



Integration von Terminologiediensten
in Wissensdomänen der NFDI

Inhalt

▶ Hintergrund



Inhalt

- ▶ Hintergrund
- ▶ Aktuelle Situation



Inhalt

- ▶ Hintergrund
- ▶ Aktuelle Situation
- ▶ Ausblick



Hintergrund



Hintergrund – Wer bin ich?

Roman Baum

- ▶ Wissenschaftlicher Softwareentwickler
- ▶ Informatikstudium
- ▶ Forschungsgruppe Wissensmanagement (Prof. Dr. Juliane Fluck)
- ▶ ZB MED - Informationszentrum Lebenswissenschaften
- ▶ Co-Spokesperson der NFDI Arbeitsgruppe Terminology Services in der Sektion „(Meta)daten, Terminologien, Provenienz“

Hintergrund – NFDI

Nationale Forschungsdateninfrastruktur (NFDI)

- ▶ Ziel: Erstellung eines permanenten digitalen Wissensrepositorium für das deutsche Wissenschaftssystem

Hintergrund – NFDI

Nationale Forschungsdateninfrastruktur (NFDI)

- ▶ Ziel: Erstellung eines permanenten digitalen Wissensrepositorium für das deutsche Wissenschaftssystem
- ▶ Daten sollen unter Berücksichtigung der FAIR-Prinzipien zur Verfügung gestellt werden

Hintergrund – NFDI

Nationale Forschungsdateninfrastruktur (NFDI)

- ▶ Ziel: Erstellung eines permanenten digitalen Wissensrepositorium für das deutsche Wissenschaftssystem
- ▶ Daten sollen unter Berücksichtigung der FAIR-Prinzipien zur Verfügung gestellt werden
- ▶ 27 NFDI Konsortien (z.B. NFDI4Health, NFDI4Culture, Base4NFDI, ...)

Hintergrund – NFDI

Nationale Forschungsdateninfrastruktur (NFDI)

- ▶ Ziel: Erstellung eines permanenten digitalen Wissensrepositorium für das deutsche Wissenschaftssystem
- ▶ Daten sollen unter Berücksichtigung der FAIR-Prinzipien zur Verfügung gestellt werden
- ▶ 27 NFDI Konsortien (z.B. NFDI4Health, NFDI4Culture, Base4NFDI, ...)
- ▶ 5 Sektionen (**(Meta)data Terminologies and Provenance**, Common Infrastructures, Ethical, Legal and Social Aspects and Training & Education , Industry Engagement)

Hintergrund – NFDI

Nationale Forschungsdateninfrastruktur (NFDI)

- ▶ Ziel: Erstellung eines permanenten digitalen Wissensrepositorium für das deutsche Wissenschaftssystem
- ▶ Daten sollen unter Berücksichtigung der FAIR-Prinzipien zur Verfügung gestellt werden
- ▶ 27 NFDI Konsortien (z.B. NFDI4Health, NFDI4Culture, Base4NFDI, ...)
- ▶ 5 Sektionen (**(Meta)data Terminologies and Provenance**, Common Infrastructures, Ethical, Legal and Social Aspects and Training & Education , Industry Engagement)
 - ▶ Beherbergen diverse Arbeitsgruppen (z.B. Terminology Services)

Hintergrund – Terminologiedienste

Terminologiedienste

- ▶ Stellen (diverse) softwarebasierte Services für Terminologien bereit

Hintergrund – Terminologiedienste

Terminologiedienste

- ▶ Stellen (diverse) softwarebasierte Services für Terminologien bereit
- ▶ Autovervollständigung, (hierarchische) Beziehungen, Synonyme

Hintergrund – Terminologiedienste

Terminologiedienste

- ▶ Stellen (diverse) softwarebasierte Services für Terminologien bereit
- ▶ Autovervollständigung, (hierarchische) Beziehungen, Synonyme
- ▶ Häufig verwendete Terminologiedienste:
 - ▶ Ontology Lookup Service (OLS)

Hintergrund – Terminologiedienste

Terminologiedienste

- ▶ Stellen (diverse) softwarebasierte Services für Terminologien bereit
- ▶ Autovervollständigung, (hierarchische) Beziehungen, Synonyme
- ▶ Häufig verwendete Terminologiedienste:
 - ▶ Ontology Lookup Service (OLS)
 - ▶ NCBO BioPortal (OntoPortal)

Hintergrund – Terminologiedienste

Terminologiedienste

- ▶ Stellen (diverse) softwarebasierte Services für Terminologien bereit
- ▶ Autovervollständigung, (hierarchische) Beziehungen, Synonyme
- ▶ Häufig verwendete Terminologiedienste:
 - ▶ Ontology Lookup Service (OLS)
 - ▶ NCBO BioPortal (OntoPortal)
 - ▶ Ontobee (OBO Foundry library ontologies)

Hintergrund – Terminologiedienste

Terminologiedienste

- ▶ Stellen (diverse) softwarebasierte Services für Terminologien bereit
- ▶ Autovervollständigung, (hierarchische) Beziehungen, Synonyme
- ▶ Häufig verwendete Terminologiedienste:
 - ▶ Ontology Lookup Service (OLS)
 - ▶ NCBO BioPortal (OntoPortal)
 - ▶ Ontobee (OBO Foundry library ontologies)
 - ▶ Skosmos

Hintergrund – Terminologiedienste

Terminologiedienste

- ▶ Stellen (diverse) softwarebasierte Services für Terminologien bereit
- ▶ Autovervollständigung, (hierarchische) Beziehungen, Synonyme
- ▶ Häufig verwendete Terminologiedienste:
 - ▶ Ontology Lookup Service (OLS)
 - ▶ NCBO BioPortal (OntoPortal)
 - ▶ Ontobee (OBO Foundry library ontologies)
 - ▶ Skosmos
 - ▶ Snowstorm

Hintergrund – Terminologiedienste

Terminologiedienste

- ▶ Stellen den Zugang zum Inhalt von Terminologien sicher

Terminologieregistry

- ▶ Sammlung von Informationen über Terminologien (z.B. eine einfache Auflistung von Terminologien)

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS)

- ▶ Entwickelt durch das Samples, Phenotypes and Ontologies Team (SPOT) vom EMBL's European Bioinformatics Institute (EMBL-EBI)

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS)

- ▶ Entwickelt durch das Samples, Phenotypes and Ontologies Team (SPOT) vom EMBL's European Bioinformatics Institute (EMBL-EBI)
- ▶ Repository für (biomedizinische) Ontologien

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS)

- ▶ Entwickelt durch das Samples, Phenotypes and Ontologies Team (SPOT) vom EMBL's European Bioinformatics Institute (EMBL-EBI)
- ▶ Repository für (biomedizinische) Ontologien
- ▶ Programmatischer Zugriff mittels einer API

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS)

- ▶ Entwickelt durch das Samples, Phenotypes and Ontologies Team (SPOT) vom EMBL's European Bioinformatics Institute (EMBL-EBI)
- ▶ Repository für (biomedizinische) Ontologien
- ▶ Programmatischer Zugriff mittels einer API
- ▶ Weitere Services:
 - ▶ OxO – mappings (oder Crossreferenzen) zwischen Konzepten verschiedener Ontologien

