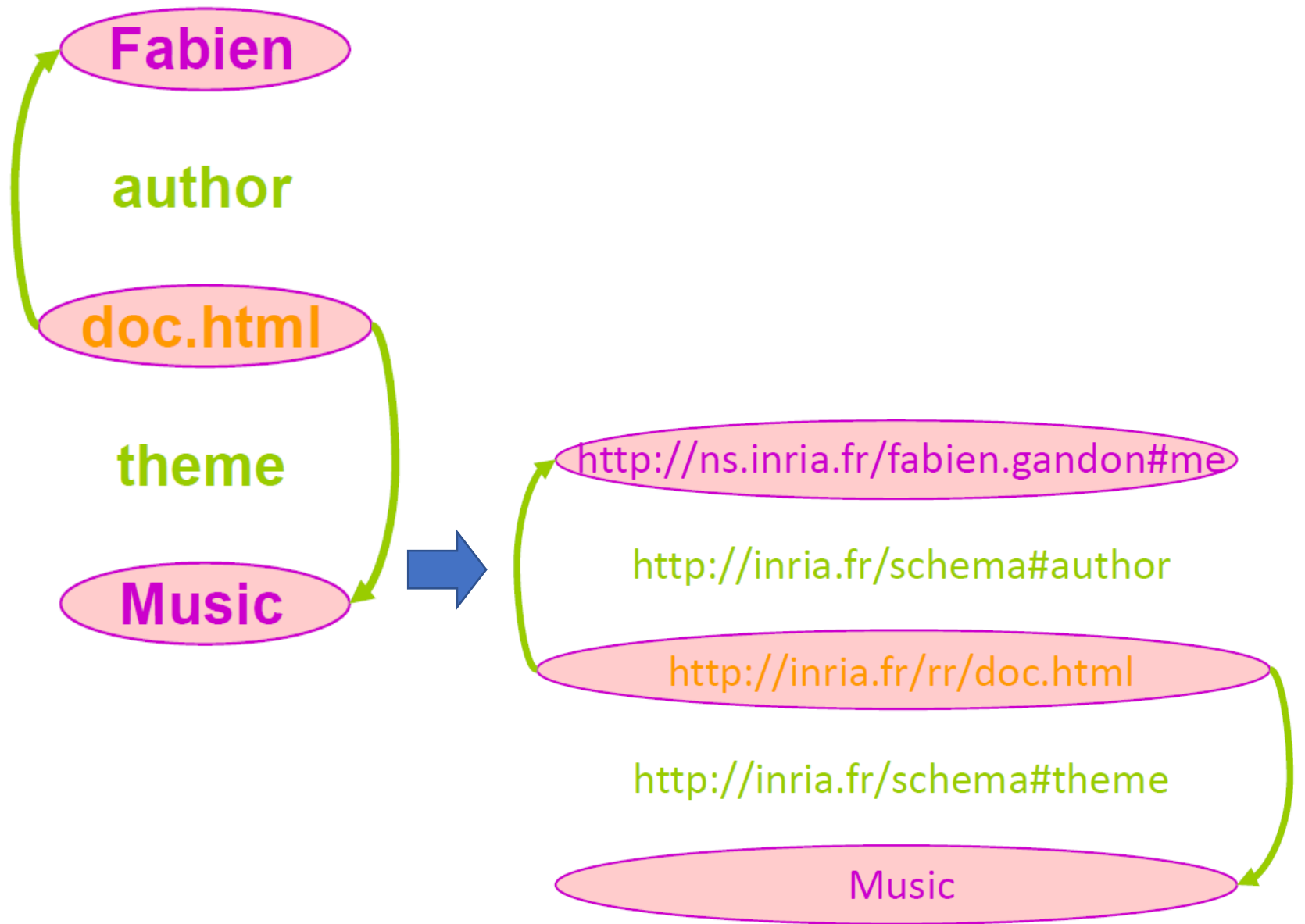
IRI

identify,
on the web,
in any language,
what exists.

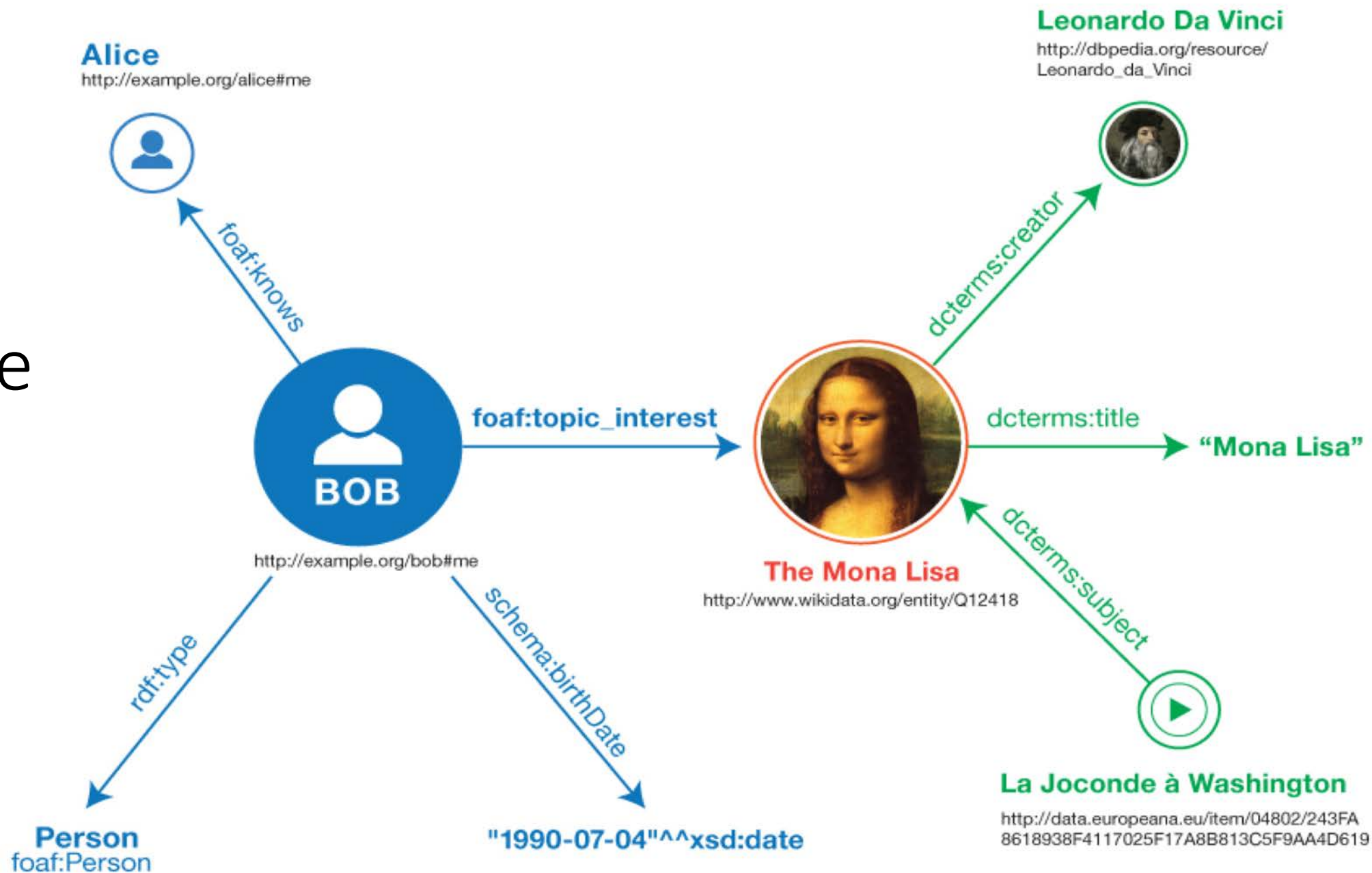
<http://الحيوانات.tn/斑馬#this>



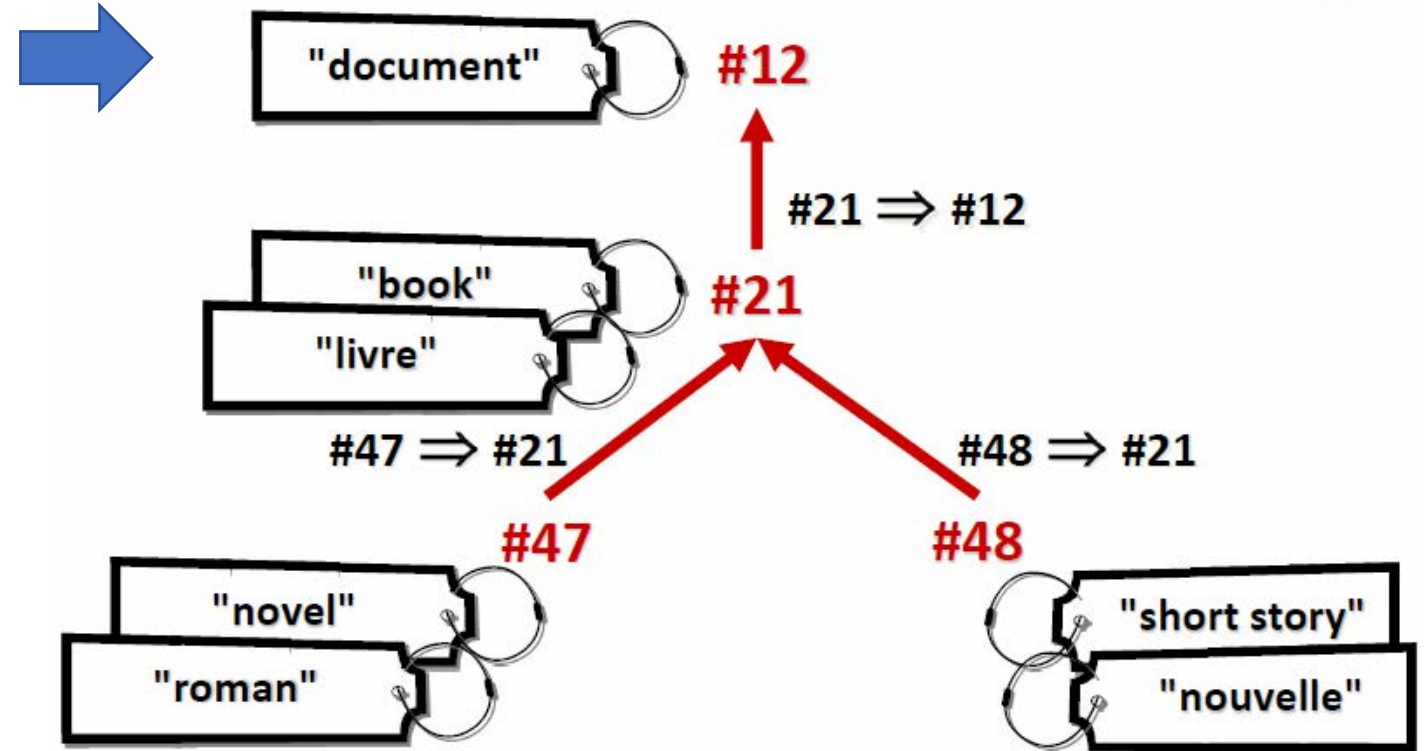
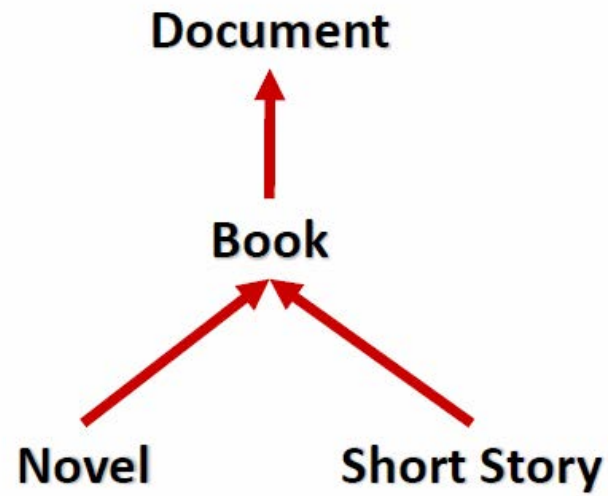
The Semantic Web relies on RDF



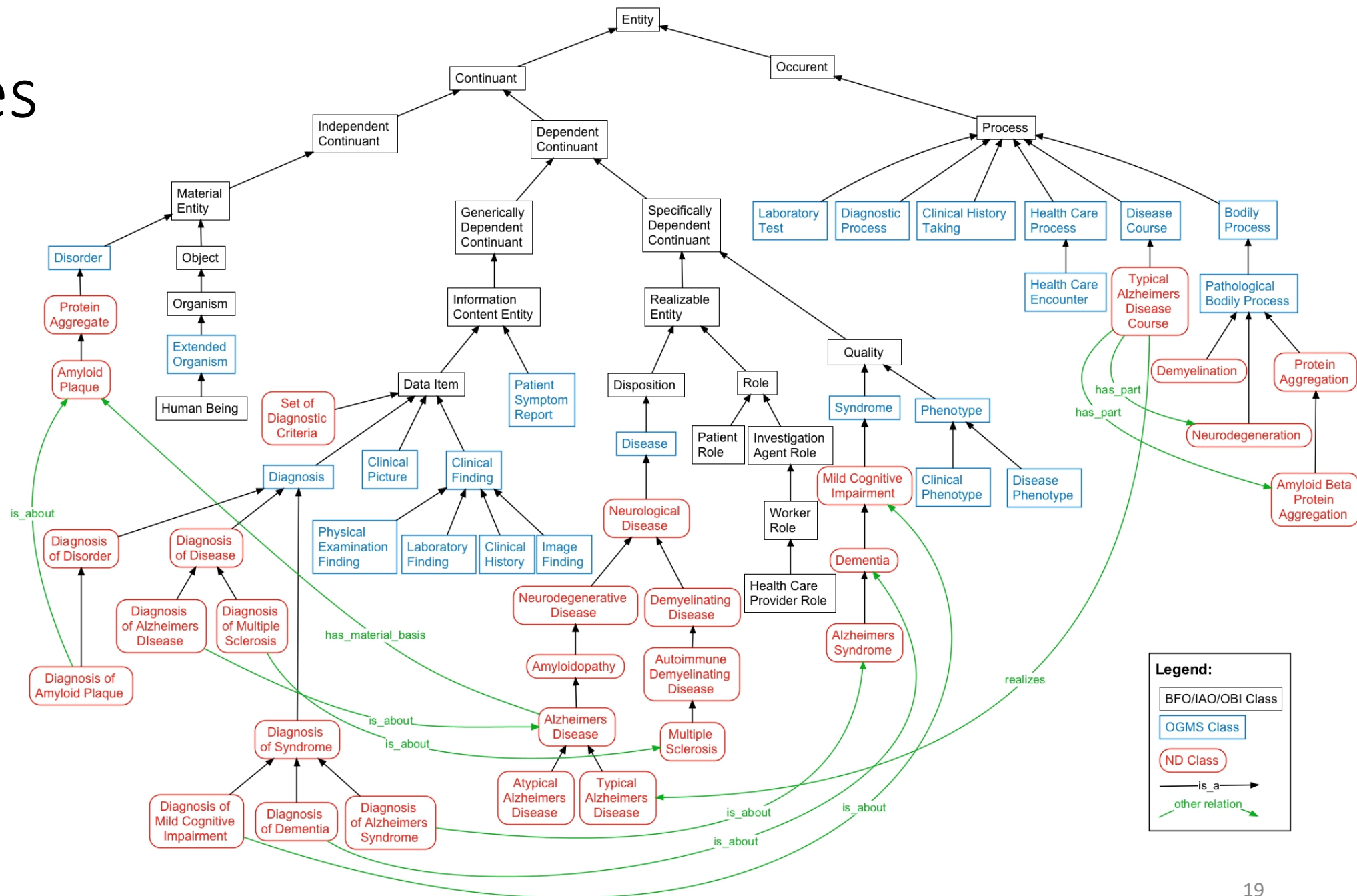
Knowledge graphs



Ontologies (small)



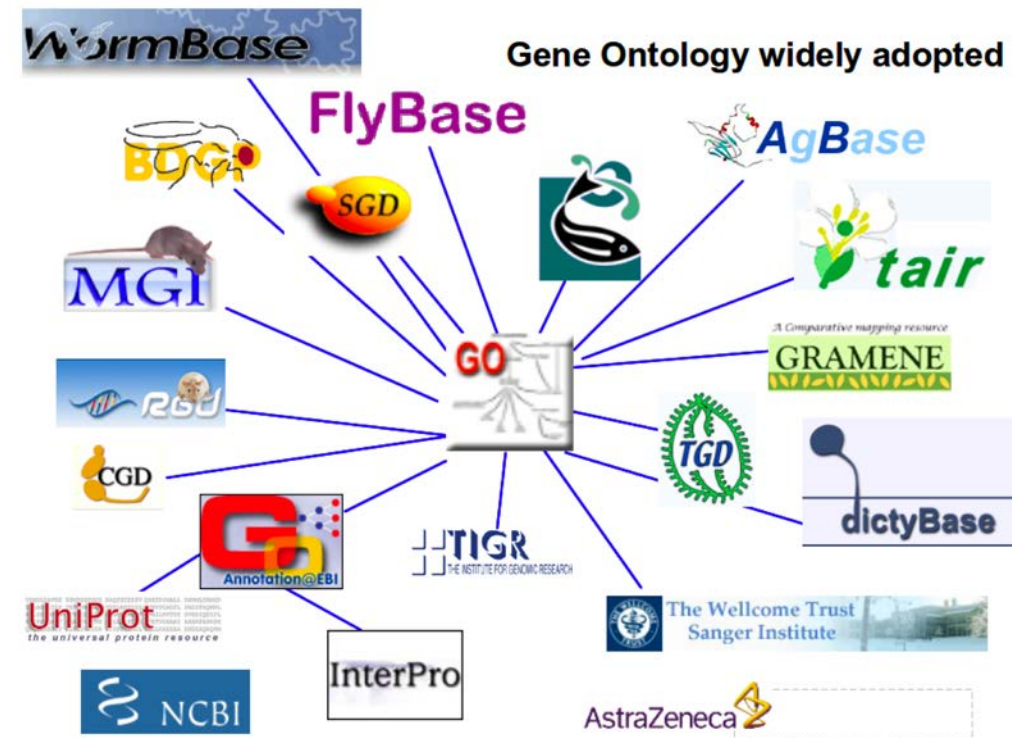
Ontologies (big)



Why ontologies are important in science?