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS)

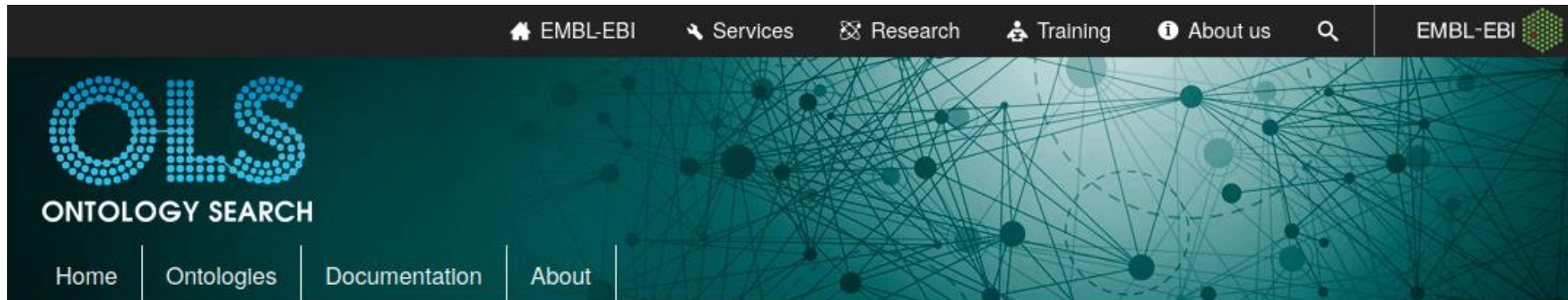
- ▶ Entwickelt durch das Samples, Phenotypes and Ontologies Team (SPOT) vom EMBL's European Bioinformatics Institute (EMBL-EBI)
- ▶ Repository für (biomedizinische) Ontologien
- ▶ Programmatischer Zugriff mittels einer API
- ▶ Weitere Services:
 - ▶ OxO – mappings (oder Crossreferenzen) zwischen Konzepten verschiedener Ontologien
 - ▶ Zooma – Annotationservice für Freitexte

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS)

- ▶ Entwickelt durch das Samples, Phenotypes and Ontologies Team (SPOT) vom EMBL's European Bioinformatics Institute (EMBL-EBI)
- ▶ Repository für (biomedizinische) Ontologien
- ▶ Programmatischer Zugriff mittels einer API
- ▶ Weitere Services:
 - ▶ OxO – mappings (oder Crossreferenzen) zwischen Konzepten verschiedener Ontologien
 - ▶ Zooma – Annotationsservice für Freitexte
- ▶ Bietet eine grafische Oberfläche zur Visualisierung von Ontologien

Hintergrund – Terminologiedienste



Welcome to the EMBL-EBI Ontology Lookup Service

[Search](#)

Examples: [diabetes](#), [GO:0098743](#) [Looking for a particular ontology?](#)

Data Content

Updated 02 Feb 2022
14:43

- 273 ontologies
- 7,188,970 terms
- 44,841 properties
- 493,817 Individuals

About OLS

The Ontology Lookup Service (OLS) is a repository for biomedical ontologies that aims to provide a single point of access to the latest ontoloav

Related Tools

In addition to OLS the SPOT team also provides the OxO, Zooma and Webulous services. OxO provides cross-ontology mappings between terms from

Report an Issue

For feedback, enquiries or suggestion about OLS or to request a new ontology please use our GitHub [Issue tracker](#). For announcements relating to

Tweets by @EBIOLS

EBISPOT OLS
@EBIOLS

OLS is back up and running again!

Feb 27, 2022

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS) + OXO

- ▶ Es ist möglich unabhängig Frontends zu erstellen

Hintergrund – Terminologiedienste

SEMLOOKP

Terminology Service - Project:
IDSN

Home

Resources

About

Contact

Welcome to the Terminology Service



Examples: [diabetes](#), [GO:0098743](#)

[Looking for a particular resource?](#)

Data Content

Updated 11 Jan 2022
08:45

- 26 ontologies and terminologies
- 3,921,106 terms
- 3,160 properties
- 289,176 individuals
- Version 3.2.1-SNAPSHOT

[About the Terminology Service](#)

The Terminology Service is a repository for biomedical resources that aims to provide a single point of access to the latest ontology and terminology versions. You can browse the resources through the website as well as programmatically via our API.

It is part of the Semantic Lookup Platform, which is developed and maintained by ZB MED - Information Centre for Life Sciences

Hintergrund – Terminologiedienste



Home

Ontologies

Help

Documentation

About

Welcome to the NFDI4Chem Terminology Service

Search

Examples: [oxidation](#), [IAO_0020000](#)

[Looking for a particular ontology?](#)

About NFDI4ChemTS

The NFDI4Chem Terminology Service is a repository for chemistry and related ontologies providing a single point of access to the latest ontology versions. You can browse or search the ontologies and look into their terms and relations. The Terminology Service can be used either by humans through the website or by machines via the TS API. The NFDI4Chem Terminology Service is developed and maintained by TIB - Leibniz Information Centre for Science and Technology. It is part of the service portfolio of the NFDI4Chem consortium within the National Research Data Infrastructure.

Data Content

Updated 21 Jan 2022

15:10

- 21 ontologies
- 238,741 terms
- 2,998 properties
- 3,111 individuals

Tweets by @Nfdi4Chem



NFDI4Chem
@Nfdi4Chem

Die @NFDI_de -Konsortien beziehen Stellung zur Etablierung von #Basisdiensten: Ermittlung der Bedarfe und Verständigung über gemeinsame infrastrukturelle Grundversorgung ist gut

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS) + OXO

- ▶ Es ist möglich unabhängig Frontends zu erstellen
- ▶ Es existieren Widgets für die Autovervollständigung und die Hierarchieansicht

Hintergrund – Terminologiedienste

Ontology Lookup Service (OLS) + OXO

- ▶ Es ist möglich unabhängig Frontends zu erstellen
- ▶ Es existieren Widgets für die Autovervollständigung und die Hierarchieansicht
- ▶ Beinhalten Metadaten von Ontologien

Aktuelle Situation



Aktuelle Situation - NFDI

Terminology Services

- ▶ Published a Working Group Charter
- ▶ Some goals:
 - ▶ Share knowledge
 - ▶ Uniform terminology access
- ▶ Q3 - Q4 2022: Evaluating the state of the art

DOI: [10.5281/zenodo.6759325](https://doi.org/10.5281/zenodo.6759325)



Aktuelle Situation - NFDI

Terminology Services

- ▶ Published a Working Group Charter
- ▶ Some goals:
 - ▶ Share knowledge
 - ▶ Uniform terminology access
- ▶ Q3 - Q4 2022: **Evaluating the state of the art**

DOI: [10.5281/zenodo.6759325](https://doi.org/10.5281/zenodo.6759325)



Aktuelle Situation - NFDI

Terminologiedienste – Evaluierung der aktuellen Situation

Aktuelle Situation - NFDI

Terminologiedienste – Evaluierung der aktuellen Situation

consortia	name of service or registry	URL	service maintainer	contact	type	Software used
NFDI4Health	SemLookP	https://semanticlookup.zbmed.de/	ZB MED		service	Ontology Lookup Service (OLS)
NFDI4Biodiversity	GFBio Terminology Service	https://terminologies.gfbio.org	InfAI		service	own dev, planned ontportal technology
NDFI4Objects	DANTE	https://api.dante.gbv.de	VZG		service	own dev, compatible with JSKOS-Server
NDFI4Objects	coli-conc KOS registry	https://coli-conc.gbv.de/api/	VZG		service	JSKOS Server
NDFI4Chem	NFDI4Chem Terminology Service	https://terminology.nfdi4chem.de/	TIB		service	Ontology Lookup Service (OLS)
NFDI4Ing	NFDI4Ing Terminology Service	https://terminology.nfdi4ing.de/ts4ing/in	TIB		service	Ontology Lookup Service (OLS)
DataPLANT	SwateOntology DB / Swobup	https://github.com/nfdi4plants/Swobup	?		?	own dev
GHGA						
KonsortSWD	Thesaurus for the Social Sciences TheSoz	https://lod.gesis.org/de/	GESIS		service	Skosmos
KonsortSWD	CESSDA Vocabulary Service	https://vocabularies.cessda.eu/	CESSDA Main Office		service	own dev
KonsortSWD	Metadata and Vocabulary Verbund FDB (Metadata Redigstry, MDR)	https://mdr.iqb.hu-berlin.de/#/catalog	IQB Berlin für Verbund For	Lisa Pegelov	service	
NFDI4Cat		https://nfdi4cat.org/services/ontologie-s	DECHEMA		registry	own dev
NFDI4Culture	GND (as terminology backbone)	https://gnd.network	DNB / GND Cooperative		service	
Text+	GND (as terminology backbone)	https://gnd.network	DNB / GND Cooperative		service	
BERD@NFDI	-					
DAPHNE4NFDI						
FAIRmat	NOMAD Metainfo	https://nomad-lab.eu/prod/v1/gui/analyze	HUB	Luca Ghiring	registry	own dev
FAIRmat	NOMAD Laboratory	https://nomad-lab.eu/prod/v1/gui/about	HUB	Markus Sche	service	own dev
MaRDI						
NFDI4DataScience						
NFDI4Earth	NERC Vocabulary Server (NVS)	https://vocab.nerc.ac.uk/	National Oceanography Centre - British		service	own dev
NFDI4Earth	BARTOC Skosmos	https://bartoc-skosmos.unibas.ch/	not maintained anymore, may be move t		service	Skosmos
NFDI4Microbiota						
NFDI-MatWerk						
PUNCH4NFDI						
NFDI4Health	OntoServer	https://terminology-highmed.medic.mec	Maybe Faculty of Medicine at University		service	CSIRO Ontoserver
NFDI4Health	Snowstorm		?		service	IHTSDO Snowstorm
NFDI4Health	LOINC	https://loinc.org/fhir/	Regenstrief Institute		service	?

Aktuelle Situation - NFDI

Terminologiedienste – Evaluierung der aktuellen Situation

consortia	name of service or registry	URL	service maintainer	contact	type	Software used
NFDI4Health	SemLookP	https://semanticlookup.zbmed.de/	ZB MED		service	Ontology Lookup Service (OLS)
NFDI4Biodiversity	GFBio Terminology Service	https://terminologies.gfbio.org	InfAI		service	own dev, planned ontportal technology
NDFI4Objects	DANTE	https://api.dante.gbv.de	VZG		service	own dev, compatible with JSKOS-Server
NDFI4Objects	coli-conc KOS registry	https://coli-conc.gbv.de/api/	VZG		service	JSKOS Server
NDFI4Chem	NFDI4Chem Terminology Service	https://terminology.nfdi4chem.de/	TIB		service	Ontology Lookup Service (OLS)
NFDI4Ing	NFDI4Ing Terminology Service	https://terminology.nfdi4ing.de/ts4ing/in	TIB		service	Ontology Lookup Service (OLS)
DataPLANT	SwateOntology DB / Swobup	https://github.com/nfdi4plants/Swobup	?		?	own dev
GHGA						
KonsortSWD	Thesaurus for the Social Sciences TheSoz	https://lod.gesis.org/de/	GESIS		service	Skosmos
KonsortSWD	CESSDA Vocabulary Service	https://vocabularies.cessda.eu/	CESSDA Main Office		service	own dev
KonsortSWD	Metadata and Vocabulary Verbund FDB (Metadata Redigstry, MDR)	https://mdr.iqb.hu-berlin.de/#/catalog	IQB Berlin für Verbund Fors	Lisa Pegelov	service	
NFDI4Cat		https://nfdi4cat.org/services/ontologie-s	DECHEMA		registry	own dev
NFDI4Culture	GND (as terminology backbone)	https://gnd.network	DNB / GND Cooperative		service	
Text+	GND (as terminology backbone)	https://gnd.network	DNB / GND Cooperative		service	
BERD@NFDI	-					
DAPHNE4NFDI						
FAIRmat	NOMAD Metainfo	https://nomad-lab.eu/prod/v1/gui/analyze	HUB	Luca Ghiring	registry	own dev
FAIRmat	NOMAD Laboratory	https://nomad-lab.eu/prod/v1/gui/about	HUB	Markus Sche	service	own dev
MaRDI						
NFDI4DataScience						
NFDI4Earth	NERC Vocabulary Server (NVS)	https://vocab.nerc.ac.uk/	National Oceanography Centre - British		service	own dev
NFDI4Earth	BARTOC Skosmos	https://bartoc-skosmos.unibas.ch/	not maintained anymore, may be move t		service	Skosmos
NFDI4Microbiota						
NFDI-MatWerk						
PUNCH4NFDI						
NFDI4Health	OntoServer	https://terminology-highmed.medic.mec	Maybe Faculty of Medicine at University		service	CSIRO Ontoserver
NFDI4Health	Snowstorm		?		service	IHTSDO Snowstorm
NFDI4Health	LOINC	https://loinc.org/fhir/	Regenstrief Institute		service	?