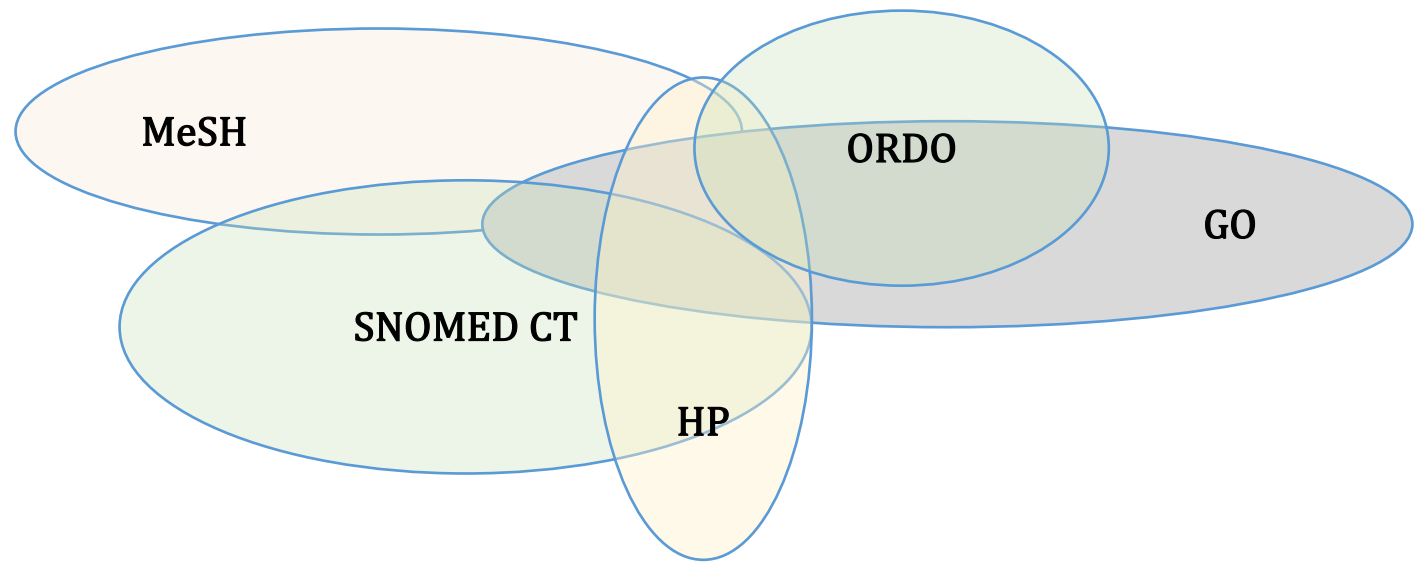


- To provide canonical **representation** and sharing of scientific knowledge
- To **annotate** experimental data to enable interpretation, comparison, and discovery across databases
- To facilitate **knowledge-based applications** for
 - Decision support, reasoning
 - Natural language-processing
 - Data integration

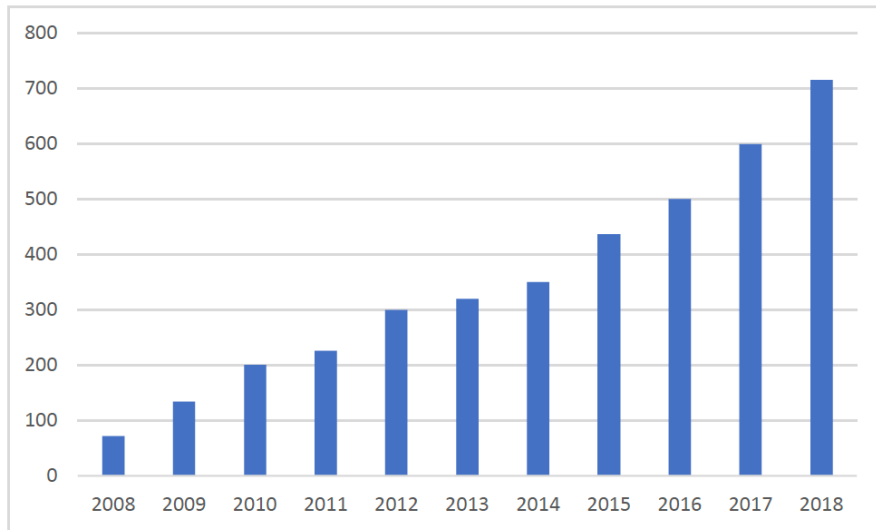


- But ontologies are: **spread out, in different formats, of different size, with different structures**

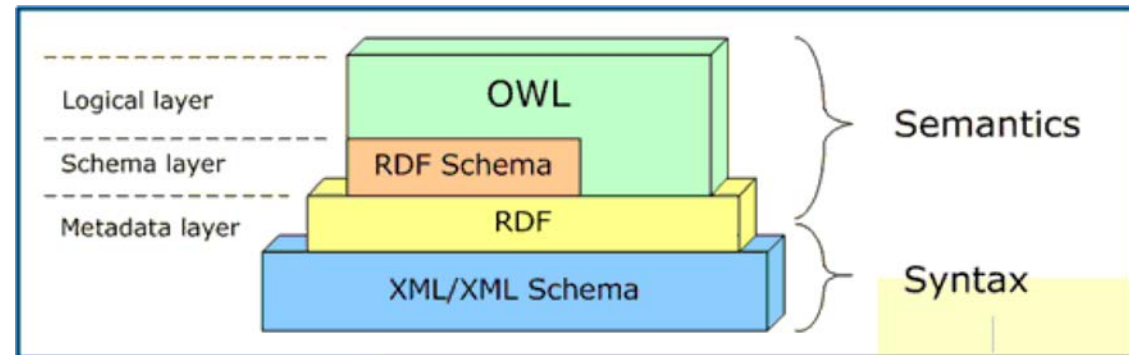
Other issues with ontologies



Overlapping ontologies



Number of ontologies in the NCBO BioPortal



Variety of representation languages

Ontology libraries, registries, repositories



- Ontology **libraries** defined as
 - *“a library system that offers various functions for **managing, adapting and standardizing groups of ontologies**. It should fulfill the needs for re-use of ontologies. In this sense, an ontology library system should be easily accessible and offer efficient **support for re-using** existing relevant ontologies and standardizing them based on upper-level ontologies and ontology representation languages.” [Ding & Fensel, 2001]*

Ontology repositories... a subject of study



- Defined by [Hartmann, Palma, Gomez-Perez, 2009] as:
 - “a structured *collection* of ontologies (...) by using an Ontology *Metadata Vocabulary*. References and *relations between ontologies* and their modules build the semantic model of an ontology repository. Access to resources is realized through *semantically-enabled interfaces* applicable for humans and machines. Therefore a repository provides a formal query language”
- Open Ontology Repository initiative (late 2000s)
- 2010 ORES workshop
- Review of ontology repositories
 - [Where to publish and find ontologies? D'Aquin & Noy, 2012]
 - New platform in 2015 Aber-OWL
 - OLS 3.0, AgroPortal release

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?
- How could you leverage your ontology to enable new **science**?
- How could you use ontologies without **managing** them ?

Findable **A**ccessible **I**nteroperable **R**e-usable

[Home](#)
[General Usage](#)
[Search](#)
[Annotator](#)
[Recommender](#)
[Resource Index](#)
[Batch](#)
[Ontology Analytics](#)
[Resources](#)
[Media Types and Hypermedia](#)

[Category](#)
[Class](#)
[Group](#)
[Instance](#)
[Mapping](#)
[Metric](#)
[Note](#)
[Reply](#)
[Ontology](#)
[Ontology Submission](#)
[Project](#)
[P](#)
[P](#)
[P](#)
[P](#)
[P](#)
[Conte](#)

SPARQL httpd server v1.1.5-122-j

KB ontologies_api

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 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 laig@cornellbioinformatics.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: - Using the <code>apikey</code> query string parameter - Providing an <code>Authorization</code> header: <pre>Authorization: apikey token=your_apikey</pre> (replace <code>your_apikey</code> 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

```

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

```



Focus on 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.



BioPortal

Login Tools Support

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

Search for a class

Enter a class, e.g. Melanoma

Advanced Search

Find an ontology

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

Browse Ontologies

Ontology Visits (July 2017)

Ontology	Visits (approx.)
CPT	85,000
RXNORM	25,000
MEDDRA	20,000
SNOMEDCT	15,000
NDDF	10,000

More

BioPortal Statistics

Ontologies	596
Classes	8,173,420
Resources Indexed	48
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BioPortal

BioPortal REST API

BioPortal Virtual Appliance

NCBO Web Widgets

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27

- Online support for ontology
 - Peer review & notes
 - Versioning
 - Mapping
 - Search
 - Resources
 - Annotation
- Open source technology
 - Packaged in a “virtual appliance”
 - Set up your own “bioportal” in a few days


Login Tools Support

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

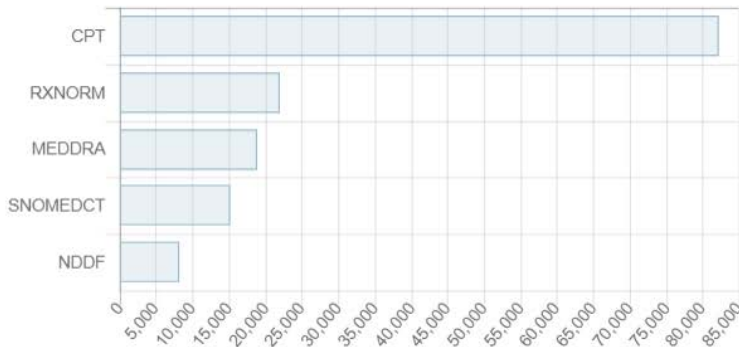
Search for a class

[Advanced Search](#)

Find an ontology

[Browse Ontologies](#)

Ontology Visits (July 2017)



More

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 Noy, N. F., Shah, N. H., Whetzel, P. L., ..., Jonquet C., ... & Musen, M. A. (2009). BioPortal: ontologies and integrated data resources at the click of a mouse. *Nucleic acids research*, 37(suppl_2), W170-W173. **+800 citations.**

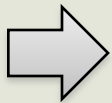
<http://data.bioontology.org>

Ontology
Services



- Search
- Traverse
- Comment
- Download

Mapping
Services



- Create
- Upload
- Download

Widgets



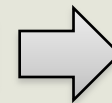
- Tree-view
- Auto-complete
- Graph-view

Annotation



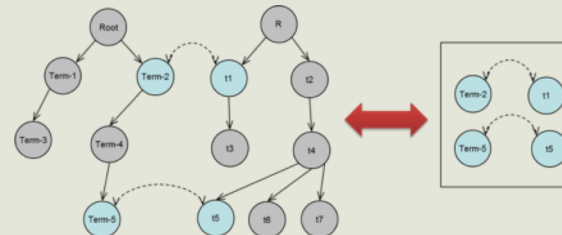
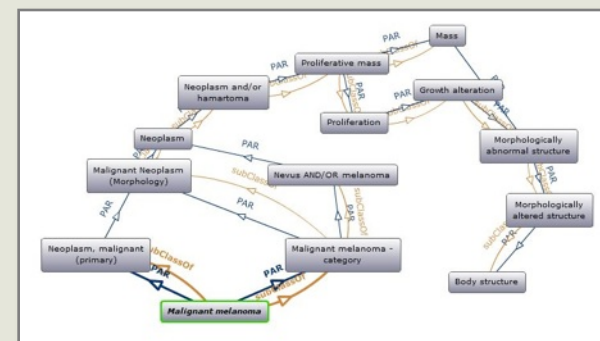
Term recognition

Data Access



Search “data”
annotated with a
given term

<http://bioportal.bioontology.org>

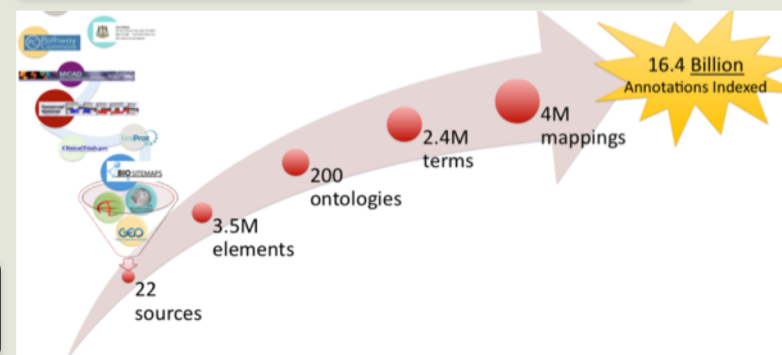


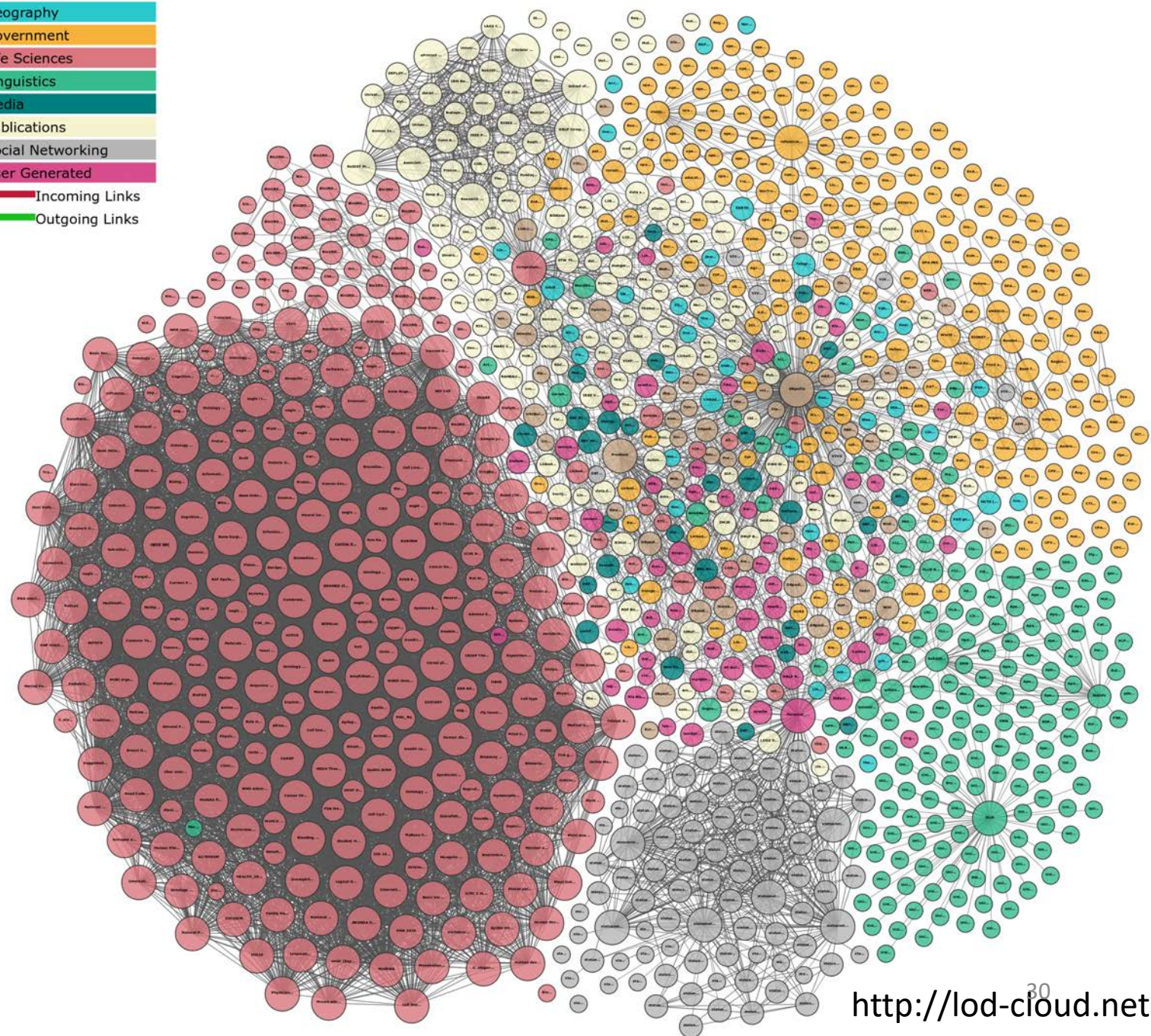
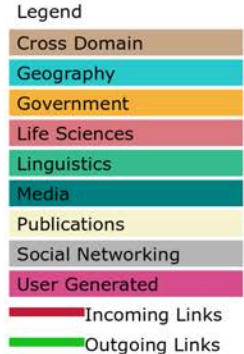
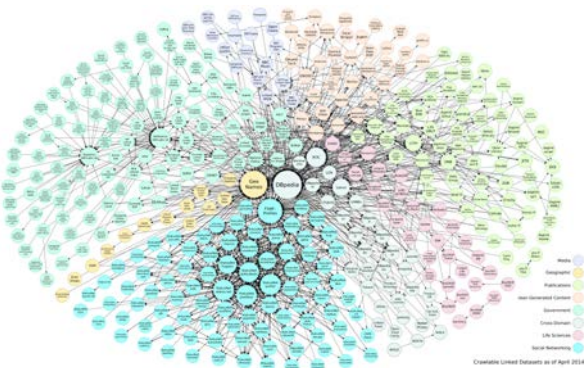
Jump To:

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





NCBO BioPortal
data as of 2013

Who has been reusing NCBO technology so far?

- NCI term browser (BioPortal first, then LexEVS)
(<https://nciterns.nci.nih.gov>)
- Open Ontology Repository (OOR) Initiative
(<http://www.oor.net>)
- Marine Metadata Interoperability Ontology Registry and Repository
(<http://mmisw.org>)
- Earth Science Information Partners ESIPPortal (then ORR)
<http://semanticportal.esipfed.org>
- AgroPortal
<http://agroportal.lirmm.fr>
- SIFR/French BioPortal
<http://bioportal.lirmm.fr>
- Stanford libraries
<https://biblio.ontportal.org>
- LifeWatch ERIC EcoPortal
<http://ecoportal.lifewatchitaly.eu/>
- Chinese Academy of Medical Sciences
<http://medportal.bmicc.cn>
- And a many hospitals, research labs, with private data and specific needs (often in-house annotation)



What are the ontology libraries out there?

- Ontology repositories / portal

- [NCBO BioPortal](#)

- [Ontobee](#)

- [AberOWL](#)

- [EBI Ontology Lookup Service](#)

- OKFN Linked Open Vocabularies

- ONKI Ontology Library Service

- MMI Ontology Registry and Repository

- ESIPportal

- AgroPortal

- [SIFR BioPortal](#)

- [MedPortal](#)

- EcoPortal

- [CISMEF HeTOP](#)

- [OntoHub](#)

- [Ontoserver](#)

- Web indexes

- Watson, Swoogle, Sindice, Falcons

- Ontology libraries / listings (more or less updated)

- [OBO Foundry](#)

- WebProtégé

- Romulus

- DAML ontology library

- Colore

- FAO VEST Registry

- [FAIRsharing](#)

- DERI Vocabularies , OntologyDesignPatterns, Semanticweb.org, W3C Good ontologies

- BARTOC

- Platform technology, Terminology Services

- Mondeca ITM, LexEVS, ANDS, SKOSMOS, NERC-VS

- Abandoned projects

- Cubboard, Knoodl, Schemapedia, SchemaWeb, OntoSelect, OntoSearch, TONES



28 ontologies/terminologies

- From the UMLS or CISMef's HeTOP or uploaded by users
- Cleaned and checked for annotation

The screenshot shows the SIFR BioPortal interface. At the top, there's a navigation bar with links like Browse, Search, Mappings, etc. The main section is titled 'Browse' and contains a list of 28 ontologies/terminologies. Each entry includes a title, a brief description, and statistics for projects and classes. For example, 'Dictionnaire médical pour les activités réglementaires en matière de médicaments (MDRFRE)' has 1 project and 68,980 classes. Other entries include 'Classification Internationale des Maladies - 10ème révision (CIM-10)', 'Medical Subject Headings, version française (MSHFRE)', 'Systematized Nomenclature of Medicine, version française (SNMFRE)', 'Ontologie des urgences (ONTOLURGENCE)', 'Classification Internationale des Soins Primaires, deuxième édition (CISP-2)', 'Classification ATC (anatomique, thérapeutique et chimique) (ATCFRE)', 'Biologie Hors Nomenclature (BHN)', and 'Ontologie des maladies rares humaines (HRDO)'.

The screenshot shows the AgroPortal interface. At the top, there's a navigation bar with links like Browse, Search, Mappings, etc. The main section is titled 'Browse' and contains a list of 107 ontologies/terminologies. Each entry includes a title, a brief description, and statistics for projects and classes. For example, 'AGROVOC (AGROVOC)' has 681,570 concepts. Other entries include 'AnaEE Thesaurus (ANAETHES)', 'National Agricultural Library Thesaurus (NALT)', 'OntoBiotope (ONTOBIOTOPE)', 'Protein Ontology (PR)', 'IBP Crop Research Ontology (CO_715)', 'Process and Observation Ontology (PO2)', and 'IBP Wheat Trait Ontology (CO_321)'.

► 107 ontologies, 80 candidates

► 5 driving use cases, ~90 registered users



C. Jonquet, A. Annane, K. Bouarech, V. Emonet & S. Melzi. **SIFR BioPortal: French biomedical ontologies and terminologies available for semantic annotation**, In *16th Journées Francophones d'Informatique Médicale, JFIM'16*. Genève, Suisse, July 2016.

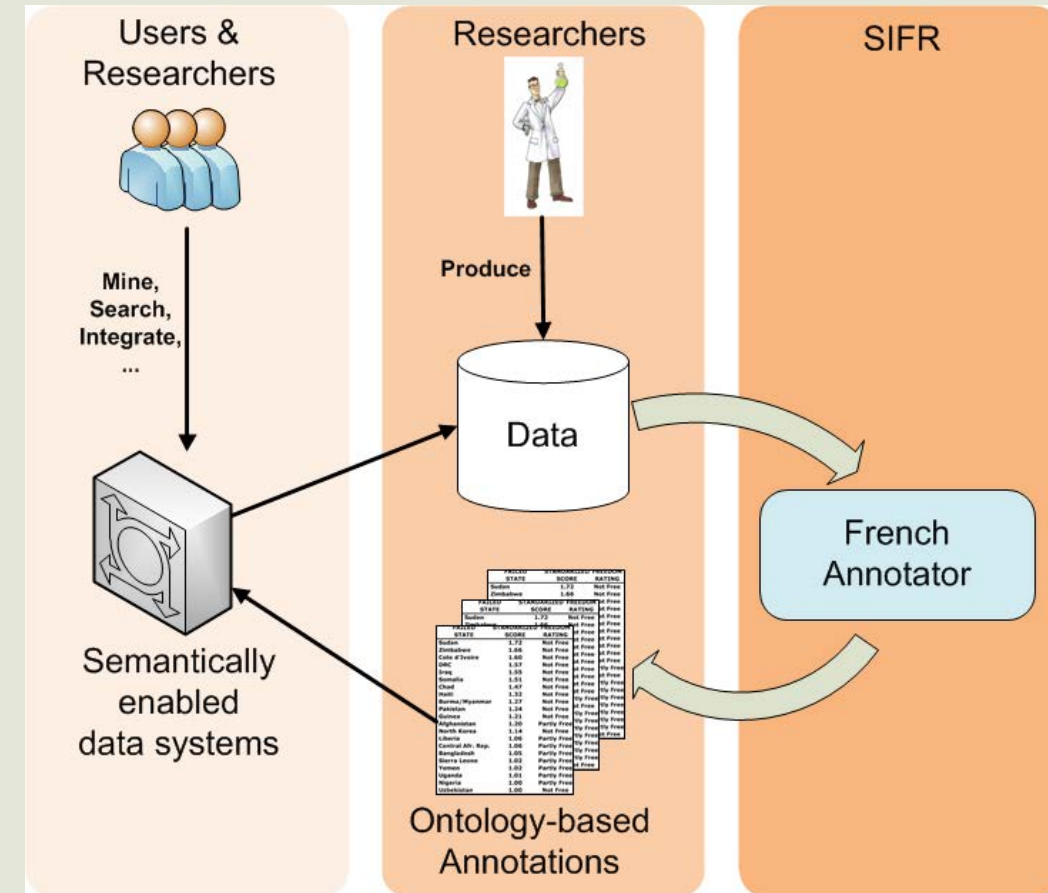


C. Jonquet, A. Toulet, (...) P. Larmande. **AgroPortal: an ontology repository for agronomy**, *Computers and Electronics in Agriculture*. Jan 2018. 144, pp.126-143. Elsevier.