Aktuelle Situation - NFDI

Terminologiedienste – Evaluierung der aktuellen Situation

consortia	name of service or registry	URL	service maintainer	contact	type	Software used
NFDI4Health	SemLookP	https://semanticlookup.zbmed.de/	ZB MED		service	Ontology Lookup Service (OLS)
NFDI4Biodiversity	GFBio Terminology Service	https://terminologies.gfbio.org	InfAI		service	own dev, planned ontoportail technology
NDFI4Objects	DANTE	https://api.dante.gbv.de	VZG		service	own dev, compatible with JSKOS-Server
NDFI4Objects	coli-conc KOS registry	https://coli-conc.gbv.de/api/	VZG		service	JSKOS Server
NDFI4Chem	NFDI4Chem Terminology Service	https://terminology.nfdi4chem.de/	TIB		service	Ontology Lookup Service (OLS)
NFDI4Ing	NFDI4Ing Terminology Service	https://terminology.nfdi4ing.de/ts4ing/in	TIB		service	Ontology Lookup Service (OLS)
DataPLANT	SwateOntology DB / Swobup	https://github.com/nfdi4plants/Swobup	?		?	own dev
GHGA						
KonsortSWD	Thesaurus for the Social Sciences TheSoz	https://lod.gesis.org/de/	GESIS		service	Skosmos
KonsortSWD	CESSDA Vocabulary Service	https://vocabularies.cessda.eu/	CESSDA Main Office		service	own dev
KonsortSWD	Metadata and Vocabulary Verbund FDB (Metadata Redigstry, MDR)	https://mdr.iqb.hu-berlin.de/#/catalog	IQB Berlin für Verbund Fors	Lisa Pegelov	service	
NFDI4Cat		https://nfdi4cat.org/services/ontologie-s	DECHEMA		registry	own dev
NFDI4Culture	GND (as terminology backbone)	https://gnd.network	DNB / GND Cooperative		service	
Text+	GND (as terminology backbone)	https://gnd.network	DNB / GND Cooperative		service	
BERD@NFDI	-					
DAPHNE4NFDI						
FAIRmat	NOMAD Metainfo	https://nomad-lab.eu/prod/v1/gui/analyze	HUB	Luca Ghiring	registry	own dev
FAIRmat	NOMAD Laboratory	https://nomad-lab.eu/prod/v1/gui/about	HUB	Markus Sche	service	own dev
MaRDI						
NFDI4DataScience						
NFDI4Earth	NERC Vocabulary Server (NVS)	https://vocab.nerc.ac.uk/	National Oceanography Centre - British		service	own dev
NFDI4Earth	BARTOC Skosmos	https://bartoc-skosmos.unibas.ch/	not maintained anymore, may be move t		service	Skosmos
NFDI4Microbiota						
NFDI-MatWerk						
PUNCH4NFDI						
NFDI4Health	OntoServer	https://terminology-highmed.medic.mec	Maybe Faculty of Medicine at University		service	CSIRO Ontoserver
NFDI4Health	Snowstorm		?		service	IHTSDO Snowstorm
NFDI4Health	LOINC	https://loinc.org/fhir/	Regenstrief Institute		service	?

Aktuelle Situation - NFDI

Terminologiedienste – Evaluierung der aktuellen Situation

consortia	name of service or registry	URL	service maintainer	contact	type	Software used
NFDI4Health	SemLookP	https://semanticlookup.zbmed.de/	ZB MED		service	Ontology Lookup Service (OLS)
NFDI4Biodiversity	GFBio Terminology Service	https://terminologies.gfbio.org	InfAI		service	own dev, planned ontportal technology
NDFI4Objects	DANTE	https://api.dante.gbv.de	VZG		service	own dev, compatible with JSKOS-Server
NDFI4Objects	coli-conc KOS registry	https://coli-conc.gbv.de/api/	VZG		service	JSKOS Server
NDFI4Chem	NFDI4Chem Terminology Service	https://terminology.nfdi4chem.de/	TIB		service	Ontology Lookup Service (OLS)
NFDI4Ing	NFDI4Ing Terminology Service	https://terminology.nfdi4ing.de/ts4ing/in	TIB		service	Ontology Lookup Service (OLS)
DataPLANT	SwateOntology DB / Swobup	https://github.com/nfdi4plants/Swobup	?		?	own dev
GHGA						
KonsortSWD	Thesaurus for the Social Sciences TheSoz	https://lod.gesis.org/de/	GESIS		service	Skosmos
KonsortSWD	CESSDA Vocabulary Service	https://vocabularies.cessda.eu/	CESSDA Main Office		service	own dev
KonsortSWD	Metadata and Vocabulary Verbund FDB (Metadata Redigstry, MDR)	https://mdr.iqb.hu-berlin.de/#/catalog	IQB Berlin für Verbund Fors	Lisa Pegelov	service	
NFDI4Cat		https://nfdi4cat.org/services/ontologie-s	DECHEMA		registry	own dev
NFDI4Culture	GND (as terminology backbone)	https://gnd.network	DNB / GND Cooperative		service	
Text+	GND (as terminology backbone)	https://gnd.network	DNB / GND Cooperative		service	
BERD@NFDI	-					
DAPHNE4NFDI						
FAIRmat	NOMAD Metainfo	https://nomad-lab.eu/prod/v1/gui/analyze	HUB	Luca Ghiring	registry	own dev
FAIRmat	NOMAD Laboratory	https://nomad-lab.eu/prod/v1/gui/about	HUB	Markus Sche	service	own dev
MaRDI						
NFDI4DataScience						
NFDI4Earth	NERC Vocabulary Server (NVS)	https://vocab.nerc.ac.uk/	National Oceanography Centre - British		service	own dev
NFDI4Earth	BARTOC Skosmos	https://bartoc-skosmos.unibas.ch/	not maintained anymore, may be move t		service	Skosmos
NFDI4Microbiota						
NFDI-MatWerk						
PUNCH4NFDI						
NFDI4Health	OntoServer	https://terminology-highmed.medic.mcg	Maybe Faculty of Medicine at University		service	CSIRO Ontoserver
NFDI4Health	Snowstorm		?		service	IHTSDO Snowstorm
NFDI4Health	LOINC	https://loinc.org/fhir/	Regenstrief Institute		service	?

Aktuelle Situation - NFDI

Terminologiedienste – Evaluierung der aktuellen Situation

consortia	name of service or registry	URL	service maintainer	contact	type	Software used
NFDI4Health	SemLookP	https://semanticlookup.zbmed.de/	ZB MED		service	Ontology Lookup Service (OLS)
NFDI4Biodiversity	GFBio Terminology Service	https://terminologies.gfbio.org	InfAI		service	own dev, planned ontportal technology
NDFI4Objects	DANTE	https://api.dante.gbv.de	VZG		service	own dev, compatible with JSKOS-Server
NDFI4Objects	coli-conc KOS registry	https://coli-conc.gbv.de/api/	VZG		service	JSKOS Server
NFDI4Chem	NFDI4Chem Terminology Service	https://terminology.nfdi4chem.de/	TIB		service	Ontology Lookup Service (OLS)
NFDI4						
DataPL						
GHGA						
Konsor						
Konsor						
Konsor						
NFDI4C						
NFDI4C						
Text+						
BERDc						
DAPHN						
FAIRm						
FAIRm						
MaRDI						
NFDI4C						
NFDI4E						
NFDI4Earth	BARTOC Skosmos	https://bartoc-skosmos.unibas.ch/	not maintained anymore, may be move to		service	Skosmos
NFDI4Microbiota						
NFDI-MatWerk						
PUNCH4NFDI						
NFDI4Health	OntoServer	https://terminology-highmed.medic.mcg	Maybe Faculty of Medicine at University		service	CSIRO Ontoserver
NFDI4Health	Snowstorm		?		service	IHTSDO Snowstorm
NFDI4Health	LOINC	https://loinc.org/fhir/	Regenstrief Institute		service	?

Überblick

- ▶ Unterschiedliche Tools in unterschiedlichen Konsortien
- ▶ Unterschiedliche Tools im gleichen Konsortium
- ▶ Gleiche Tools in unterschiedlichen Konsortien

Aktuelle Situation - SemLookP

SEMLOOKP
Terminology Service for NFDI4Health

Home Resources About Use Cases Projects Contact

Welcome to the Terminology Service

Search the Terminology Service...

Examples: [diabetes](#), [GO:0098743](#) [Looking for a particular resource?](#)

About the Terminology Service

The Terminology Service is a repository for biomedical resources that aims to provide a single point of access to the latest ontology and terminology versions. The preliminary health terminology set of the BMBF-funded project [IDSN](#) was extended by [NFDI4Health](#) relevant resources.

You can browse the resources through the website as well as programmatically via our API. The API of SemLookP is integrated into other web services for example the [ZB MED preprint viewer preVIEW](#).

It is part of the Semantic Lookup Platform, which is developed and maintained by ZB MED - Information Centre for Life Sciences.

Data Content
Updated 21 Nov 2022 21:28

- 34 ontologies and terminologies
- 4,579,893 terms
- 4,536 properties
- 1,624,338 individuals
- Version 3.2.1-SNAPSHOT

Use Cases

- [preVIEW](#)

Aktuelle Situation - SemLookP

SEMLOOKP
Terminology Service for NFDI4Health

Home Resources About Use Cases Projects Contact

Welcome to the Terminology Service

Search the Terminology Service...

Examples: [diabetes](#), [GO:0098743](#) [Looking for a particular resource?](#)

Data Content
Updated 21 Nov 2022 21:28

- 34 ontologies and terminologies
- 4,579,893 terms
- 4,536 properties
- 1,624,338 individuals
- Version 3.2.1-SNAPSHOT

Use Cases

- [preVIEW](#)

About the Terminology Service

The Terminology Service is a repository for biomedical resources that aims to provide a single point of access to the latest ontology and terminology versions. The preliminary health terminology set of the BMBF-funded project [IDSN](#) was extended by [NFDI4Health](#) relevant resources.

You can browse the resources through the website as well as programmatically via our API. The API of SemLookP is integrated into other web services for example the ZB MED preprint viewer [preVIEW](#).

It is part of the Semantic Lookup Platform, which is developed and maintained by ZB MED - Information Centre for Life Sciences.

► Accessible via: <https://semanticlookup.zbmed.de/>

Aktuelle Situation - SemLookP

Einschränkungen: Ontology Lookup Service (OLS) + Oxo

- ▶ nicht multilingual – ohne Änderungen wird nur Englisch unterstützt

Aktuelle Situation - SemLookP

Einschränkungen: Ontology Lookup Service (OLS) + Oxo

- ▶ nicht multilingual – ohne Änderungen wird nur Englisch unterstützt
- ▶ Kein verteiltes System

Aktuelle Situation - SemLookP

Einschränkungen: Ontology Lookup Service (OLS) + Oxo

- ▶ nicht multilingual – ohne Änderungen wird nur Englisch unterstützt
- ▶ Kein verteiltes System
 - ▶ no fall back Lösung- 24/7?

Aktuelle Situation - SemLookP

Einschränkungen: Ontology Lookup Service (OLS) + Oxo

- ▶ nicht multilingual – ohne Änderungen wird nur Englisch unterstützt
- ▶ Kein verteiltes System
 - ▶ no fall back Lösung- 24/7?
- ▶ Keine Versionierung von Ontologien

Was ist eine Lösung für die Einschränkungen?

Aktuelle Situation - SemLookP

Einschränkungen: Ontology Lookup Service (OLS) + Oxo

- ▶ nicht multilingual – ohne Änderungen wird nur Englisch unterstützt
- ▶ Kein verteiltes System
 - ▶ no fall back Lösung- 24/7?
- ▶ Keine Versionierung von Ontologien

Was ist eine Lösung für die Einschränkungen?

- ▶ Information der Ontologien sind über die JSON API verfügbar

Aktuelle Situation - SemLookP

Einschränkungen: Ontology Lookup Service (OLS) + Oxo

- ▶ nicht multilingual – ohne Änderungen wird nur Englisch unterstützt
- ▶ Kein verteiltes System
 - ▶ no fall back Lösung- 24/7?
- ▶ Keine Versionierung von Ontologien

Was ist eine Lösung für die Einschränkungen?

- ▶ Information der Ontologien sind über die JSON API verfügbar
- ▶ Erstellen eines eigenständigen Frontends, dass die Daten über JSON APIs erhält

Aktuelle Situation - SemLookP

▶ backend



▶ frontend

SEMLOOKP
Terminology Service for NFDI4Health

Home Resources About Use Cases Projects Contact

Welcome to the Terminology Service

Search the Terminology Service...

Examples: [diabetes](#), [GO:0098743](#) [Looking for a particular resource?](#)

Data Content
Updated 21 Nov 2022 21:28

- 34 ontologies and terminologies
- 4,579,893 terms
- 4,536 properties
- 1,624,338 individuals
- Version 3.2.1-SNAPSHOT

Use Cases

- [preVIEW](#)

About the Terminology Service

The Terminology Service is a repository for biomedical resources that aims to provide a single point of access to the latest ontology and terminology versions. The preliminary health terminology set of the BMBF-funded project IDSN was extended by NFDI4Health relevant resources.

You can browse the resources through the website as well as programmatically via our API. The API of SemLookP is integrated into other web services for example the ZB MED preprint viewer [preVIEW](#).

It is part of the Semantic Lookup Platform, which is developed and maintained by ZB MED - Information Centre for Life Sciences.

▶ one instance

▶ one instance

Aktuelle Situation - SemLookP

Erweiterung von Ontology Lookup Service (OLS) + Oxo

- ▶ Erstellen eines eigenständigen Frontends, das die Daten über JSON APIs erhält

Vorteile

- ▶ Unabhängig von Änderungen im OLS core System, wenn es keine Änderungen in der Struktur des JSON gibt
- ▶ Es werden weiterhin die gleichen Daten und Standards wie im Originalsystem bereitgestellt, aber es ist möglich die Funktionalität zu erweitern indem man multiplen Instanzen zur gleichen Zeit betreibt