SIFR: Semantic Indexing of French Biomedical Data Resources

<http://www.lirmm.fr/sifr>

- Ontology-based services to index, mine and retrieve French biomedical data
- In France, there is already a reference repository for medical terminologies but nothing public for annotation
- Crucial need for tools & services for French biomedical data



Medical Subject Headings, version française

[Summary](#) [Classes](#) [Properties](#) [Notes](#) [Mappings](#) [Widgets](#)

Details

ACRONYM	MSHFRE
VISIBILITY	Public
DESCRIPTION	Le MeSH (Medical Subject Headings) est le thésaurus de référence dans le domaine biomédical. La NLM (U.S. National Library of Medicine), qui l'a construit et le met à jour chaque année, l'utilise pour indexer et permettre d'interroger ses bases de données, notamment MEDLINE/PubMed. L'Inserm, qui est le partenaire français de la NLM depuis 1969, a traduit le MeSH en 1986, et met à jour la version française chaque année depuis lors. Dans le cadre d'un accord de coopération avec l'Inserm, l'Inist-CNRS (Institut de l'information scientifique et technique du CNRS) contribue à la mise à jour de la version française depuis 2004.
STATUS	Production
FORMAT	UMLS
CONTACT	Yannick Piatte, yannick.piatte@inserm.fr Claudie Hasenfuss, hasenfuss@vjf.inserm.fr
HOME PAGE	http://mesh.inserm.fr/mesh/
PUBLICATIONS PAGE	https://www.nlm.nih.gov/
DOCUMENTATION PAGE	http://mesh.inserm.fr/mesh/
CATEGORIES	Traduction français
GROUPS	French Unified Medical L

Additional Metadata

NATURAL LANGUAGE	
VERSION	2016AB
RELEASE DATE	2016-12-11T00:00:00+00
KNOWN USAGE	La version bilingue est so bases de données en fran
FUNDED BY	Institut national de la sant
TRANSLATOR	INSERM
HAS DOMAIN	http://data.bioportal.lirmm.fr/
HAS FORMALITY LEVEL	http://w3id.org/nikos/nkos
HAS LICENSE	Contactez l'INSERM
ONTOLOGY SYNTAX	http://www.w3.org/ns/fo
IS OF TYPE	http://omv.ontoware.org/2
HAS PRIOR VERSION	MSHFRE/submissions/
DEPRECATED	false
PUBLISHER	INSERM
IDENTIFIER	
IS FORMAT OF	https://www.nlm.nih.gov/
ENDPOINT	

[Go to the REST API JSON entry](#)

Get my metadata back

[N-Triples](#) [Json-LD](#) [RDF/XML](#)

Metrics

NUMBER OF CLASSES:	27879
NUMBER OF INDIVIDUALS:	0
NUMBER OF PROPERTIES:	6
MAXIMUM DEPTH:	15
MAXIMUM NUMBER OF CHILDREN:	164
AVERAGE NUMBER OF CHILDREN:	4

Browse

Access all ontologies that are available in SIFR BioPortal: 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 SIFR BioPortal 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 SIFR BioPortal using the Submit New Ontology link (you need to [login](#) to see this link).

Search... Showing 28 of 29 Sort: Popular

[Submit New Ontology](#)

Entry Type
☒ Ontology View (28)
☐ CBO Model (0)
☐ NLM Value Set (0)

Uploaded in the Last

Category
☒ Traduction français (11)
☐ Uniquement français (0)
☐ Vue français (0)

Group
☒ CISEF (11)
☐ LIMCS (0)
☐ LOTERIE (0)
☐ NCBOBP (0)
☐ UMLS (11)

Format
☒ OWL (21)
☐ SKOS (3)
☐ UMLS (4)

Ontology Content
☒ Notes (4)
☐ Reviews (0)
☐ Projects (16)
☐ Summary Only (0)

Natural Language
☒ German (1)
☐ English (7)
☐ French (28)
☐ Italian (1)
☐ Portuguese (1)
☐ Spanish (1)

Formality Levels
☒ Classification scheme (2)
☐ Dictionary (2)
☐ Gazetteer (0)
☐ Glossary (0)
☐ List (2)
☐ Name authority list (0)
☐ Ontology (8)
☐ Semantic network (0)
☐ Subject heading scheme (0)
☐ Synonym ring (0)
☐ Taxonomy (1)
☐ Terminology (0)
☐ Thesaurus (4)

Is of Type
☒ Application Ontology (0)
☐ Core Ontology (0)
☐ Domain Ontology (3)
☐ Task Ontology (0)

Dictionnaire médical pour les activités réglementaires en matière de médicaments (MDRFRE)
 Traduction française de Medical Dictionary for Regulatory Activities Terminology (MedDRA)
 Uploaded: 3/4/17 [Projects](#) 1 [Classes](#) 68,980

Classification Internationale des Maladies - 10ème révision (CIM-10)
 La CIM-10 permet le codage des maladies, des traumatismes et de l'ensemble des motifs de recours aux services de santé.
 Uploaded: 3/9/17 [Projects](#) 1 [Classes](#) 27,879

Medical Subject Headings, version française (MSHFRE)
 Le MeSH (Medical Subject Headings) est le thésaurus de référence dans le domaine biomédical
 Uploaded: 3/4/17 [Projects](#) 1 [Classes](#) 27,879

Systematized Nomenclature of Medicine, version française (SNMFRE)
 La SNOMED Internationale (Systematized Nomenclature of Medicine) est une nomenclature pluri-axiale couvrant tous les champs de la médecine et de la dentisterie humaines, ainsi que la médecine animale
 Uploaded: 3/16/17 [Projects](#) 1 [Classes](#) 106,291

Ontologie des urgences (ONTOLURGENCE)
 Ontologie des urgences médicales créée durant le projet LERUD.
 Uploaded: 10/27/15 [Projects](#) 1 [Classes](#) 10,031

Classification Internationale des Soins Primaires, deuxième édition (CISP-2)
 La CISP-2 permet de classer et coder trois éléments de la consultation de médecine générale, ou plus généralement de soins primaires
 Uploaded: 3/20/17 [Projects](#) 1 [Classes](#) 745

Classification ATC (anatomique, thérapeutique et chimique) (ATCFRE)
 (from Wikipedia) La classification ATC (anatomique, thérapeutique et chimique) est utilisée pour classer les médicaments
 Uploaded: 3/20/17 [Projects](#) 1 [Classes](#) 5,768

Biologie Hors Nomenclature (BHN)
 L'activité innovante de biologie et d'anatomie-pathologie réalisée notamment dans les Centres Hospitalo-Universitaires est habituellement appelée activité hors nomenclature (BHN pour la biologie hors nomenclature et PHN pour l'anatomie-pathologie hors nomenclature)
 Uploaded: 11/24/15 [Projects](#) 1 [Classes](#) 13,539

Ontologie des maladies rares humaines (HRDO)
 Ontologie des maladies rares établie par lors du projet de recherche OrphaOnto (2010-2012, Limics, INSERM UMR5472) à partir des données d'Orphanet, INSERM U514
 Uploaded: 11/24/15 [Projects](#) 1 [Classes](#) 13,539



A dedicated version of BioPortal for French ontologies

<http://bioportal.lirmm.fr>

28 monolingual ontologies/terminologies

- From the UMLS or HeTOP or uploaded by users
- Cleaned and checked for annotation



C. Jonquet, A. Annane, K. Bouarech, V. Emonet & S. Melzi. **SIFR BioPortal: French biomedical ontologies and terminologies available for semantic annotation**, In *16th Journées Francophones d'Informatique Médicale JFIM'16*. Genève, Suisse, July 2016.

BioPortal

LIRMM

Browse

Search

Mappings

Recommender

Annotator

NCBO Annotator+

Projects

Landscape

Recently Viewed

Sign In

Help

Annotator

The SIFR BioPortal 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 get ontology-based annotations. Hover the mouse pointer on any button to see what it does.

Le mélanome est un cancer de la peau ou des muqueuses, développé aux dépens des mélanocytes (tumeur mélanocytaire).

Son siège initial est la peau dans l'immense majorité des cas. Il existe toutefois des mélanomes de l'œil (mélanome choroïdien), des muqueuses (bouche, canal anal, vagin), et plus rarement encore des organes internes.

Insert sample text

Ontology filters

Select Ontologies

MDRFRE

MSHFRE

clear selection

select from list

Select UMLS Semantic Types

Type here to select UMLS semantic types

Select UMLS Semantic Groups

Maladies (DISO)

Anatomie (ANAT)

Matching parameters

☒ Match Longest Only

☐ Match Partial Words

☐ Include Mappings

☐ Exclude Numbers

☐ Exclude Synonyms

☐ Lemmatize (beta)

Ancestors Level:

None

Include Score:

cvalue

Score threshold:

0

Get Annotations

French/SIFR Annotator

<http://bioportal.lirmm.fr/annotator>

Annotations												
Only results from ontologies with semantic types available are displayed.												
total results 28 (direct 13 / ancestor 15 / mapping 0)												
CLASS	filter	ONTOLOGY	filter	TYPE	filter	UMLS SEM TYPE	CONTEXT	MATCHED CLASS	filter	MATCHED ONTOLOGY	filter	SCORE
Cancer de la peau		Dictionnaire médical pour les activités réglementaires en matière de médicaments		direct			... est un cancer de la peau ou des muqueuses, ...	Cancer de la peau		Dictionnaire médical pour les activités réglementaires en matière de médicaments		19.932
Cancer de la peau		Dictionnaire médical pour les activités réglementaires en matière de médicaments		direct			... est un cancer de la peau ou des muqueuses, ...	Cancer de la peau		Dictionnaire médical pour les activités réglementaires en matière de médicaments		19.932
Maladies de la peau		Medical Subject Headings, version française		ancestor			... est un cancer de la peau ou des muqueuses, ...	Tumeurs cutanées		Medical Subject Headings, version française		19.198
Tumeurs par siège		Medical Subject Headings, version française		ancestor			... est un cancer de la peau ou des muqueuses, ...	Tumeurs cutanées		Medical Subject Headings, version française		19.198
Tumeurs malignes et non précisées de la peau (excl mélanomes)		Dictionnaire médical pour les activités réglementaires en matière de médicaments		ancestor			... est un cancer de la peau ou des muqueuses, ...	Cancer de la peau		Dictionnaire médical pour les activités réglementaires en matière de médicaments		19.198
Tumeurs cutanées		Medical Subject Headings, version française		direct			... est un cancer de la peau ou des muqueuses, ...	Tumeurs cutanées		Medical Subject Headings, version française		18.000
Mélanome		Dictionnaire médical pour les activités réglementaires en matière de médicaments		direct			Le mélanome est un cancer ...	Mélanome		Dictionnaire médical pour les activités réglementaires en matière de médicaments		4.322
Mélanome		Dictionnaire médical pour les activités réglementaires en matière de médicaments		direct			Le mélanome est un cancer de la peau ou des muqueuses, développé aux dépens des mélanocytes (tumeur mélanocytaire). ... de l'œil (mélanome choroïdien), des muqueuses ...	Mélanome		Dictionnaire médical pour les activités réglementaires en matière de médicaments		4.322
Mélanome		Medical Subject Headings, version française		direct			Le mélanome est un cancer ...	Mélanome		Medical Subject Headings, version française		4.322
Mélanome		Medical Subject Headings, version française		direct			Le mélanome est un cancer de la peau ou des muqueuses, développé aux dépens des mélanocytes (tumeur mélanocytaire). ... de l'œil (mélanome choroïdien), des muqueuses ...	Mélanome		Medical Subject Headings, version française		4.322
Tumeurs neuroendocrines		Medical Subject Headings, version française		ancestor			Le mélanome est un cancer ...	Mélanome		Medical Subject Headings, version française		4.200
Naevus et mélanomes		Medical Subject Headings, version française		ancestor			Le mélanome est un cancer ...	Mélanome		Medical Subject Headings, version française		4.200
Tumeurs neuroendocrines		Medical Subject Headings, version française		ancestor			Le mélanome est un cancer de la peau ou des muqueuses, développé aux dépens des mélanocytes (tumeur mélanocytaire). ... de l'œil (mélanome choroïdien), des muqueuses ...	Mélanome		Medical Subject Headings, version française		4.200
Naevus et mélanomes		Medical Subject Headings, version française		ancestor			Le mélanome est un cancer de la peau ou des muqueuses, développé aux dépens des mélanocytes (tumeur mélanocytaire). ... de l'œil (mélanome choroïdien), des muqueuses ...	Mélanome		Medical Subject Headings, version française		4.200
Mélanocytes		Medical Subject Headings, version française		direct			... dépens des mélanocytes (tumeur mélanocytaire). Son siège ...	Mélanocytes		Medical Subject Headings, version française		3.322
Tumeur		Dictionnaire médical pour les activités réglementaires en matière de médicaments		direct			... des mélanocytes (tumeur mélanocytaire). Son siège initial ...	Tumeur		Dictionnaire médical pour les activités réglementaires en matière de médicaments		3.322
Peau		Medical Subject Headings, version française		direct			Le mélanome est un cancer de la peau ou des muqueuses, développé aux dépens des mélanocytes (tumeur mélanocytaire). ... est la peau dans l'immense majorité ...	Peau		Medical Subject Headings, version française		3.322
Bouche		Medical Subject Headings, version française		direct			Le mélanome est un cancer de la peau ou des muqueuses, développé aux dépens des mélanocytes (tumeur mélanocytaire). ... des muqueuses (bouche, canal anal, vagin), ...	Bouche		Medical Subject Headings, version française		3.322

A. Tchechmedjiev, ..., C. Jonquet. Ontology-Based Semantic Annotation of French Biomedical Text and Clinical Notes BMC Bioinformatics, 19:405, 2018.

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**



AgroPortal a vocabulary and ontology repository for agronomy, food, plant sciences & biodiversity

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

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 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 63 of 65 Sort: Popular

Submit New Ontology

Entry Type

- ☒ Ontology (8)
- ☐ Ontology View (2)
- ☐ CMM Model (0)
- ☐ NLM Value Set (0)

Uploaded in the Last

Category

- ☐ Agricultural Research, Techn...
- ☐ Animal Science and Animal P...
- ☐ Breeding and Genetic Impro...
- ☐ Farms and Farming Systems ...
- ☐ Fisheries and Aquaculture (1)
- ☐ Food Security (1)
- ☐ Food and Human Nutrition (6)
- ☐ Forest Science and Forest Pro...
- ☐ Geographical Locations (0)
- ☐ Government, Agricultural Li...
- ☐ Health and Pathology (0)

Group

- ☐ AGRODATA (10)
- ☐ AGROLD (14)
- ☐ CROP (16)
- ☐ LOVINRA (14)
- ☐ OBO-FOUNDRY (17)
- ☐ WHEAT (10)

Format

- ☐ OBO (13)
- ☐ OWL (46)
- ☐ SKOS (0)
- ☐ UMLS (2)

Ontology Content

- ☐ Notes (0)
- ☐ Reviews (0)
- ☐ Projects (17)
- ☐ Summary Only (0)

Natural Language

- ☐ German (1)
- ☐ English (58)
- ☐ French (0)
- ☐ Italian (1)
- ☐ Portuguese (1)
- ☐ Spanish (0)

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: 3/31/17

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: 3/23/17

National Agricultural Library Thesaurus (NALT)

The Thesaurus is an online vocabulary of agricultural terms in English and Spanish and is cooperatively produced by the National Agricultural Library, USDA and the Inter-American Institute for Cooperation on Agriculture as well as other Latin American agricultural institutions belonging to the Agriculture Information and Documentation Service of the Americas (SIDALC)

Uploaded: 4/26/17

OntoBiotope (ONTOBIOTOPE)

OntoBiotope is an ontology of microorganism habitats

Uploaded: 6/12/16

Protein Ontology (PR)

An ontological representation of protein-related entities

Uploaded: 6/30/15

IBP Crop Research Ontology (CO_715)

Describes experimental design, environmental conditions and methods associated with the crop study/experiment/trail and their evaluation.

Uploaded: 6/26/15

Process and Observation Ontology (PO2)

A core ontology for modeling transformation processes and their observations.

Uploaded: 3/29/17

IBP Wheat Trait Ontology (CO_321)

Wheat Ontology

Uploaded: 9/19/16

AgroPortal

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.

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

Search all ontologies

Enter concept, e.g. Melanoma

[Advanced Search](#)

Find an ontology

Enter ontology name, e.g. NCI Thesaurus

[Browse Ontologies >](#)

Links

- [\(API\)](#)
- [SPARQL](#)
- [Stack Overflow](#)
- [GitHub](#)

Ontology Visits (April 2017)

AGROVOC (AGROVOC)	112
AnaEE Thesaurus (ANAEETHES)	95
National Agricultural Library Thesaurus (NALT)	47
OntoBiotope (ONTOBIOTOPE)	39

Latest Notes

[Terms in double \(IBP Wheat Trait Ontology\)](#)
about 2 months ago by jonquet
A bunch of the terms in this branch are in double. Is this normal ?

[Un peu d'histoire \(Banana Anatomy\)](#)
over 1 year ago by antoulet
Inflorescence est un mot d'origine latine qui signifie "fleurer", il est le même en français et e...

[Can measure by mapped to another ontology ? \(Biorefinery\)](#)
over 1 year ago by jonquet
Such as Unit of Measurement ?

[Is spadice a kind of inflorescence for banana? \(Banana Anatomy\)](#)
over 1 year ago by jonquet
Can we consider spadice an appropriate inflorescence for banana?

Latest Mappings

[metabolic pathway \(SIO\) <=> Metabolic Pathway](#)
(<http://www.southgreen.fr/agrold/resource>)
External Mapping 04/06/2017 by larmande

[QTL \(SIO\) <=> QTL](#) (<http://www.southgreen.fr/agrold/resource>)
External Mapping 04/06/2017 by larmande

[EST_match \(SIO\) <=> EST_match](#)
(<http://www.southgreen.fr/agrold/resource>)
External Mapping 04/06/2017 by larmande

[cDNA_match \(SIO\) <=> cDNA_match](#)
(<http://www.southgreen.fr/agrold/resource>)
External Mapping 04/06/2017 by larmande

Slices

- [Crop Ontology Curation Tool \(crop\)](#)
- [INRA Linked Open Vocabularies \(lovinra\)](#)
- [OBO Foundry \(obo-foundry\)](#)
- [The Agronomic Linked Data \(AgroLD\) \(agrold\)](#)
- [Consortium of Agricultural Biological Databases \(agbiodata\)](#)
- [BDA Wheat Data Interoperability working group \(wheat\)](#)
- [Exclusive AgroPortal ontologies \(exclu\)](#)

Supported by

ANR, INRA, CIRAD, LIRMM, CNRS, Bioversity International, SIFR project, IRD, INRA, IRD, CIRAD

With the collaboration of

Powered by NCBO BioPortal

<http://agroportal.lirmm.fr>

- 107 ontologies, 80 candidates
- 5 driving use cases
- ~90 registered users

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.

Current Release: **4.24 (February 2016)**

Issue tracking on [GitHub](#)

Search all ontologies

[Search](#)
[Advanced Search](#)

Find an ontology

[Explore](#)
[Browse Ontologies >](#)

Links



Ontology Visits (July 2017)

AnaEE Thesaurus (ANAEETHES)	95
AGROVOC (AGROVOC)	94
National Agricultural Library Thesaurus (NALT)	41
OntoBiotope (ONTOBIOTOPE)	36
Wheat Trait Ontology (WHEATPHENOTYPE)	27

[More](#)

Statistics ?

Ontologies	64
Classes	1,199,915
Individuals	1,377,548
Projects	32
Users	77

Latest Notes

[Terms in double \(IBP Wheat Trait Ontology\)](#)

5 months ago by jonquet

A bunch of the terms in this branch are in double. Is this normal ?

[Un peu d'histoire \(Banana Anatomy\)](#)

over 1 year ago by antoulet

Inflorescence est un mot d'origine latine qui signifie "fleurir". Il est le même en français et e...