Aktuelle Situation - SemLookP

▶ backend



▶ eine Instanz

Aktuelle Situation - SemLookP

▶ backend

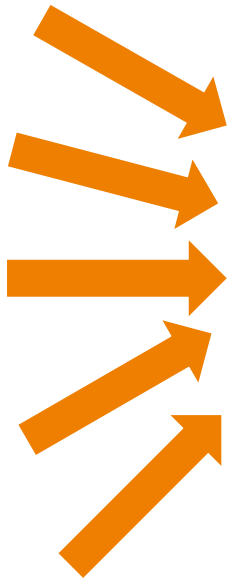
OLS
OLS
OLS
OLS
OLS

▶ multiple Instanzen

Aktuelle Situation - SemLookP

▶ backend

OLS
OLS
OLS
OLS
OLS



▶ API gateway

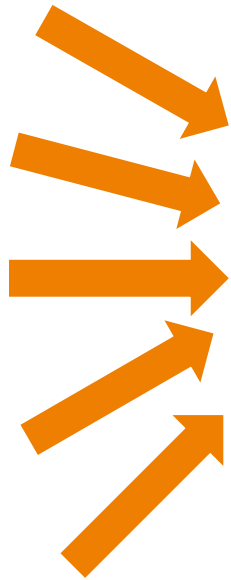
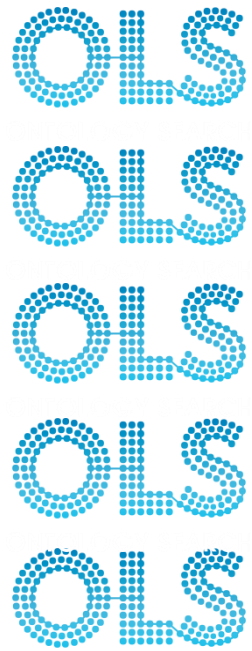


▶ multiple Instanzen

▶ eine Instanz

Aktuelle Situation - SemLookP

▶ backend



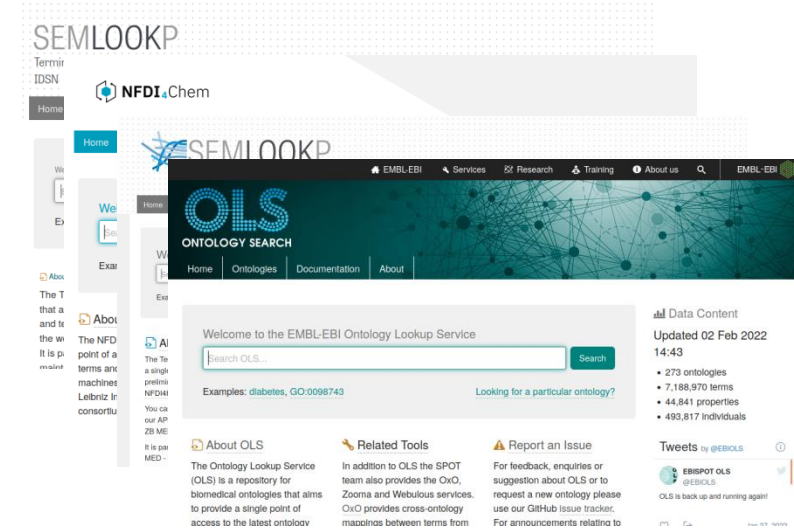
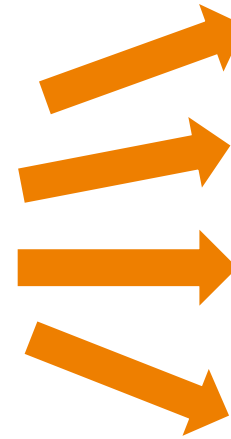
▶ multiple Instanzen

▶ API gateway



▶ eine Instanz

▶ frontend



▶ multiple Instanzen

Aktuelle Situation - SemLookP

Welcome to the Terminology Service SemLookP

The following input field provides an autocomplete functionality. It could handle for example a term (e.g. "diabetes"), a short form (e.g. "GO:0098743") and even an IRI (e.g. <http://snomed.info/id/423701002>)

By selecting an option you will be forwarded to an overview page of the selected term, property or individual.

Jump to a Term, Individual or property ▼

Next to this short cut via the autocomplete input field there is the possibility to use a search with filter functionality. To access this search you could click on **Search** in the menu bar.

Looking for a certain terminology?

[Please use our terminology overview](#)

You could also use one of our examples: [diabetes](#), [GO:0098743](#)

Data Content

Updated 22.11.2022, 21:21:27

- 32 ontologies and terminologies
- 4.579.741 terms
- 4.126 properties
- 577.812 Individuals

About the Terminology Service

The Terminology Service is a repository for biomedical resources that aims to provide a single point of access to the latest ontology and terminology versions. The preliminary health terminology set of the BMBF-funded project [IDSN](#) was extended by [NFDI4Health](#) relevant resources.

You can browse the resources through the website as well as programmatically via our API. The API of SemLookP is integrated into other web services for example the ZB MED preprint viewer [preVIEW](#) [↗](#).

It is part of the Semantic Lookup Platform, which is developed and maintained by ZB MED - Information Centre for Life Sciences.

Aktuelle Situation - SemLookP - Widgets

The screenshot displays the Storybook interface for SemLookP widgets. On the left, a sidebar lists various widget types, with 'With Defaults' selected. The main canvas shows search results for the term 'diabetes', listing several medical terms with their corresponding ontology codes (EFO or MESH) and IDs. Below the search results, a 'Controls (5)' panel is visible, showing configuration options for the 'api' control.

Name	Control
api*	<input type="radio"/> https://www.ebi.ac.uk/ols/api/ <input checked="" type="radio"/> https://semanticlookup.zbmed.de/ols/api/ <input type="radio"/> https://semanticlookup.zbmed.de/api/
frontend	nfdi4health
parameter	ontology=mesh,efo&type=class
selectionChangedEvent*	-
selectOption	Set object

▶ Accessible via: <http://km.pages.gitlab.zbmed.de/semlookup/widgets-semlookup/>

Aktuelle Situation - preVIEW

- ▶ preprint viewer for COVID-19 related articles
- ▶ contains automated annotations
- ▶ provide semantic concept search functionality
- ▶ access:
<https://preview.zbmed.de>

preVIEW: COVID-19 ABOUT TUTORIAL CONTACT

The ZB MED preprint Viewer preVIEW: COVID-19 includes 44.221 COVID-19 related preprints from medRxiv (15.091) and bioRxiv (5.264) [↗](#), ChemRxiv (275) [↗](#), ResearchSquare (8.274) [↗](#), arXiv (5.892) [↗](#) and from Preprints.org (1.768) [↗](#). The service has last been updated 4 hours ago. We try to update the data on a daily basis (7am CET/CEST).
The web page can also be accessed via API.
If you use our application, please cite: [10.3233/SHTI210124](#) [↗](#) and [10.32384/jeahil17484](#) [↗](#)

Query builder Expert Search Help

Multi

Refine your search. Currently 44.221 documents are matched

Publication Date

Published Documents

Physician's Hesitancy in Treating COVID-19 Patients and Its Associated Occupational Risk Factors in Indonesia: an Online Cross-Sectional Survey

Authors: Dewi Sumaryani Soemarko, Aria Kekalith, Ari Fahrial Syam, Evy Yuniastuti, Herikurniawan Herikurniawan, Mikhael Yosla

enable feedback ...