[Can measure by mapped to another ontology ? \(Biorefinery\)](#)

over 1 year ago by jonquet

Such as Unit of Measurement ?

[Is spadice a kind of inflorescence for banana? \(Banana Anatomy\)](#)

over 1 year ago by jonquet

Can we consider spadice an appropriate inflorescence for banana?

Latest Mappings

[zooplankton \(ANAEETHES\) <=> OMIT_0015869](#)

(<http://purl.obolibrary.org/obo/omit.owl>)

External Mapping 04/25/2017 by jonquet

[QTL \(SO\) <=> QTL \(<http://www.southgreen.fr/agrold/resource>\)](#)

External Mapping 04/06/2017 by larmande

Slices

[Crop Ontology Curation Tool \(crop\)](#)

[INRA Linked Open Vocabularies \(lovinra\)](#)

[OBO Foundry \(obo-foundry\)](#)

[The Agronomic Linked Data \(AgroLD\) \(agrold\)](#)

[Consortium of Agricultural Biological Databases \(agbiodata\)](#)

[RDA Wheat Data Interoperability working group \(wheat\)](#)

[Exclusive AgroPortal ontologies \(exclu\)](#)

With the collaboration of



Supported by



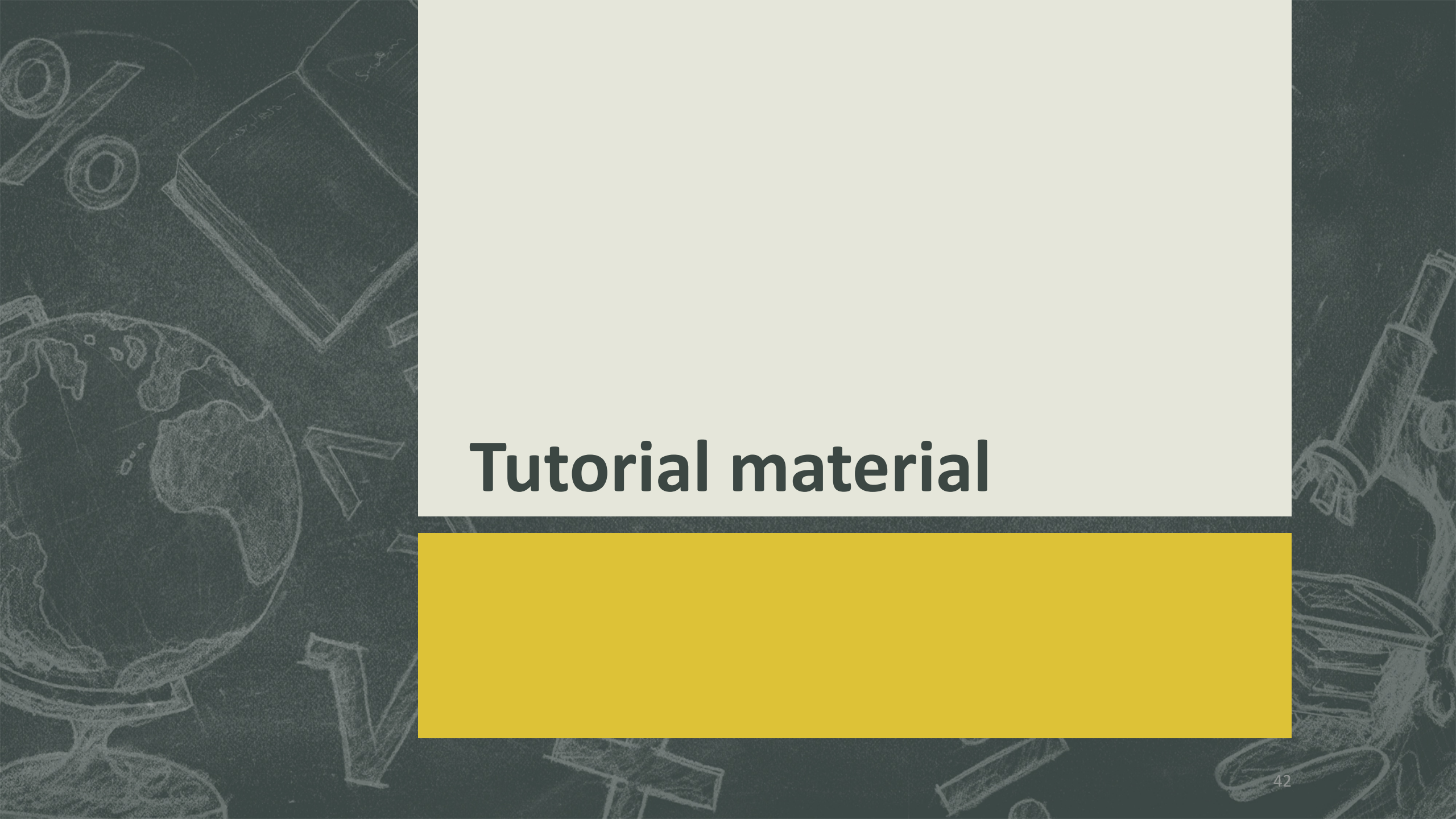
5 Driving Agronomic Use Cases

- 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)



Examples of ontologies uploaded in AgroPortal

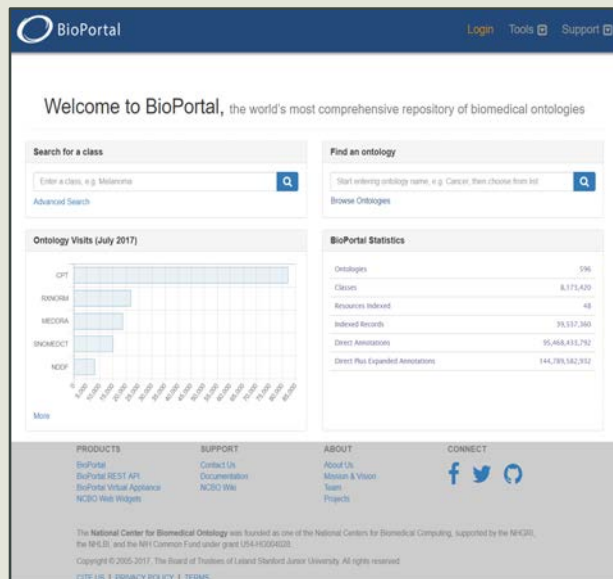
Title	Format	Groups	Size
IBP Rice Trait Ontology (CO_320)	OWL	CROP, RICE	~2K
IBP Wheat Trait Ontology (CO_321)	OWL	CROP, WHEAT	~1K
IBP Wheat Anatomy Ontology (CO_121)	OBO	CROP, WHEAT	~80
IBP Crop Research (CO_715)	OBO	CROP	~250
Multi-Crop Passport Ontology (CO_020)	OBO	CROP	~90
Biorefinery (BIOREFINERY)	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	41 ~585K

A dark grey background featuring a collage of white, chalk-like sketches of various educational and scientific icons. These include a globe, a microscope, a book, a test tube, a compass, a ruler, a pencil, a lightbulb, and a satellite. The sketches are scattered across the background, with some appearing more prominent than others.

Tutorial material

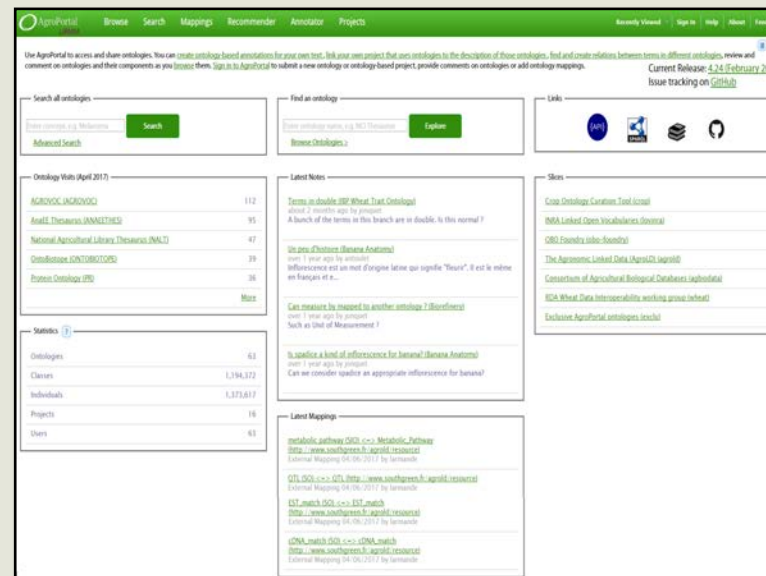
Use of NCBO BioPortal or another instance of the technology

NCBO BioPortal



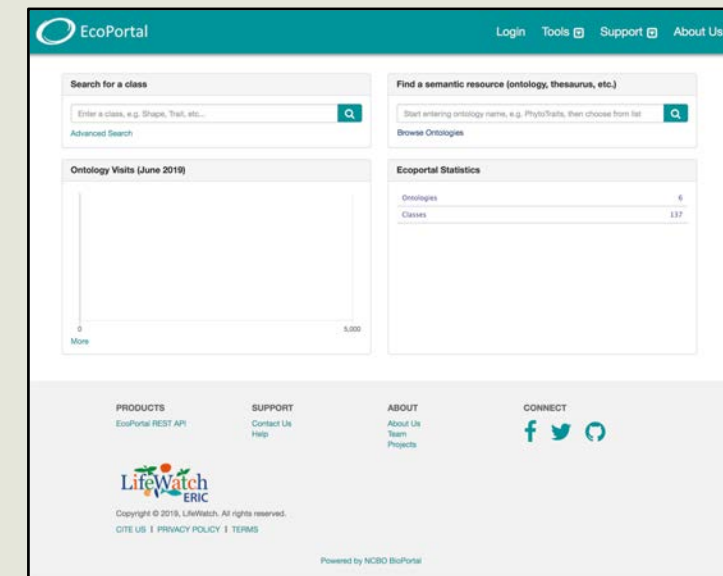
<http://bioportal.bioontology.org>

AgroPortal



<http://agroportal.lirmm.fr>

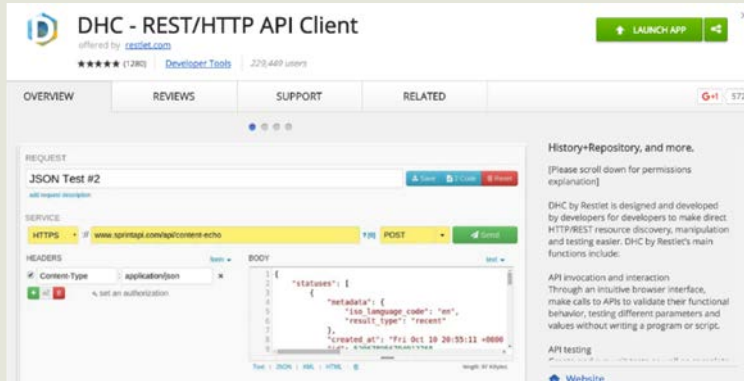
EcoPortal



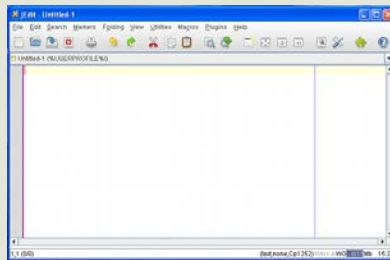
<http://ecoportal.lifewatchitaly.eu/>



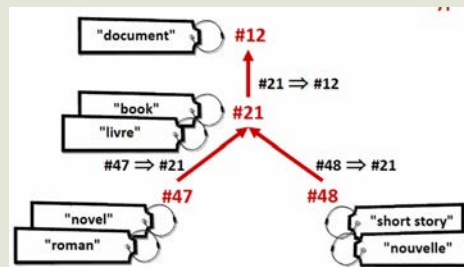
➔ A web browser to use the web application



➔ A REST client for advanced REST web service calls (DHC, cURL, etc.)



➔ A text editor



➔ One ontology (preferably in OWL or SKOS)

During the tutorial



Demo



Exercise

Ressources

- Examples will be given with AgroPortal but (most of the time) equivalent action or queries can be done on one of the other portal.
- For API, by changing the base URL
 - <http://data.agroportal.lirmm.fr/>
 - <http://data.bioontology.org/>
 - <http://193.204.79.110:8080> (for EcoPortal)
- Documentation
 - AgroPortal: <https://github.com/agroportal/documentation/wiki/>
 - NCBO BioPortal: NCBO wiki

Create an account and get an APIkey

- Sign in > Create account
- Copy/paste your APIKey somewhere

that uses ontologies to the description of those ontologies, find and create relations between terms in different ontologies, review
y-based project, provide comments on ontologies or add ontology mappings.

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

Sign In | Help | Feedback

Explore

Search resources

Enter a concept, e.g. Melanoma

Search

[Advanced Resource Search](#)

Latest Mappings

[Season \(CO_715\) <=> Season \(http://dbpedia.org\)](#)
External Mapping 01/08/2016 by jonquet

[Season \(CO_715\) <=> ccon#Season \(http://data.bioontology.org/ontologies/CCON\)](#)
Interportal Mapping ncbo 01/08/2016 by jonquet

[plant organ \(PO\) <=> Plant_organ \(http://dbpedia.org/ontology/\)](#)
External Mapping 11/30/2015 by jonquet

[Plant \(STY\) <=> Plant \(http://dbpedia.org/ontology\)](#)
External Mapping 11/06/2015 by jonquet

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

Slices

[Crop Ontology Curation Tool \(crop\)](#)

[INRA Linked Open Vocabularies \(lovinra\)](#)

[The Agronomic Linked Data \(AgroLD\) \(agrolD\)](#)

[RDA Wheat Data Interoperability working group \(wheat\)](#)

[Exclusive AgroPortal ontologies \(exclu\)](#)

ported by

Libra NOMEV

collaboration of

rs

Biodiversity International

INRA

IRD

Institut de recherche pour le développement

cirad

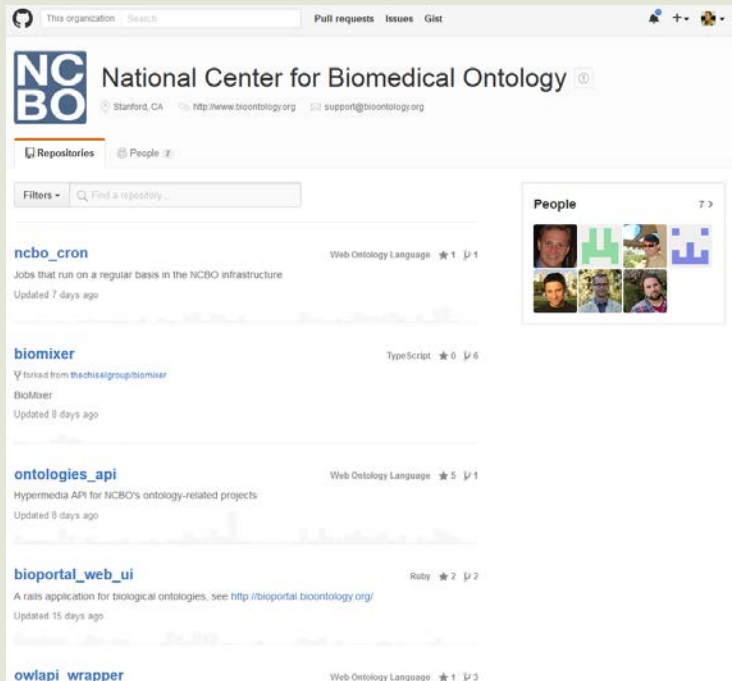
INRA

IRD

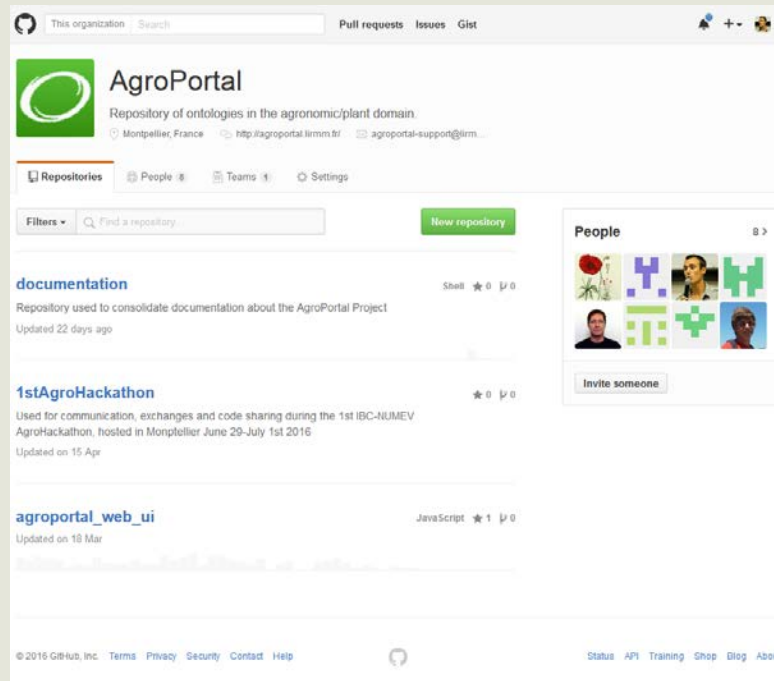
Institut de recherche pour le développement

cirad

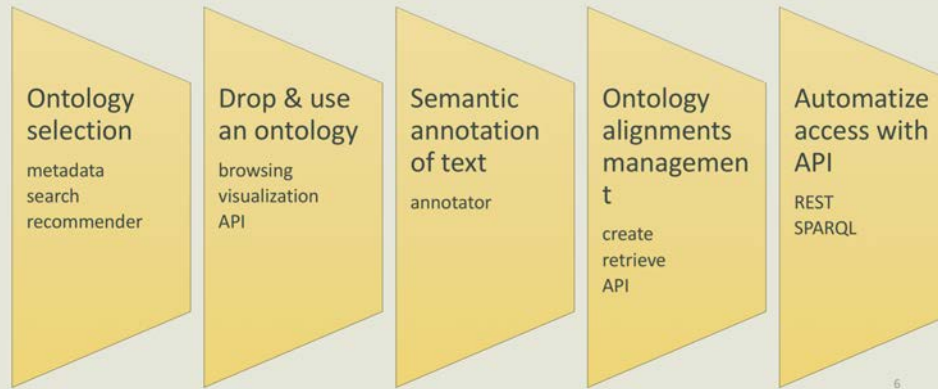
For those who would like to see the code a little closer



<https://github.com/ncbo>



<https://github.com/agroportal>



1. Ontology selection

- Use metadata
- Search within an ontology
- Use the Recommender
- Define metadata for your ontology

Why ontology selection and evaluation is hard?

- Large **number and variety** of ontologies (versions, platforms, formats, etc.), different **complexity level** (from terminology to ontologies)
- **Automation** of the selection process?
- Diversity of **user requirements** and expectations
 - Pick up an ontology for reuse in a knowledge based system
 - Ontology extension
 - Automatic substitution of an ontology by another one
- What's the **risk of a bad choice**?
 - Miss a relevant ontology
 - Miss connection/integration with other data that use the right ontologies
 - Miss possible reuse and start a new ontology

←→agroportal.lirmm.fr/ontologies

Rechercher

☆📅🔒⬇️🏠📶🗨️📧🌱

AgroPortalLIRMM

BrowseSearchMappingsRecommenderAnnotatorProjects

Recently ViewedSign InHelpFeedback

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).

Submit New Ontology

Entry Type

☒ Ontology (37)
☐ 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 (3)
☐ 500-699 Structural and Functio...
☐ 700-799 Location and Environ...
☐ Crop Ontology (7)
☐ Reference ontologies for plant...

Group

☐ CROP (4)
☐ LOVINRA (2)
☐ RICE (8)
☐ WHEAT (22)

Format

☐ OBO (22)
☐ OWL (13)
☐ UMLS (2)

Search...

Showing 37 of 37 Sort: Popular

Biorefinery (BIOREFINERY)

This vocabulary describes characteristics of biomass relevant for bio-refinery and unitary operations to transform a biomass in glucose.

Uploaded: 10/24/15

notes1projects1classes284

Plant Trait Ontology (PTO)

A controlled vocabulary to describe phenotypic traits in plants

Uploaded: 6/23/15

projects1classes1,337

IBP Rice Trait Ontology (CO_320)

CGIAR rice trait ontology version 3

Uploaded: 6/26/15

classes488

Wheat Trait Ontology (WHEATPHENOTYPE)

WheatPhenotype is an ontology of wheat traits and environmental factors that affect these traits

Uploaded: 7/1/15

classes466

Banana Anatomy (CO_125)

Ontology of the Banana Anatomy

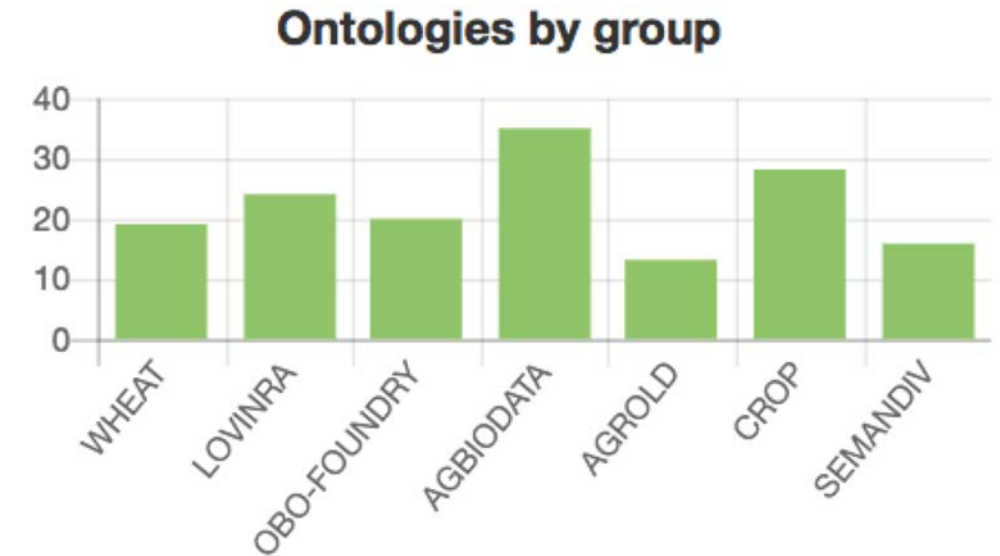
Uploaded: 6/24/15

notes2classes150



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://lovinra.agroportal.lirmm.fr/>

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

Your turn!



Select an
ontology by
browsing or
searching

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@inra.fr
HOME PAGE	http://lovinra.inra.fr/
PUBLICATIONS PAGE	https://doi.org/10.1186/1471-2105-16-S10-S1
DOCUMENTATION PAGE	http://lovinra.inra.fr/
CATEGORIES	Biodiversity and Ecology, Natural Resources, Earth and Environment
GROUPS	GDR SemanDiv, INRA Linked Open Vocabularies

Additional Metadata

URI	http://purl.obolibrary.org/obo/TEMP
NATURAL LANGUAGE	
VERSION	1.2
RELEASE DATE	2018-07-24T18:02:31+02:00

Go to the REST API JSON entry

Get my metadata back

- N-Triple
- Json-LD
- RDF/XML

Metrics ?

NUMBER OF CLASSES:	2320
NUMBER OF INDIVIDUALS:	0
NUMBER OF PROPERTIES:	0
MAXIMUM DEPTH:	13
MAXIMUM 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

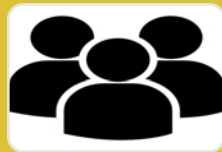


So much things to say about an ontology



Intrinsic

- names, acronym, language, ids, version, status, license, syntaxe, type, guidelines



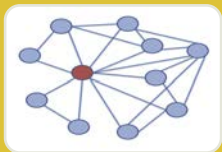
People

- creator, contributor, publisher, contact, curator



Grouping

- domain, group



Relation

- imports, versions, views, related to, aligned to, used by, translation, generalization, specialization



Content

- key classes, dumps, partitions, example, changes



Community

- endorsments, reviews, notes, projects, analytics, support, audience



Date

- creation, modification, released, validation



Metrics

- classes, properties, individuals, depth, etc.



Provenance

- Source, generated by, invalidated by



Description

- documentation, abstract, reference, notes, methods, tools, logo, property used, homepage

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 web interface. The top navigation bar includes links for Browse, Search, Mappings, Recommender, Annotator, Projects, and Landscape. The main content area is divided into several sections:

- Details:** A table providing basic information about the ontology, including its name (ONTOBIOTOPE), visibility (Public), description, status (Production), format (OBO), contact (Claire Nédélec), home page, publication page, documentation page, categories (Natural Resources, Earth and Environment), and groups (INRA Linked Open Vocabularies).
- Additional Metadata:** A table providing more detailed information, including natural language (English), 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), notes, creators (Claire Nédélec), designed for ontology task, endorsed by (INRA), funded by (INRA), has formality level, has license (CC-BY-ND), ontology syntax, is of type, publisher (INRA), identifier (doi.org/10.15454/1.4382640528105164E12), and copyright holder (INRA).
- Metrics:** A table showing various metrics such as number of classes (2320), number of individuals (0), number of properties (0), maximum depth (13), maximum number of children (42), average number of children (3), classes with a single child (240), classes with more than 25 children (3), and classes with no definition (2320).
- Visits:** A line graph showing the number of visits over time, with a peak in late 2016 and a decline in early 2017.
- Reviews:** A section indicating that no reviews are available.
- Submissions:** A table showing the submission history, including the submission name, release date, upload date, and download links.
- Views:** A section indicating that no views are available.
- Projects Using This Ontology:** A table showing the projects that use the ontology, including the project name, description, people, and institution.

Red boxes highlight specific features: the "Go to the REST API JSON only" button and the "Get my metadata back" buttons (N-Triples, JSON-LD, RDF/XML) in the top right; and the "Additional Metadata" table in the middle left.

Browse and select ontologies

- Allows to search, order and select ontologies using a **facetted search** approach, based on the metadata
- 4 additional ways to filter ontologies in the list
- 2 new options to sort this list (name, released date).

The screenshot displays the 'Browse' page of the AgroPortal. The page features a green header with navigation links: Browse, Search, Mappings, Recommender, Annotator, Projects, Recently Viewed, Sign In, Help, About, and Feedback. Below the header, a search bar is present, and a note states: '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 by 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).' The main content area lists several ontologies, each with a brief description and upload date. The ontologies listed are: AGROVOC (AGROVOC), National Agricultural Library Thesaurus (NALT), AnaEE Thesaurus (ANAETHES), IBP Wheat Trait Ontology (CO_321), Plant Ontology (PO), Wheat Trait Ontology (WHEATPHENOTYPE), IBP Crop Research Ontology (CO_715), OntoBiotope (ONTOBIOTOPE), Protein Ontology (PR), Plant Trait Ontology (TO), Experimental Factor Ontology (EFO), and Phenotypic Quality Ontology (PATO). Each ontology entry includes a 'concepts' or 'projects' count and a 'classes' count. On the left side, there are several filter sections: 'Entry Type' (Ontology, Ontology View, CMM Model, NLM Value Set), 'Uploaded in the Last' (dropdown), 'Category' (Agricultural Research, Techn..., Animal Science and Animal P..., Breeding and Genetic Impro..., Farms and Farming Systems..., Fisheries and Aquaculture..., Food Security, Food and Human Nutrition..., Forest Science and Forest Pro..., Geographical Locations, Government, Agricultural La..., Health and Pathology), 'Group' (AGRODATA, AGROLD, CROP, LOVINRA, OBO-FOUNDRY, WHEAT), 'Format' (OBO, OWL, SKOS, UMLS), 'Ontology Content' (Notes, Reviews, Projects, Summary Only), 'Natural Language' (German, English, French, Italian, Portuguese, Spanish), 'Formality Levels' (Classification scheme, Dictionary, Gazetteer, Glossary, List, Name authority list, Ontology, Semantic network, Subject heading scheme, Synonym ring, Taxonomic), and 'Is of Type' (Application Ontology, Core Ontology, Domain Ontology, Task Ontology, Upper Level Ontology, Vocabulary). A red box highlights the 'Natural Language' and 'Formality Levels' sections. Another red box highlights the top right corner of the page, showing the text 'Showing 64 of 66' and a 'Sort' dropdown menu set to 'Popular'.

Showing 64 of 66 Sort: Popular

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: 4/1/17

National Agricultural Library Thesaurus (NALT)
The Thesaurus is an online vocabulary of agricultural terms in English and Spanish and is cooperatively produced by the National Agricultural Library, USDA and the Inter-American Institute for Cooperation on Agriculture as well as other Latin American agricultural institutions belonging to the Agriculture Information and Documentation Service of the Americas (SIDALC).
Uploaded: 4/26/17

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: 3/23/17

IBP Wheat Trait Ontology (CO_321)
Wheat Ontology
Uploaded: 5/24/17

Plant Ontology (PO)
The Plant Ontology is a structured vocabulary and database resource that links plant anatomy, morphology and growth and development to plant genomics data.
Uploaded: 2/3/17

Wheat Trait Ontology (WHEATPHENOTYPE)
WheatPhenotype is an ontology in Obo format that describes the traits of soft wheat (*Triticum aestivum*) and the environmental factors that affect these traits.
Uploaded: 10/9/16

IBP Crop Research Ontology (CO_715)
Describes experimental design, environmental conditions and methods associated with the crop study/experiment/trial and their evaluation.
Uploaded: 6/26/15

OntoBiotope (ONTOBIOTOPE)
Ontobiotope is an ontology of microorganism habitats
Uploaded: 6/12/16

Protein Ontology (PR)
An ontological representation of protein-related entities.
Uploaded: 6/30/15

Plant Trait Ontology (TO)
A controlled vocabulary to describe phenotypic traits in plants
Uploaded: 3/2/17

Experimental Factor Ontology (EFO)
The Experimental Factor Ontology (EFO) provides a systematic description of many experimental variables available in FBI databases, and for external projects such as the NHGRI GWAS catalogue
Uploaded: 5/16/17

Phenotypic Quality Ontology (PATO)
Phenotypic qualities (properties)
Uploaded: 3/22/17

AgroPortal landscape page

► Display “per property”

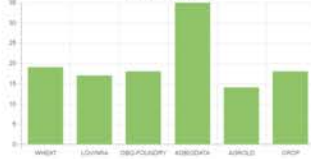
- Explore the agronomical ontology landscape by automatically aggregating the metadata fields of each ontologies in explicit visualizations

AgroPortal Landscape

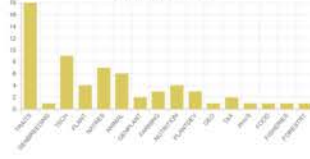
Visualize data retrieved from the ontologies stored in the portal

Groups and categories

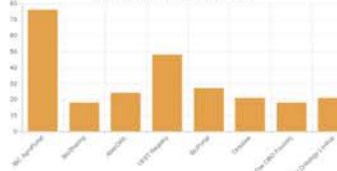
Ontologies by group



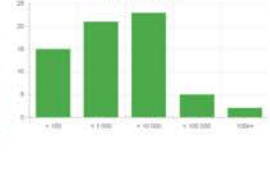
Ontologies by category



Ontologies count in each data catalog



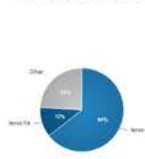
Ontologies by size



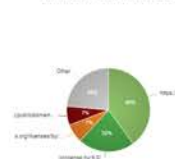
Properties use

The proportion of properties usage among stored ontologies

Ontologies natural languages



Licenses used by the ontologies

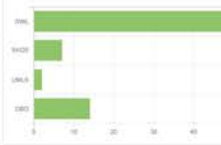


Most used tools to build ontologies

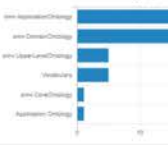


Ontologies types

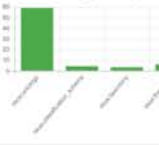
Format used



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



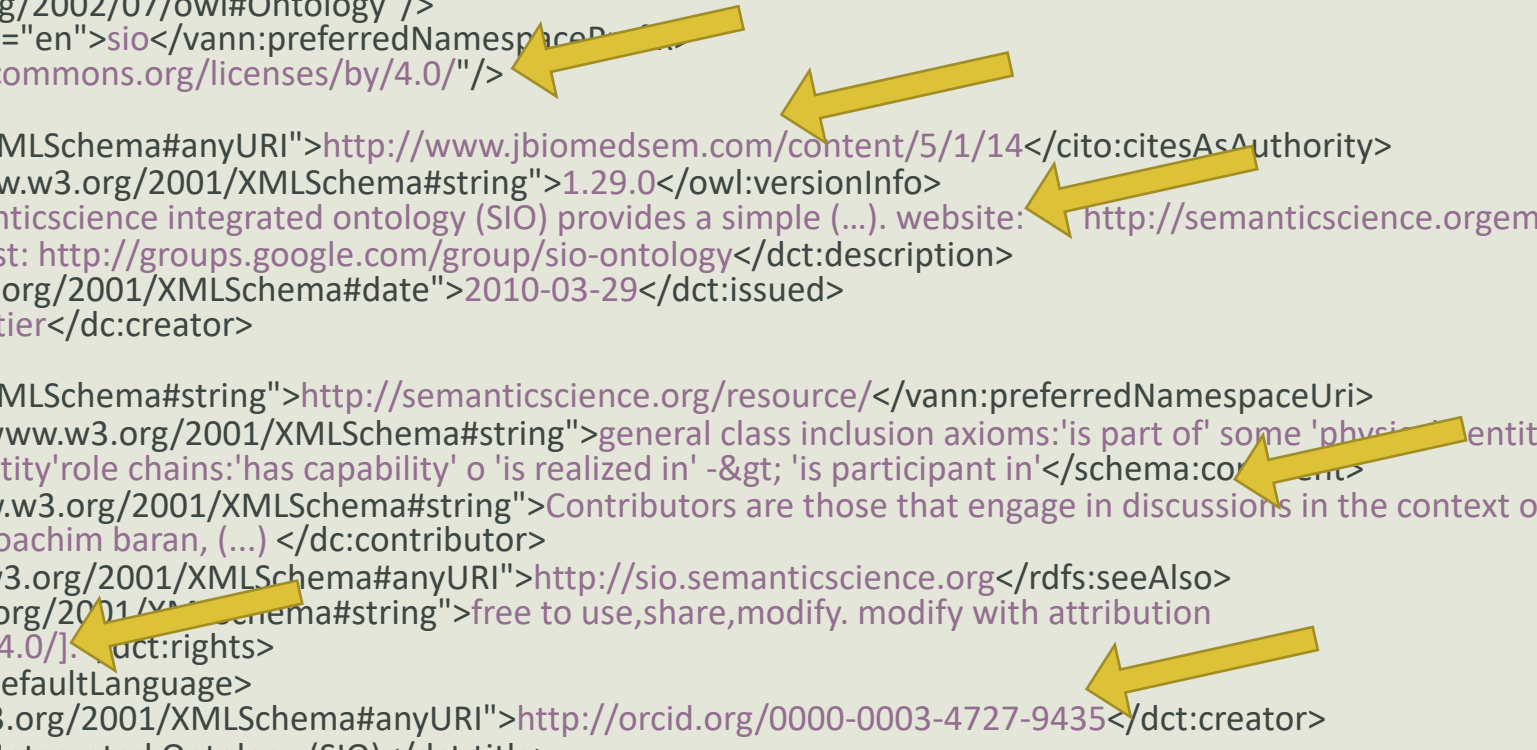
There are many many metadata vocabularies to describe your ontology...

Name Space	Name
rdfs	RDF Schema
omv	Ontology Metadata Vocabulary
owl	OWL 2 Web Ontology Language
dc	Dublin Core Metadata Element Set
dct	DC qualified
foaf	Friend of a Friend Vocabulary
void	Vocabulary of Interlinked Datasets
door	Descriptive Ontology of Ontology Relations
vann	Vocabulary for annotating vocabulary descriptions
adms	Asset Description Metadata Schema
voaf	Vocabulary of a Friend
dcat	Data Catalog Vocabulary
prov	Provenance Ontology
cc	Creative Commons Rights Expression Language
schema	Schema.org
skos	Simple Knowledge Organization System

- <https://github.com/agroportal/documentation/tree/master/metadata>

One example: SIO

```
<rdf:Description rdf:about="http://semanticscience.org/ontology/sio.owl">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Ontology"/>
  <vann:preferredNamespacePrefix xml:lang="en">sio</vann:preferredNamespacePrefix>
  < dct:license rdf:resource="http://creativecommons.org/licenses/by/4.0/" />
  < cito:citesAsAuthority
    rdf:datatype="http://www.w3.org/2001/XMLSchema#anyURI">http://www.jbiomedsem.com/content/5/1/14</cito:citesAsAuthority>
  < owl:versionInfo rdf:datatype="http://www.w3.org/2001/XMLSchema#string">1.29.0</owl:versionInfo>
  < dct:description xml:lang="en">The semanticscience integrated ontology (SIO) provides a simple (...). website: http://semanticscience.org email:
    sio-ontology@googlegroups.com mailing list: http://groups.google.com/group/sio-ontology</dct:description>
  < dct:issued rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2010-03-29</dct:issued>
  < dc:creator xml:lang="en">Michel Dumontier</dc:creator>
  < vann:preferredNamespaceUri
    rdf:datatype="http://www.w3.org/2001/XMLSchema#string">http://semanticscience.org/resource/</vann:preferredNamespaceUri>
  < schema:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string">general class inclusion axioms:'is part of' some 'physical entity'
    subClassOf 'is located in' some 'physical entity' role chains:'has capability' o 'is realized in' -&gt; 'is participant in'</schema:comment>
  < dc:contributor rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Contributors are those that engage in discussions in the context of SIO
    (in alphabetical order):christopher baker, joachim baran, (...) </dc:contributor>
  < rdfs:seeAlso rdf:datatype="http://www.w3.org/2001/XMLSchema#anyURI">http://sio.semanticscience.org</rdfs:seeAlso>
  < dct:rights rdf:datatype="http://www.w3.org/2001/XMLSchema#string">free to use,share,modify. modify with attribution
    [http://creativecommons.org/licenses/by/4.0/].</dct:rights>
  < protege:defaultLanguage> en</protege:defaultLanguage>
  < dct:creator rdf:datatype="http://www.w3.org/2001/XMLSchema#anyURI">http://orcid.org/0000-0003-4727-9435</dct:creator>
  < dct:title xml:lang="en">Semanticscience Integrated Ontology (SIO)</dct:title>
  < dc:identifier> sio.owl</dc:identifier>
  < rdfs:isDefinedBy rdf:resource="http://semanticscience.org/ontology/sio.owl"/>
  < owl:versionIRI rdf:resource="http://semanticscience.org/ontology/sio/v1.29.0/sio-release.owl"/>
  < dct:modified rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2016-05-18</dct:modified>
</rdf:Description>
```



The diagram consists of several yellow arrows pointing from specific XML elements to their corresponding values or descriptions:

- An arrow points from `<vann:preferredNamespacePrefix>` to the value `sio`.
- An arrow points from `< dct:license>` to the URL `http://creativecommons.org/licenses/by/4.0/`.
- An arrow points from `< cito:citesAsAuthority>` to the URL `http://www.jbiomedsem.com/content/5/1/14`.
- An arrow points from `< owl:versionInfo>` to the version number `1.29.0`.
- An arrow points from `< dct:description>` to the description text: "The semanticscience integrated ontology (SIO) provides a simple (...). website: http://semanticscience.org email: sio-ontology@googlegroups.com mailing list: http://groups.google.com/group/sio-ontology".
- An arrow points from `< dct:issued>` to the date `2010-03-29`.
- An arrow points from `< dc:creator>` to the name `Michel Dumontier`.
- An arrow points from `< vann:preferredNamespaceUri>` to the URL `http://semanticscience.org/resource/`.
- An arrow points from `< schema:comment>` to the comment text: "general class inclusion axioms:'is part of' some 'physical entity' subClassOf 'is located in' some 'physical entity' role chains:'has capability' o 'is realized in' -> 'is participant in'".
- An arrow points from `< dc:contributor>` to the list of contributors: "Contributors are those that engage in discussions in the context of SIO (in alphabetical order):christopher baker, joachim baran, (...)".
- An arrow points from `< rdfs:seeAlso>` to the URL `http://sio.semanticscience.org`.
- An arrow points from `< dct:rights>` to the rights text: "free to use,share,modify. modify with attribution [http://creativecommons.org/licenses/by/4.0/].".
- An arrow points from `< protege:defaultLanguage>` to the language `en`.
- An arrow points from `< dct:creator>` to the ORCID ID `http://orcid.org/0000-0003-4727-9435`.
- An arrow points from `< dct:title>` to the title `Semanticscience Integrated Ontology (SIO)`.
- An arrow points from `< dc:identifier>` to the identifier `sio.owl`.
- An arrow points from `< rdfs:isDefinedBy>` to the URL `http://semanticscience.org/ontology/sio.owl`.
- An arrow points from `< owl:versionIRI>` to the URL `http://semanticscience.org/ontology/sio/v1.29.0/sio-release.owl`.
- An arrow points from `< dct:modified>` to the date `2016-05-18`.

Your turn!



Take your ontology and add 3 metadata fields



Tell us what you want to say about your ontology we'll tell you which property to use



Check out Dublin Core, DCAT, Schema.org ...