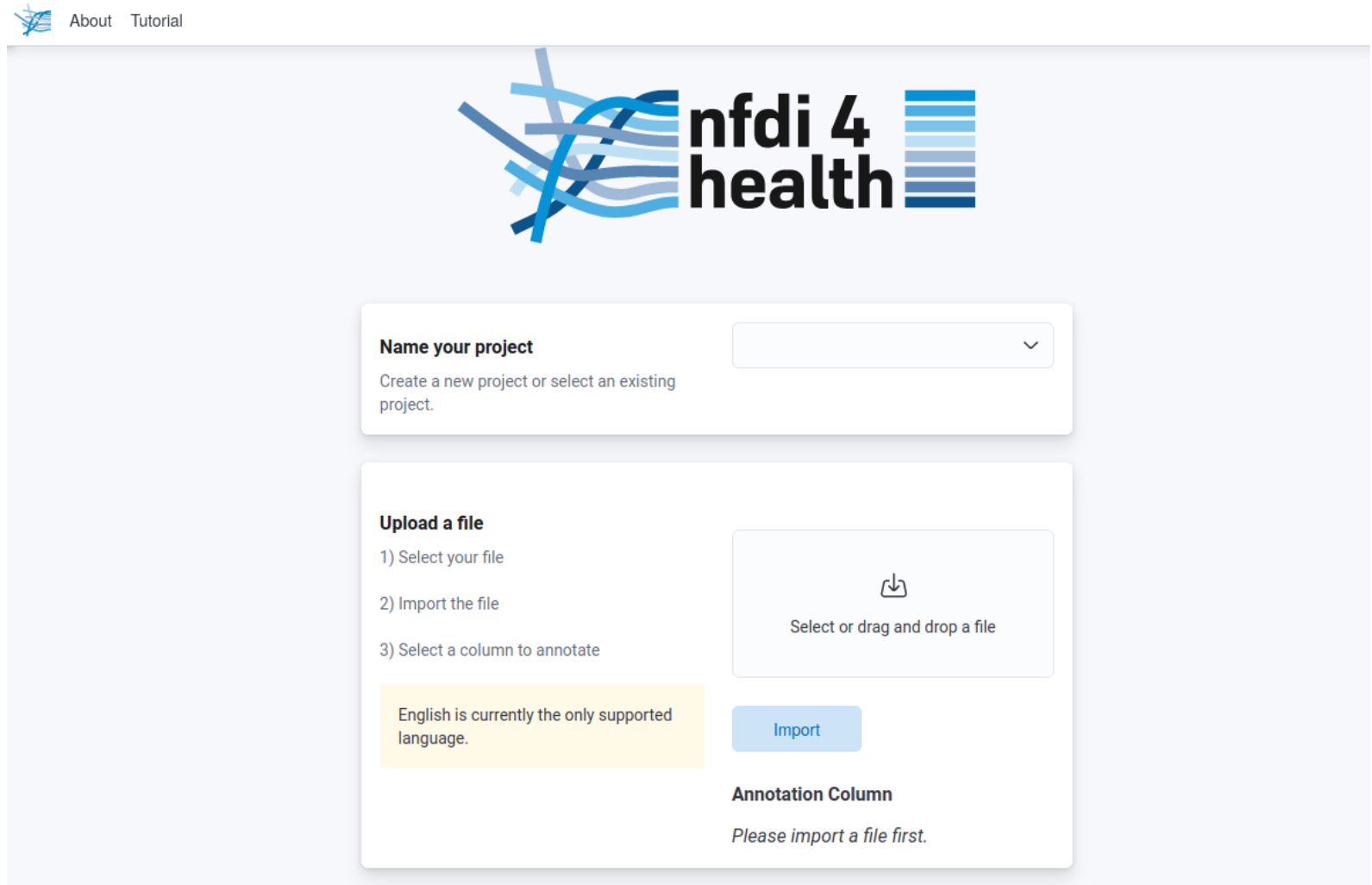
Expand all abstracts

Highlight semantic concepts

Medical Subject Headings Diseases

Aktuelle Situation - Metadata Annotation Workbench

- ▶ semantic metadata enrichment of :
 - ▶ data dictionaries
 - ▶ questionnaires
 - ▶ other data collection instruments
- ▶ access:
<https://mda.nfdi4health.de/>



About Tutorial

nfdi 4 health

Name your project

Create a new project or select an existing project.

Upload a file

1) Select your file

2) Import the file

3) Select a column to annotate

Select or drag and drop a file

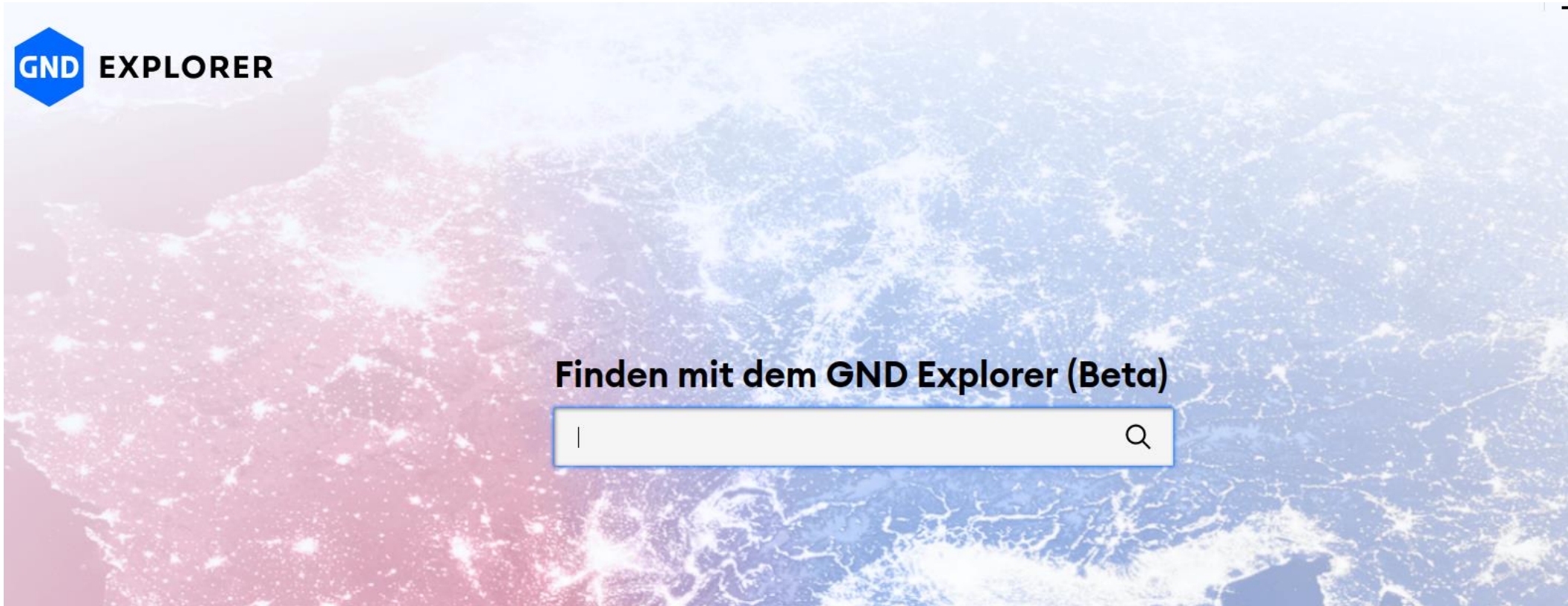
English is currently the only supported language.