A scoring algorithm for recommending ontologies

- (1) *coverage*, or the extent to which the ontology covers the input data;
- (2) the *acceptance* of the ontology in the community;
- (3) the level of *detail* of the ontology classes that cover the input data;
- (4) the *specialization* of the ontology to the domain of the input data.

$$\begin{aligned} score(o, t) = & w_c * coverage(o, t) + w_a * acceptance(o) \\ & + w_d * detail(o, t) + w_s * specialization(o, t) \end{aligned}$$

agroportal.lirmm.fr/recommender

Rechercher

AgroPortalLIRMM

BrowseSearchMappingsRecommenderAnnotatorProjects

Recently ViewedtestHelpFeedback

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

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 exerted (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 exerted (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	PATO	61.0	66.0	0.0	64.6	100.0	55	☒
2	PO	24.6	15.8	0.0	87.5	18.6	11	☐
3	EFO	23.4	26.2	0.0	39.0	20.9	20	☐
4	SIO	20.3	26.0	0.0	12.0	28.1	22	☐
5	CO_125	12.2	7.1	0.0	47.1	7.9	6	☐
6	ENVO	12.2	0.6	0.0	77.8	1.0	1	☐
7	PTO	12.1	7.6	0.0	47.1	5.8	2	☐
8	VARIO	11.3	5.9	0.0	47.1	6.7	5	☐
9	GO	10.7	1.2	0.0	66.0	1.2	2	☐
10	CL	10.5	4.7	0.0	49.0	3.8	4	☐
11	CO_321	7.3	2.4	0.0	37.9	1.8	2	☐
12	EDAM	7.2	2.4	0.0	37.3	2.0	2	☐
13	PCO	6.0	2.4	0.0	34.3	2.4	2	☐

Recommender



M. Martinez-Romero, C. Jonquet, M. J. O'Connor, J. Graybeal, A. Pazos & M. A. Musen. **NCBO Ontology Recommender 2.0: An Enhanced Approach for Biomedical Ontology Recommendation**, *Biomedical Semantics*. June 2017. Vol. 8 (21).

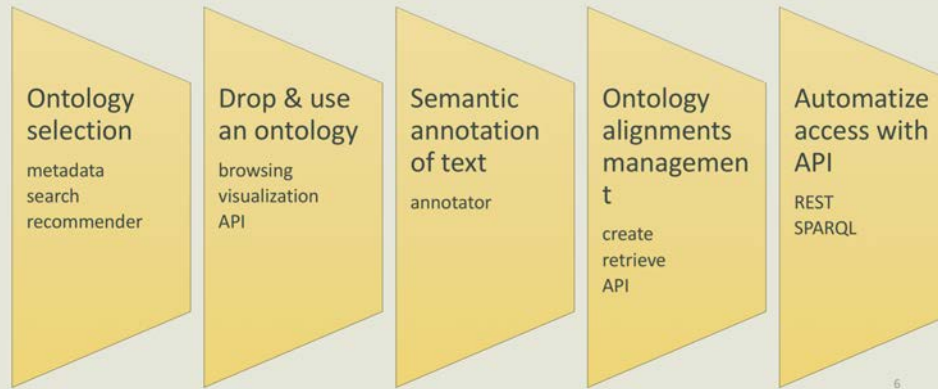
Your turn!



Take the summary of your last article
and get a recommendation for that
content



Enter a list of terms that you would
like to find in an ontology to identify
the one that offers the best coverage



Drop and use an ontology

- Submit an ontology in the repository
- Browse and visualize an ontology
- Access the API for an ontology

Upload an ontology in AgroPortal (1/2)

- 1. Creation of the skeleton

The screenshot shows the 'Submit New Ontology' form in the AgroPortal application. The browser address bar displays 'agroportal.lirmm.fr/ontologies/new'. The page has a green header with the AgroPortal LIRMM logo and navigation links: Browse, Search, Mappings, Recommender, Annotator, Projects, and Admin. A search bar with the placeholder 'Rechercher' is also present. The form itself is titled 'Submit New Ontology' and includes a red note '* fields are required'. It contains several input fields: 'NAME: *', 'ACRONYM: *', 'ADMINISTRATORS: *' (with a 'Select administrators' dropdown), 'VIEWING RESTRICTIONS' (with a 'Public' dropdown), 'CATEGORIES:' (with a 'Select category (domain)' dropdown), and 'VIEW:' (which includes a checkbox for 'This ontology is a view of:' and a dropdown to 'Select an ontology to create a view on'). At the bottom of the form, there is a checkbox for 'Subscribe to email notifications for new notes' and two buttons: 'Cancel' and 'Create ontology'. The footer of the page is green and contains the text 'Powered by NCBO BioPortal Release Notes' and 'NCBO Appliance 2.4'.

agroportal.lirmm.fr/ontologies/new

Rechercher

AgroPortal LIRMM

Browse Search Mappings Recommender Annotator Projects Admin

Submit New Ontology * fields are required

NAME: *

ACRONYM: *

ADMINISTRATORS: *

VIEWING RESTRICTIONS

CATEGORIES:

VIEW: ☐ This ontology is a view of:

☐ Subscribe to email notifications for new notes

Powered by NCBO BioPortal Release Notes

NCBO Appliance 2.4

Upload an ontology in AgroPortal (2/2)

2. Submission description

The screenshot shows the 'Add New Submission' form in AgroPortal, specifically for the OWL format. The form is titled 'Add New Submission' with a red asterisk indicating that fields are required. The 'DESCRIPTION' field is a large text area. The 'FORMAT' dropdown is set to 'OWL'. Below this, there is a section for 'Classes are defined by the rdttype owl:Class' and 'Hierarchical relations between classes are defined by the rdfs:subClassOf property. The root concept of the concept tree is owl:Thing.' This is followed by a table with four rows: 'PREFERRED NAME PROPERTY', 'SYNONYM PROPERTY', 'DEFINITION PROPERTY', and 'AUTHOR PROPERTY'. Each row has a default value and a 'Use default' button. Below the table, there is a section for 'Determining Obsolete Classes' with two methods: '1. Designate a root ID for an obsolete branch.' and '2. Identify a property id that indicates obsolete status. The value must be set to "true".' This is followed by two input fields: '1. ROOT OF OBSOLETE BRANCH (ROOT IS NOT OBSOLETE)' and '2. PROPERTY TO CHECK FOR OBSOLETE STATUS'. The 'VERSION' field is a text input. The 'STATUS' dropdown is set to 'alpha'. The 'RELEASE DATE' field is a date input. The 'LOCATION' section has three radio buttons: 'Metadata Only', 'Load from URL', and 'Upload Local File'. The 'Upload Local File' option is selected. Below this, there is a 'Parcourir...' button and the text 'Aucun fichier sélectionné.' The 'CONTACT' section has 'Name' and 'Email' input fields and an 'Add contact' button. The 'HOME PAGE' field is a text input. The 'DOCUMENTATION PAGE' field is a text input. The 'PUBLICATIONS PAGE' field is a text input. At the bottom right, there is an 'Add submission' button. The footer of the form indicates 'Powered by NCBO BioPortal' and 'NCBO Appliance 2.4'.

Format OWL

The screenshot shows the 'Add New Submission' form in AgroPortal, specifically for the SKOS format. The form is titled 'Add New Submission' with a red asterisk indicating that fields are required. The 'DESCRIPTION' field is a large text area. The 'FORMAT' dropdown is set to 'SKOS'. Below this, there is a section for 'Classes are defined by the rdttype skos:Concept' and 'Hierarchical relations between concepts are defined by the skos:broader property only. The root concept of the concept tree is defined by skos:hasTopConcept.' This is followed by a 'VERSION' field, a 'STATUS' dropdown set to 'alpha', and a 'RELEASE DATE' field. The 'LOCATION' section has three radio buttons: 'Metadata Only', 'Load from URL', and 'Upload Local File'. The 'Upload Local File' option is selected. Below this, there is a 'Parcourir...' button and the text 'Aucun fichier sélectionné.' The 'CONTACT' section has 'Name' and 'Email' input fields and an 'Add contact' button. The 'HOME PAGE' field is a text input. The 'DOCUMENTATION PAGE' field is a text input. The 'PUBLICATIONS PAGE' field is a text input. At the bottom right, there is an 'Add submission' button. The footer of the form indicates 'Powered by NCBO BioPortal' and 'NCBO Appliance 2.4'.

Format SKOS

agroportal.lirmm.fr/ontologies/BIOREFINERY/?p=classes&conceptid=http%3A%2F%2F

Rechercher

AgroPortal
URMM

Browse Search Mappings Recommender Annotator Projects

Recently Viewed Sign In Help Feedback

Biorefinery

Summary Classes Properties Notes Mappings Widgets

Jump To:

- Concept
- Conversion
- Dimension
- Measure
- Prefix
- Quantity
 - Activité enzymatique
 - Arabinose rate
 - Biomass quantity**
 - Buffer concentration
 - Cellulose rate
 - Default quantity result
 - Energie totale du pré-traitement
 - Experience number
 - Glucose rate
 - Humidity Rate
 - Lignin rate
 - Liquid constituent quantity
 - Measured characteristic
 - Numéro d'étape dans le procédé
 - Numéro du cocktail enzymatique
 - Output solid constituent quantity
 - Paramètre de contrôle du procédé
 - Porosité d'une biomasse
 - Quantité de constituant gazeux
 - Quantité de liquide tampon
 - Specific surface
 - Taux d'hémicellulose
 - Taux de Xylose
- Relation
 - Scale
 - Singular_Unit
- Symbolic_Concept
 - Unit_Division_Or_Multiplication
 - Unit_Exponentiation
 - Unit_Multiple_Or_Submultiple

Details	Visualization	Notes (0)	Class Mappings (0)
Preferred Name	Biomass quantity		
ID	http://opendata.inra.fr/resources/BIORAF#biomass_quantity		
prefixIRI	onto:biomass_quantity		
prefLabel	Quantité de biomasse Biomass quantity		
subClassOf	Quantity		

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

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
Computational Biology Institute Home Page	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
Labex Numev Home Page	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
Semantic Indexing of French Biomedical Data Resources Home Page	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](#)



Use an ontology via the API

- Ontology metadata
 - http://data.agroportal.lirmm.fr/ontologies/ONTO/?apikey=**
- Ontology classes
 - http://data.agroportal.lirmm.fr/ontologies/ONTO/classes/?apikey=**

```
..
acronym: "FORM",
name: "Formation",
summaryOnly: null,
ontologyType: http://data.agroportal.lirmm.fr/ontology_types/ONTOLOGY,
@id: http://data.agroportal.lirmm.fr/ontologies/FORM,
@type: http://data.bioontology.org/metadata/Ontology,
- links: {
  submissions: http://data.agroportal.lirmm.fr/ontologies/FORM/submissions,
  properties: http://data.agroportal.lirmm.fr/ontologies/FORM/properties,
  classes: http://data.agroportal.lirmm.fr/ontologies/FORM/classes,
  single_class: http://data.agroportal.lirmm.fr/ontologies/FORM/classes/{class_id},
  roots: http://data.agroportal.lirmm.fr/ontologies/FORM/classes/roots,
  instances: http://data.agroportal.lirmm.fr/ontologies/FORM/instances,
```

- More calls: <http://data.agroportal.lirmm.fr/documentation>

Your turn!



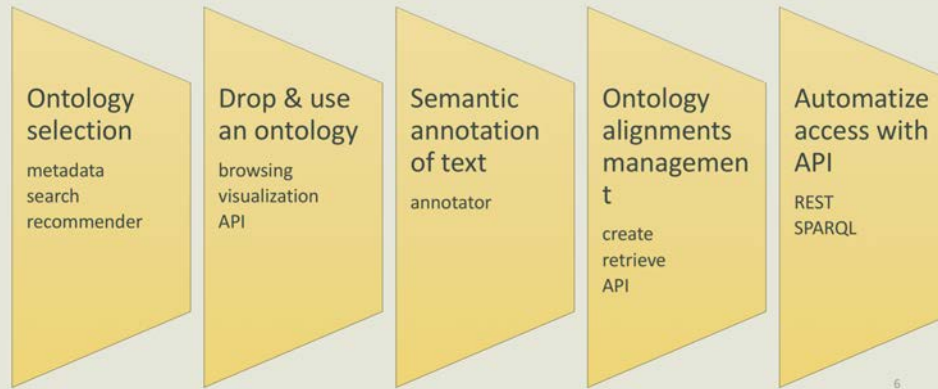
Eventually submit an ontology (if it is not already done) but it is not mandatory



For the ontology of your choice, navigate, visualize, leave some comments



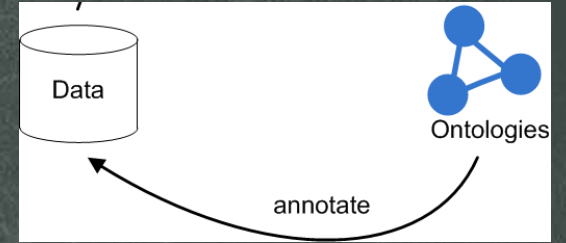
Enter a project that uses one or more ontology (s)



Semantic annotation of text

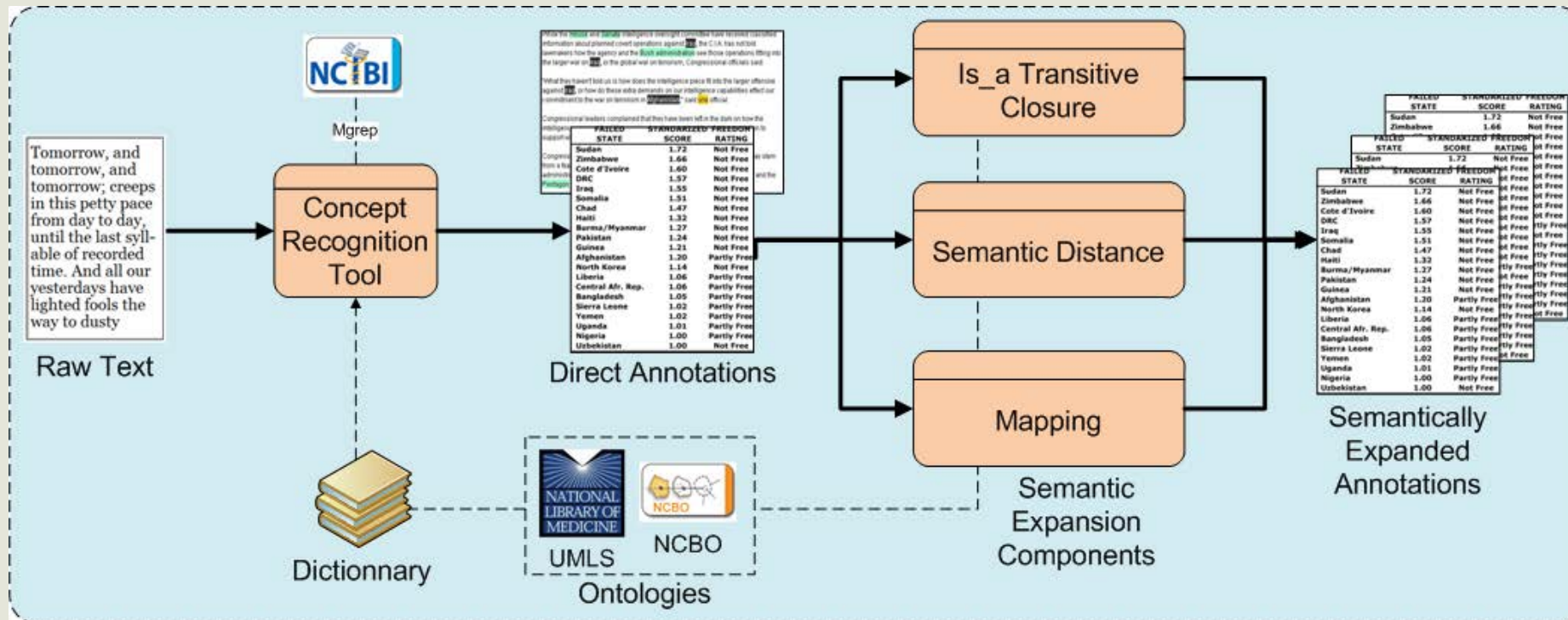
- Identify ontology concepts in text

Why semantic annotation is hard?



- Annotation is not an easy task
 - **Lack of annotation tools** (convenient, simple to use and easily integrated into automatic processes)
 - Boring additional task without immediate reward for the user
- Automatically process a piece of raw text to annotate it with relevant ontologies
 - **Large scale** – to scale up for many resources and ontologies
 - **Automatic** – to offer good precision and recall
 - **Easy to use and to access** – to enlarge the possible use cases
 - **Customizable** – to fit very specific needs
 - **Smart** – to leverage the knowledge contained in ontologies
 - **Evolutionary** – both ontologies and data change everyday

Ontology-based annotation workflow



- First, direct annotations are created by recognizing concepts in raw text,
- Second, annotations are semantically expanded using knowledge of the ontologies,
- Third, all annotations are scored according to the context in which they have been created.

- 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

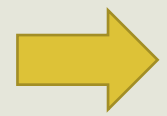
Days to Flower

Fruit set

Fruit Exocarp

Ploidy

Seed oclor



AgroPortal

LIRMM

Browse

Search

Mappings

Annotator

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

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

Plant architecture

Flowers (50%)

Sepal Color

Disc Color



Cassava Trait Ontology

Ontology filters

Select Ontologies

CO_334 x

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



76



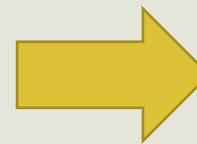
Retrieve the annotations

			these ...
population	Agriculture and Forestry Ontology	direct	... rapidly growing human population , there is a ...
population	Agriculture and Forestry Ontology	direct	... growing human population , there is a ...

Format Results As:

To reproduce these results:

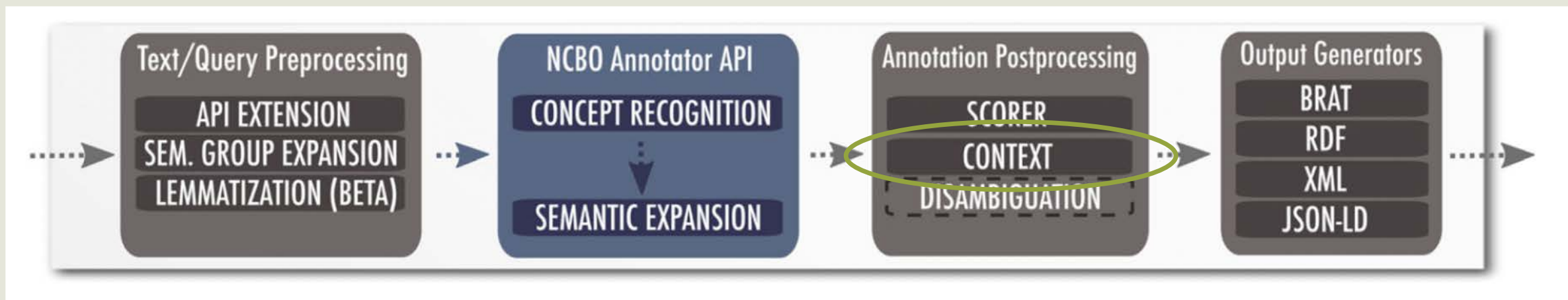
Additional parameters are documented at [Annotator Web Service](#)



```
[
  - {
    - annotatedClass: {
      @id: "http://www.yso.fi/onto/yso/p6881",
      @type: "http://www.w3.org/2002/07/owl#Class"
    },
    hierarchy: [ ],
    - annotations: [
      - {
        from: 11,
        to: 18,
        matchType: "SYN",
        text: "INCREASE",
        negationContext: "AFFIRMED"
      }
    ],
    mappings: [ ],
    score: 3
  },
  - {
    - annotatedClass: {
      @id: "http://lod.nal.usda.gov/nalt/45764",
      @type: "http://www.w3.org/2002/07/owl#Class"
    },
    hierarchy: [ ],
    - annotations: [
      - {
        from: 122,
        to: 126,
        matchType: "SYN",
        text: "HUMAN",
        negationContext: "AFFIRMED"
      }
    ],
    mappings: [ ],
    score: 3
  },
  - {
    - annotatedClass: {
      @id: "http://purl.obolibrary.org/obo/NCBITaxon\_9606",
      @type: "http://www.w3.org/2002/07/owl#Class"
    },
    hierarchy: [ ],
    - annotations: [
      - {
        from: 122,
        to: 126,
        matchType: "SYN",
        text: "HUMAN",
        negationContext: "AFFIRMED"
      }
    ]
  }
]
```



But we did not just “translate” the Annotator



- Most of our new features are developed within a proxy
 - E.g., we can call either the AgroPortal, SIFR BioPortal or even the NCBO BioPortal Annotator and use the same code to score annotations

Improve the workflow to handle clinical text narrative

- Project SIFR & PractiKPharma
- Detecting Negation, Temporality and Experienter
- Implementation using NegEx/ConText
 - Inclusion in the French/SIFR Annotator
 - Proxy architecture to plug this the NCBO Annotator
- Very good performance results
 - e.g., negation F1 between 0.8 and 0.9



A. Abdaoui, A. Tchechmedjiev, W. Digan, S. Bringay, C. Jonquet., French **ConText: a Publicly Accessible System for Detecting Negation, Temporality and Experienter in French Clinical Notes** *Biomedical Informatics*. Under review – 3rd round.

Annotating and contextualizing clinical text

Le patient ne montre aucun signe de fièvre. Son père a déjà eu de l'arthrose. Il a des antécédents de dépression.

Select Ontologies

MSHFRE x

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

Select UMLS Semantic Groups ?

Maladies (DISO) x

☒ Detect negation ?

☒ Detect experierencer ?

☒ Detect temporality ?

CLASS	filter	ONTOLOGY	filter	TYPE	filter	UMLS SEM TYPE	CONTEXT	MATCHED CLASS	filter	MATCHED ONTOLOGY	filter	NEGATION	EXPERIENCER	TEMPORALITY
Fièvre		Medical Subject Headings, version francaise		direct			... signe de fièvre . Son père a ...	Fièvre		Medical Subject Headings, version francaise		NEGATED	PATIENT	RECENT
Arthrose		Medical Subject Headings, version francaise		direct			... eu de l' arthrose . Il a des ...	Arthrose		Medical Subject Headings, version francaise		AFFIRMED	OTHER	RECENT
Dépression		Medical Subject Headings, version francaise		direct			... antécédents de dépression .	Dépression		Medical Subject Headings, version francaise		AFFIRMED	PATIENT	HISTORICAL

Your turn!



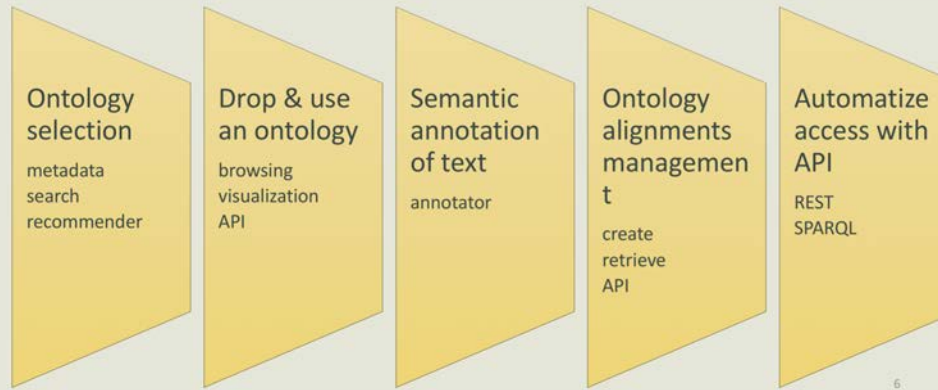
Take a summary of your last article and get annotations



Test the score and other advance parameters



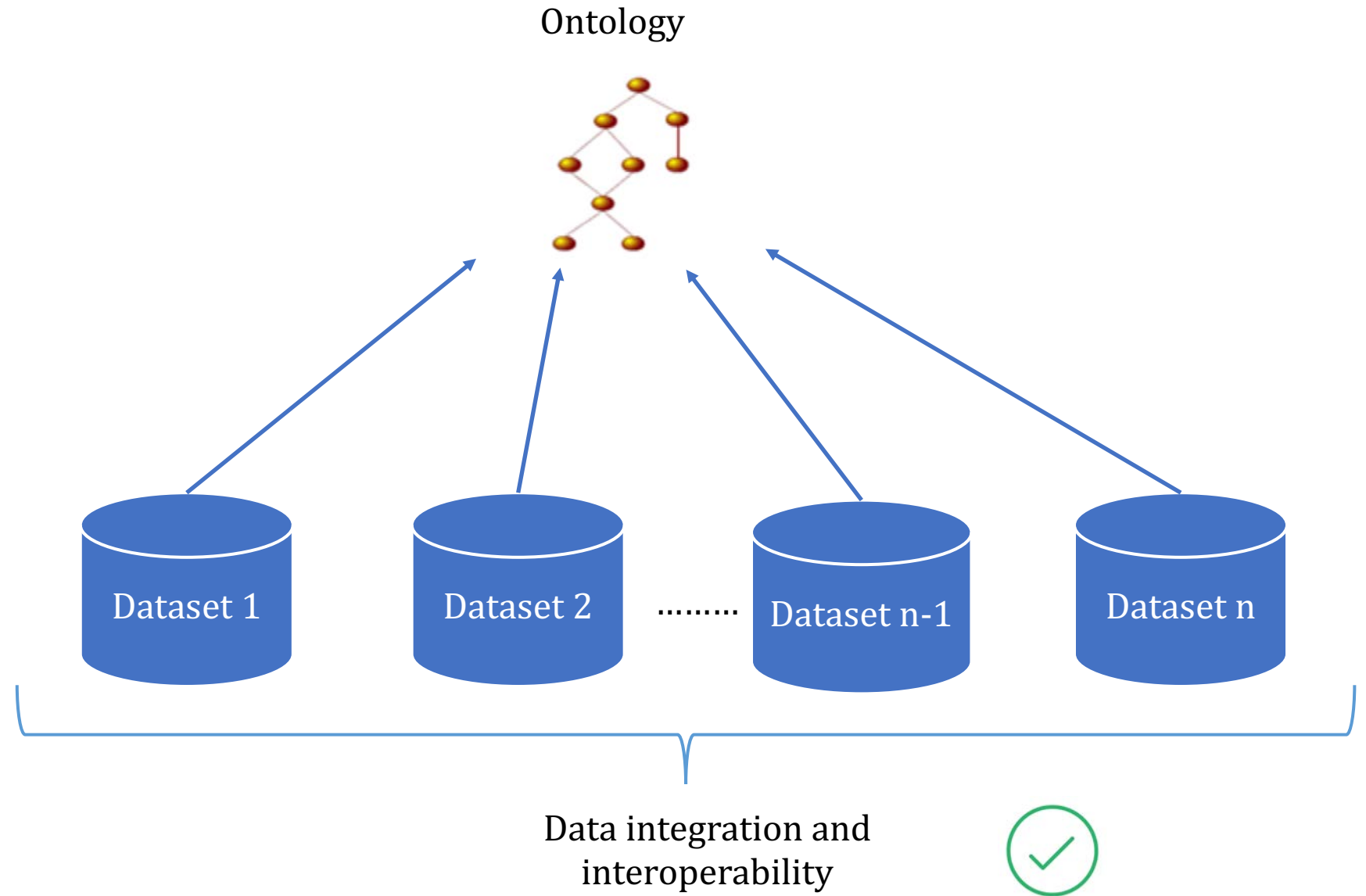
Get same results with the API



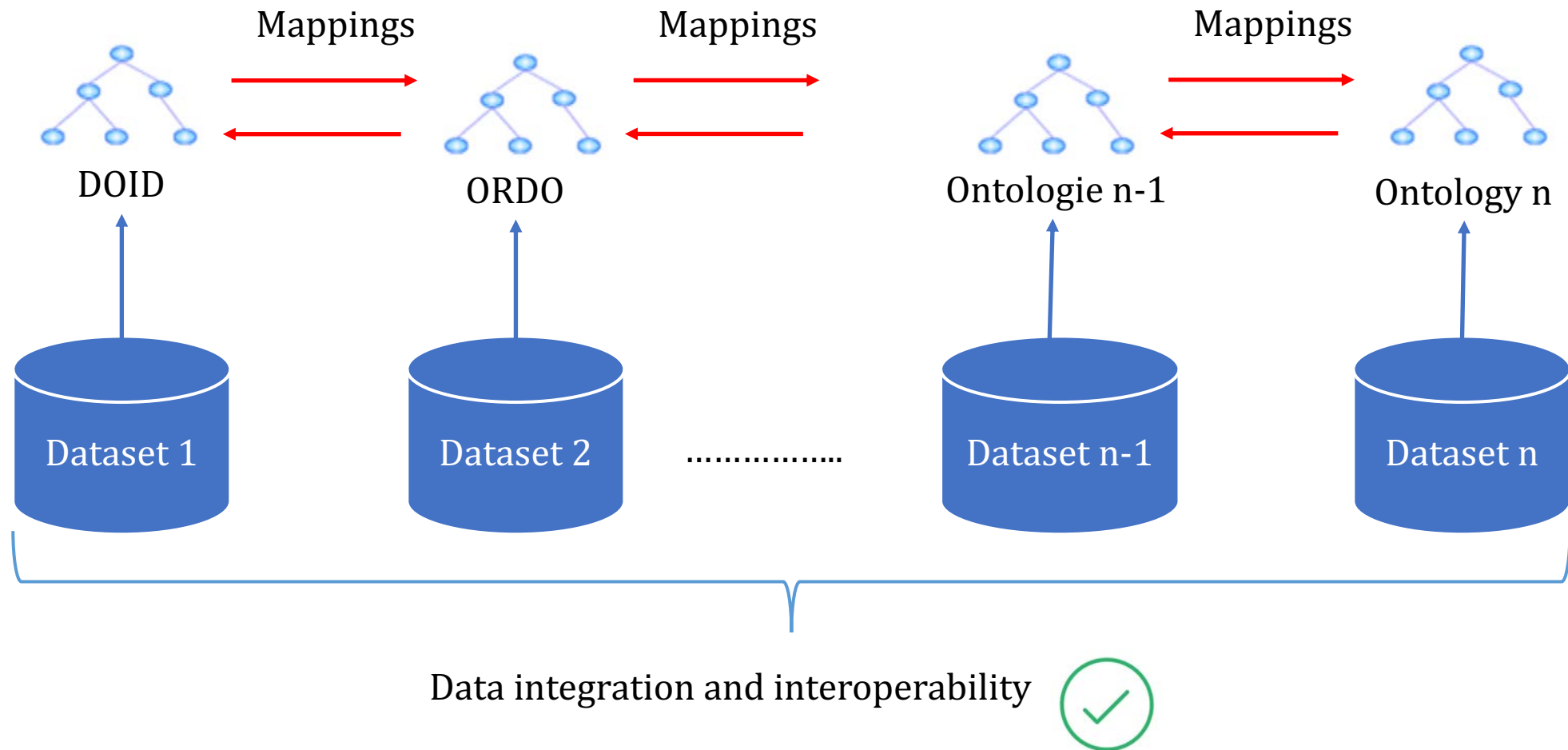
Ontology alignments management

- Retrieve or enter alignments
- Format of alignments
- Import alignments generated with external tools

Differences
between
theory...



... and reality.



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**



All aspects of ontology alignments

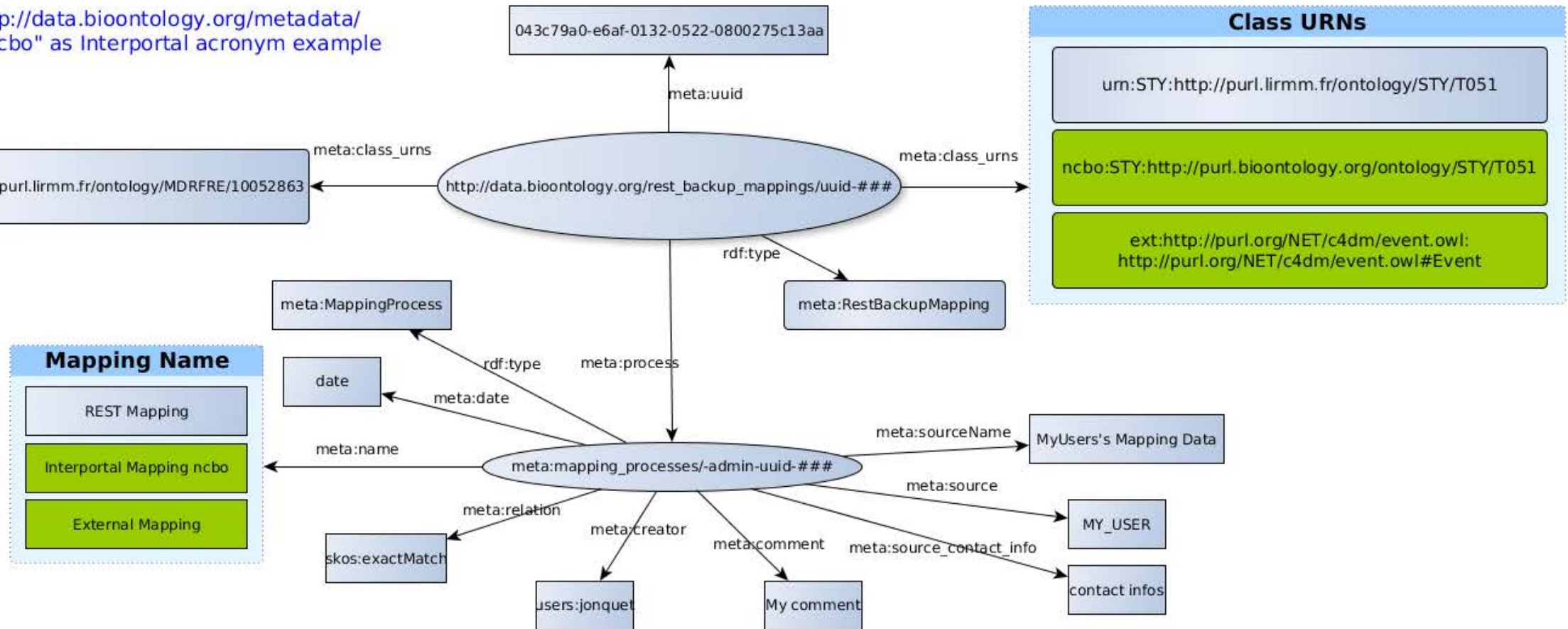


Different types of mappings

- Mappings uploaded (and stored within the portal)
 - *RestBackupMapping* - A mapping added by a user using the REST API (or the UI).
 - Materialized into the triple-store.
- Mappings created (automatically by the portal)
 - *SameURI* - Created between 2 concepts with the same URI.
 - *LOOM* - Lexical mappings created between 2 concepts with equivalent labels (preferred name): removing accents, spaces and special characters.
 - *CUI* - Created between 2 concepts that have the same CUI (Concept Unique Identifiers). The CUI is an unique identifier used by UMLS.
 - Not materialized in the triple-store, generated on-the-fly.

Representation of mappings inside AgroPortal

meta: = <http://data.bioontology.org/metadata/>
N.B.: using "ncbo" as Interportal acronym example



Example with translation mappings

- Mappings between 2 ontologies hosted in different « bioportal » instances
- Tagged with different mapping properties

```
{"creator":"http://data.stageportal.lirmm.fr/users/AAmina" ,  
  "source_contact_info":"a_annane@esi.dz",  
  "relation" : ["http://www.w3.org/2004/02/skos/core#exactMatch",  
                "http://purl.org/linguistics/gold/freeTranslation"],  
  "source":"REST",  
  "source_name":"Reconciliation of multilingual mapping",  
  "comment" : "Multilingual mapping",  
  "classes" : { "http://chu-rouen.fr/cismef/SNOMED_int.#A-01020" : "SNMIFRE",  
                "http://purl.bioontology.org/ontology/SNMI/A-01020" : "ncbo:SNMI"}}
```

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

Powered by NCBO BioPortal [Release Notes](#)

- When browsing an ontology, one can retrieve mappings for the whole ontology hosted in the repository
- When browsing a concept, one can retrieve mappings for this specific concept



Alignments in AgroPortal

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

silicon forms

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

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Enable to store external mappings
i.e., mappings with only one concept in AgroPortal

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

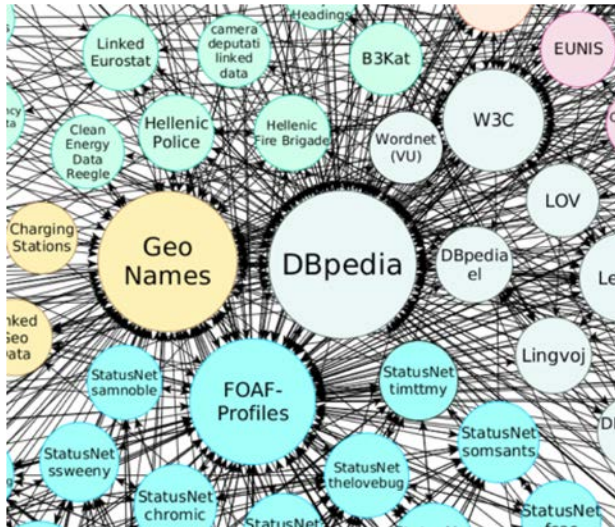
MAPPING TO	ONTOLOGY	SOURCE	RELATIONS
There are currently no interportal mappings for this class.			

External mappings

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

Mappings to external resources were also extracted

- e.g.,



What to do now: analysis and feedback to community to improve the dataset

AGROVOC - AGROVOC (84,030)

☒ Table
 ☐ Visualization

ONTOLOGY	MAPPINGS
Agri-Food Experiment Ontology	1
Agricultural and Nutrition Technology Ontology	2
Agriculture and Forestry Ontology	22
AGRORDF	2
AnaEE Thesaurus	333
Animal Disease Ontology	17
Animal Trait Ontology for Livestock	3
Biodiversity Thesaurus	255
Biological Collections Ontology	1
Biorefinery	2
Brachiaria Ontology	1
Brassica Ontology	2
Cassava Trait Ontology	1
Castor Bean Ontology	1
Cell Ontology	19
Chickpea Ontology	2
Common bean Ontology	1
Cowpea Trait Ontology	1
Darwin-SW	1
EDAM bioinformatics operations, data types, formats, identifiers and topics	6
Environment Ontology	29
Experimental Factor Ontology	85
External Mappings	47,809
Flora Phenotype Ontology	5
FoodOn	192

Mappings entre ontologies: a few exemples

- <http://agroportal.lirmm.fr/ontologies/STY?p=classes&conceptid=http%3A%2F%2Fpurl.bioontology.org%2Fontology%2FSTY%2FT002#mappings>
- <http://bioportal.lirmm.fr/ontologies/MSHFRE/?p=classes&conceptid=http%3A%2F%2Fpurl.lirmm.fr%2Fontology%2FMSHFRE%2FD012959>



Your turn!



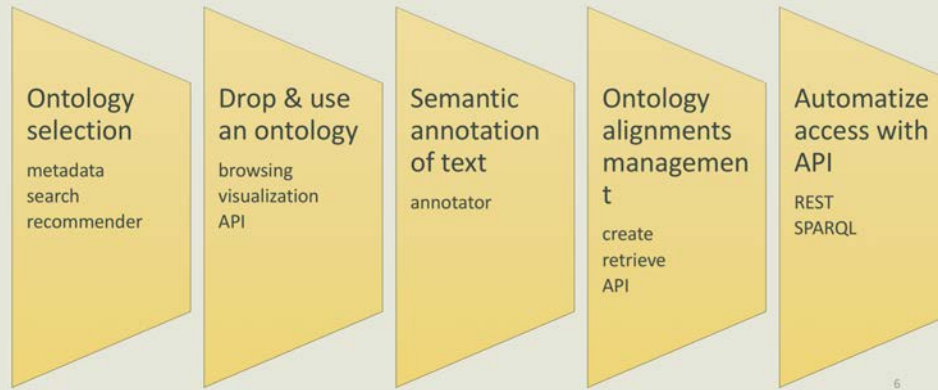
Retrieve all the alignments generated by the portal for your favorite ontology



Enter (relevant) alignments between classes of different ontologies



Enter alignments to classes that are not in portal
e.g., DBPedia (AgroPortal only)



Automatize access with API

- REST
- SPARQL

REST Web Service API:

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

Home

General Usage

Search

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Recommender

Resource Index

Batch

Ontology Analytics

Resources

Media Types and Hypermedia Links

Category

Class

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Mapping

Metric

Note

Reply

Ontology

OntologySubmission

Project

ProvisionalClass

Review

Slice

User

Content Types

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: - Using the <code>apikey</code> query string parameter - Providing 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 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=preflabel,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.agroportal.lirmm.fr/test/

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

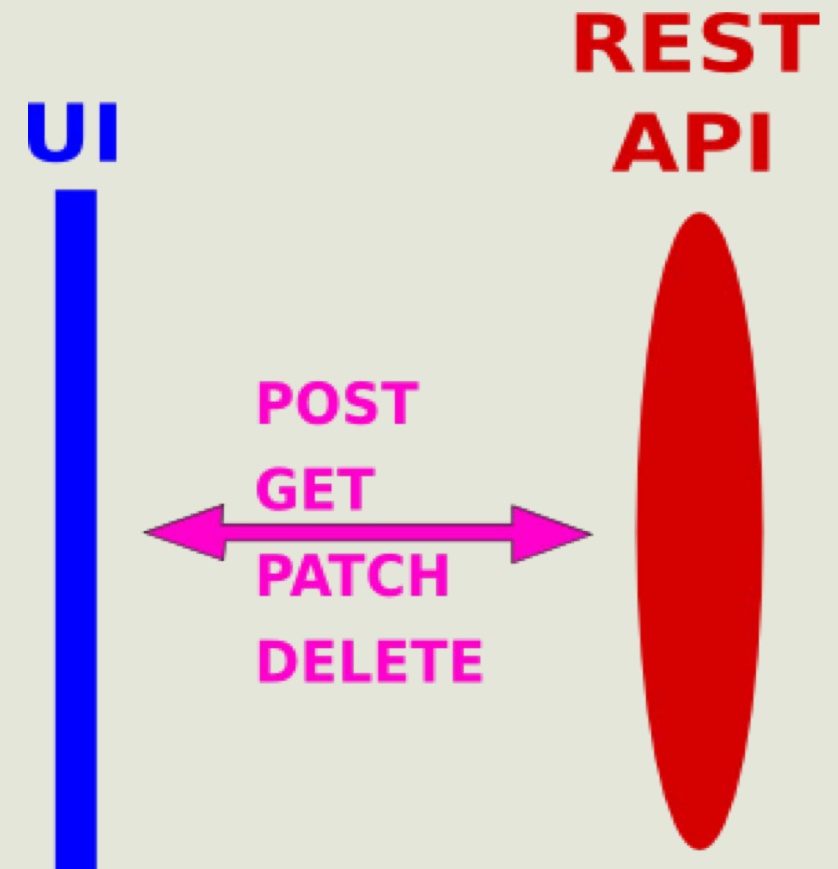
Execute

Effacer

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What's a REST API?

- Uses HTTP protocol to access web resource
- Access to a resource via its URL
- Native HTTP operations:
 - GET (retrieve a resource)
 - POST/PUT (create)
 - PATCH (modify)
 - DELETE (delete)



BioPortal/AgroPortal/EcoPortal REST API

- Data are exposed in JSON or XML with the following base URLs:
 - <http://data.agroportal.lirmm.fr/>
 - <http://data.bioontology.org/>
 - <http://193.204.79.110:8080> (for EcoPortal)
- Operations are applied on these data with HTTP queries
 - <http://data.agroportal.lirmm.fr/documentation>
 - GET queries retrieve objects (ontologies, classes, mappings, users, project, slice, etc.)
 - PUT queries create objects
 - PATCH queries modify objects
 - DELETE queries delete objects
- Exemple: <http://data.agroportal.lirmm.fr/users?apikey=XXX&display=all>

Access to data via REST API

agroportal.lirmm.fr/ontologies

Browse Search Mappings Recommender Annotator Projects Sign

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 39 of 39 Sort: Popular

[Submit New Ontology](#)

Entry Type

- ☒ Ontology (99)
- ☐ Ontology View (0)
- ☐ CIMI Model (0)
- ☐ NLM Value Set (0)

Uploaded In the Last

Category

- ☐ 010-089 General Germplasm...
- ☐ 100-299 Plant Anatomy and D...
- ☐ 300-499 Phenotype and Trait...
- ☐ 500-699 Structural and Funct...
- ☐ 700-799 Location and Environ...
- ☐ Crop Ontology (8)
- ☐ Reference ontologies for plant...

Group

- ☐ CROP (17)
- ☐ LOVINRA (2)
- ☐ RICE (9)
- ☐ WHEAT (23)

Format

- ☐ OBO (17)
- ☐ OWL (20)
- ☐ UMLS (2)

Plant Trait Ontology (TO)

A controlled vocabulary to describe phenotypic traits in plants

Uploaded: 2/2/16

1 projects 2,258 classes

Plant Ontology (PO)

The Plant Ontology is a structured vocabulary and database resource that links plant anatomy, morphology and growth and development to plant genomics data

Uploaded: 2/2/16

2 projects 1,728 classes

Wheat Trait Ontology (WHEATPHENOTYPE)

WheatPhenotype is an ontology of wheat traits and environmental factors that affect these traits

Uploaded: 7/1/15

2 projects 466 classes

Matter transfer ontology (TRANSMAT)

The Matter Transfer ontology is dedicated to matter transfer (eg O2, CO2, H2O) and mechanical properties of materials (eg food, packaging).

Uploaded: 3/14/16

2 projects 1,053 classes

Biorefinery (BIOREFINERY)

This vocabulary describes characteristics of biomass relevant for bio-refinery and unitary operations to transform a biomass in glucose.

Uploaded: 3/14/16

1 notes 1 projects 344 classes

National Center for Biotechnology Information (NCBI) Organismal Classification (NCBITAXON)

The NCBI Taxonomy Database is a curated classification and nomenclature for all of the organisms in the public sequence databases.

Uploaded: 6/23/15

1 projects 906,907 classes

OntoBiotope (ONTOBIOTOPE)

The OntoBiotope Ontology describes all types of microorganism biotopes

Uploaded: 6/29/15

2 projects 1,756 classes

```
data.agroportal.lirmm.fr/ontologies?apikey=*****

[
  - {
    - administeredBy: [
      http://data.agroportal.lirmm.fr/users/admin
    ],
    acronym: "SIO",
    name: "Semanticscience Integrated Ontology",
    summaryOnly: null,
    ontologyType: http://data.agroportal.lirmm.fr/ontology_types/ONTOLOGY,
    @id: http://data.agroportal.lirmm.fr/ontologies/SIO,
    @type: http://data.bioontology.org/metadata/Ontology,
    - links: {
      submissions: http://data.agroportal.lirmm.fr/ontologies/SIO/submissions,
      properties: http://data.agroportal.lirmm.fr/ontologies/SIO/properties,
      classes: http://data.agroportal.lirmm.fr/ontologies/SIO/classes,
      single_class: http://data.agroportal.lirmm.fr/ontologies/SIO/classes/{class_id},
      roots: http://data.agroportal.lirmm.fr/ontologies/SIO/classes/roots,
      instances: http://data.agroportal.lirmm.fr/ontologies/SIO/instances,
      metrics: http://data.agroportal.lirmm.fr/ontologies/SIO/metrics,
      reviews: http://data.agroportal.lirmm.fr/ontologies/SIO/reviews,
      notes: http://data.agroportal.lirmm.fr/ontologies/SIO/notes,
      groups: http://data.agroportal.lirmm.fr/ontologies/SIO/groups,
      categories: http://data.agroportal.lirmm.fr/ontologies/SIO/categories,
      latest_submission: http://data.agroportal.lirmm.fr/ontologies/SIO/latest_submission,
      projects: http://data.agroportal.lirmm.fr/ontologies/SIO/projects,
      download: http://data.agroportal.lirmm.fr/ontologies/SIO/download,
      views: http://data.agroportal.lirmm.fr/ontologies/SIO/views,
      analytics: http://data.agroportal.lirmm.fr/ontologies/SIO/analytics,
      ui: http://agroportal.lirmm.fr/ontologies/SIO,
    - @context: {
      submissions: http://data.bioontology.org/metadata/OntologySubmission,
      properties: http://data.bioontology.org/metadata/Property,
      classes: http://www.w3.org/2002/07/owl#Class,
      single_class: http://www.w3.org/2002/07/owl#Class,
      roots: http://www.w3.org/2002/07/owl#Class,
      instances: http://data.bioontology.org/metadata/Instance,
      metrics: http://data.bioontology.org/metadata/Metrics,
      reviews: http://data.bioontology.org/metadata/Review,
      notes: http://data.bioontology.org/metadata/Note,
      groups: http://data.bioontology.org/metadata/Group,
      categories: http://data.bioontology.org/metadata/Category,
      latest_submission: http://data.bioontology.org/metadata/OntologySubmission,
      projects: http://data.bioontology.org/metadata/Project,
      download: http://data.bioontology.org/metadata/Ontology,
      views: http://data.bioontology.org/metadata/Ontology,
      analytics: http://data.bioontology.org/metadata/Analytics,
      ui: http://data.bioontology.org/metadata/Ontology
    }
  }
]
```

data.agroportal.lirmm.fr/ontologies?apikey=***

agroportal.lirmm.fr/ontologies

Access to services via REST API

agroportal.lirmm.fr/annotator

Rechercher

AgroPortal lirmm

Browse Search Mappings Recommender Annotator Projects

Sign in

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 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.

Insert sample text

banana

Select Ontologies

Type here to select ontologies or leave blank to use all

clear selection select from list

Select UMLS Semantic Types

Type here to select UMLS semantic types

☐ Match Longest Only ☐ Include Mappings

☐ Exclude Numbers ☐ Match Partial Words

☐ Exclude Synonyms

Include Ancestors Up To Level:

Include Score:

Get Annotations

Annotations

total results 2 (direct 2 / ancestor 0)

CLASS	filter	ONTOLOGY	filter	TYPE	filter	CONTEXT	MATCHED CLASS	filter	MATCHED ONTOLOGY
Banana		Banana Ontology		direct		banana	Banana		Banana Ontology
fruit		Banana Anatomy		direct		banana	fruit		Banana Anatomy

Format Results As:

agroportal.lirmm.fr/annotator

services.agroportal.lirmm.fr/annotator/?text="banana"&apikey

Rechercher

```
[
  {
    annotatedClass: {
      "@id": http://purl.obolibrary.org/obo/CO_325_ROOT,
      "@type": http://www.w3.org/2002/07/owl#Class,
      links: {
        self: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT,
        ontology: http://data.agroportal.lirmm.fr/ontologies/CO_325,
        children: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT/children,
        parents: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT/parents,
        descendants: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT/descendants,
        ancestors: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT/ancestors,
        instances: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT/instances,
        tree: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT/tree,
        notes: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT/notes,
        mappings: http://data.agroportal.lirmm.fr/ontologies/CO_325/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT/mappings,
        ui: http://agroportal.lirmm.fr/ontologies/CO_325?p=classes&conceptid=http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FCO_325_ROOT,
      }
    },
    "@context": {
      self: http://www.w3.org/2002/07/owl#Class,
      ontology: http://data.bioontology.org/metadata/Ontology,
      children: http://www.w3.org/2002/07/owl#Class,
      parents: http://www.w3.org/2002/07/owl#Class,
      descendants: http://www.w3.org/2002/07/owl#Class,
      ancestors: http://www.w3.org/2002/07/owl#Class,
      instances: http://data.bioontology.org/metadata/Instance,
      tree: http://www.w3.org/2002/07/owl#Class,
      notes: http://data.bioontology.org/metadata/Note,
      mappings: http://data.bioontology.org/metadata/Mapping,
      ui: http://www.w3.org/2002/07/owl#Class
    }
  },
  "@context": {
    "@vocab": http://data.bioontology.org/metadata/
  }
},
hierarchy: [ ],
annotations: [
  {
    from: 2,
    to: 7,
    matchType: "PREF",
    text: "BANANA"
  }
],
mappings: [ ]
}
```

services.agroportal.lirmm.fr/annotator/?text="banana"&apikey=***

Examples of REST calls

- Get information about a user
 - <http://data.agroportal.lirmm.fr/users/jonquet>
- Get information about a group
 - <http://data.agroportal.lirmm.fr/groups/LOVINRA>
- Retrieve information about an ontology
 - http://data.agroportal.lirmm.fr/ontologies/CO_125
- Get information about a project
 - <http://data.agroportal.lirmm.fr/projects/SIFR>

Examples of REST calls for mappings

- Retrieve a specific mapping by id
 - <http://data.agroportal.lirmm.fr/mappings/fd709e40-fcab-0132-77e3-525400026749>
- Retrieve mappings btw 2 ontologies
 - <http://data.agroportal.lirmm.fr/mappings?ontologies=BT,CL>
- Get all the mappings for a given ontology
 - <http://data.agroportal.lirmm.fr/ontologies/CL/mappings>
- Get all the mappings of a given class
 - http://data.agroportal.lirmm.fr/ontologies/CL/classes/http%3A%2F%2Fpurl.obolibrary.org%2Fobo%2FUBERON_0000479/mappings

Examples of SPARQL queries (1/2)

// all triples about ontologies

```
SELECT ?s ?p ?o WHERE {  
  GRAPH  
  <http://data.bioontology.org/ontologies/ANAEETHES/submissions/3>{  
    ?s ?p ?o .  
  }  
LIMIT 30
```

// list of all username

```
PREFIX meta: <http://data.bioontology.org/metadata/>  
  
SELECT DISTINCT ?user WHERE {  
  GRAPH <http://data.bioontology.org/metadata/User> {  
    ?user meta:username ?o .  
  }  
}
```

//liste des graphes dans 4stores

```
SELECT DISTINCT ?g WHERE {  
  GRAPH ?g {  
    ?s a ?p .  
  }  
}
```

Examples of SPARQL queries (2/2)

```
//Get 20 first concept labels from the ANAETHES thesaurus.
```

```
PREFIX skos: <http://www.w3.org/2004/02/skos/core#>
```

```
SELECT DISTINCT ?s ?label WHERE {
```

```
  GRAPH
```

```
  <http://data.bioontology.org/ontologies/ANAEETHES/submissions/3> {
```

```
    ?s a skos:Concept .
```

```
    ?s skos:prefLabel ?label .
```

```
  }
```

```
}
```

```
ORDER BY DESC(?label)
```

```
LIMIT 20
```

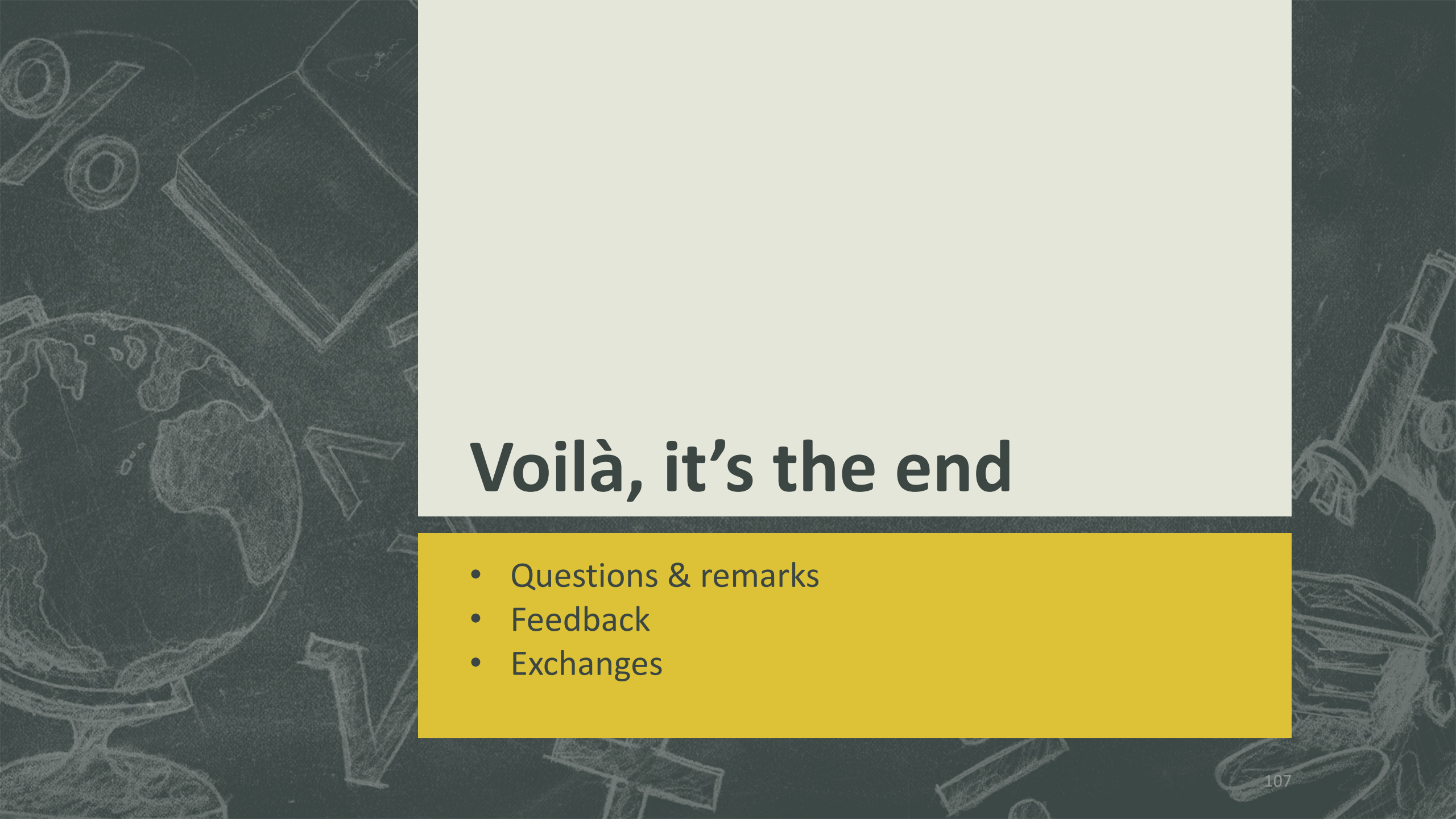
Your turn!



Fire a few REST calls

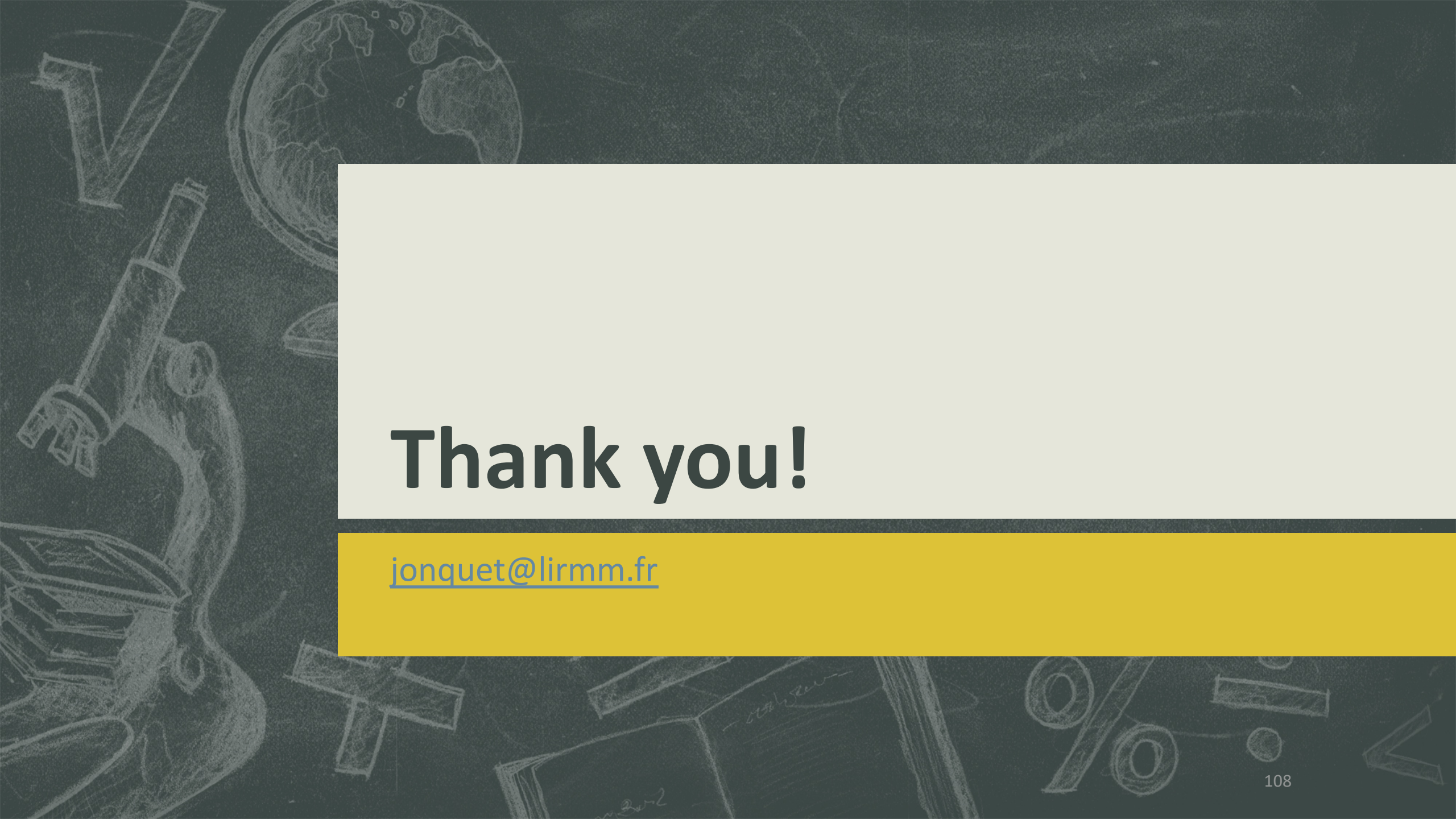


... and SPARQL queries

A dark grey background with faint, light grey chalk-like drawings of various school and science items. On the left, there's a globe showing continents. Above it, a book with 'class' written on its cover. To the right, a microscope. At the bottom, a satellite or space station. Various geometric shapes like circles, rectangles, and arrows are scattered throughout.

Voilà, it's the end

- Questions & remarks
- Feedback
- Exchanges

The background is a dark chalkboard filled with various white chalk sketches. In the top left, there's a large 'V' and a globe. Below the globe is a detailed drawing of a microscope. To the right of the microscope is a large plus sign. In the bottom left, there's a stack of books. In the bottom center, there's an open book with some handwritten text. To the right of the open book is a large percentage sign. In the bottom right corner, there's a less-than sign. The overall theme is scientific and academic.

Thank you!

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