Import

Annotation Column

Please import a file first.

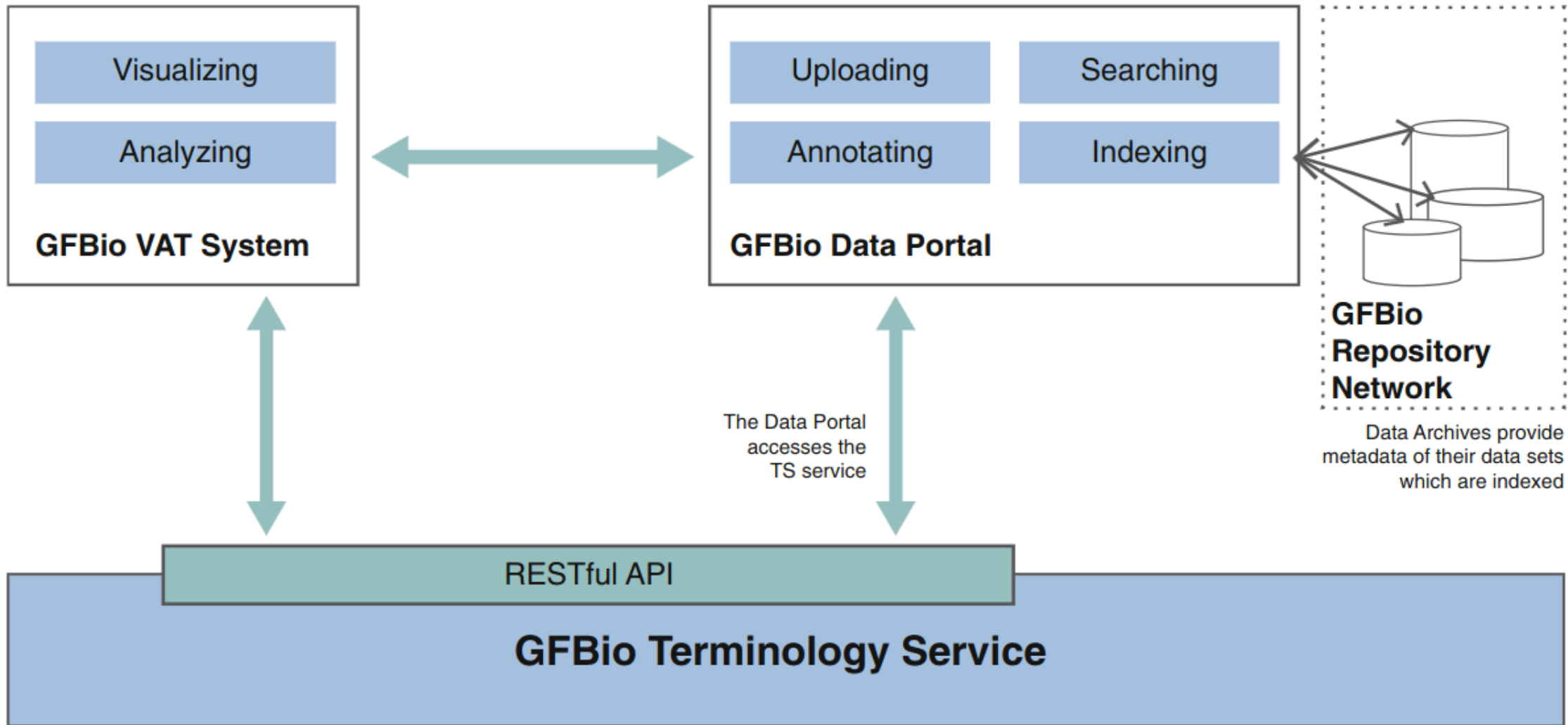
Aktuelle Situation – weitere Beispiele



Aktuelle Situation – weitere Beispiele

- ▶ GND Explorer (Text+)
 - ▶ Erreichbar: <https://explore.gnd.network/>

Aktuelle Situation – weitere Beispiele



Aktuelle Situation – weitere Beispiele

About ▾ Services ▾ Infothek ▾ Events GFBio e.V. NFDI 4 Bio ☑ Sign Up Sign In

gfbio
GERMAN FEDERATION
FOR BIOLOGICAL DATA

FAIR • Research • Data
Biodiversity, Ecology & Environmental Studies

Enter a search term ... Find Data

▶ WHY BE PART OF GFBIO ?

Environmental & ecological data

Biodiversity & collection data

Plan Submit Visualize

Aktuelle Situation – weitere Beispiele

- ▶ GND Explorer (Text+)
 - ▶ Erreichbar: <https://explore.gnd.network/>
- ▶ GF BIO Data Portal (NFDI4Biodiversity)
 - ▶ Erreichbar: <https://www.gfbio.org/>

Aktuelle Situation – weitere Beispiele



Antelope is a free, open source service to support your data annotation.
It offers terminology search, entity recognition, and easy integration into your projects.

Terminology search

Entity recognition

Integration

Type the term you want to search for (single word or phrase): [?](#)

Select terminology sources: [?](#)

- WIKIDATA
- WIKIDATA + DBpedia
- ICONCLASS

RUN SERVICE **RESET**

Aktuelle Situation – weitere Beispiele

- ▶ GND Explorer (Text+)
 - ▶ Erreichbar: <https://explore.gnd.network/>
- ▶ GF BIO Data Portal (NFDI4Biodiversity)
 - ▶ Erreichbar: <https://www.gfbio.org/>
- ▶ Antelope (NFDI4Culture)
 - ▶ Erreichbar: <https://service.tib.eu/annotation/>

Aktuelle Situation – weitere Beispiele

Metadata Annotation

Metadata for resource: 61332970-edd7-45ba-94f5-5b7de6841f24

Descriptive Metadata

Research Metadata

File Metadata

Current status: In progress

Save

Validate

BiodatenMinimal

Studied object/sample: material entity from which the data was derived [Remove](#)

unique identifier of the studied object/sample (autogenerated)

1

description of the studied object/sample

add free text (e.g., Arabidopsis thaliana)

type of the studied object/sample

Organism (i.e., eukaryota, bacteria, archaea) ▼

Aktuelle Situation – weitere Beispiele

- ▶ GND Explorer (Text+)
 - ▶ Erreichbar: <https://explore.gnd.network/>
- ▶ GF BIO Data Portal (NFDI4Biodiversity)
 - ▶ Erreichbar: <https://www.gfbio.org/>
- ▶ Antelope (NFDI4Culture)
 - ▶ Erreichbar: <https://service.tib.eu/annotation/>
- ▶ BioDATEN
 - ▶ In Vorbereitung

Aktuelle Situation – weitere Beispiele

- ▶ GND Explorer (Text+)
 - ▶ Erreichbar: <https://explore.gnd.network/>

- ▶ GF BIO Data Portal (NFDI4Biodiversity)

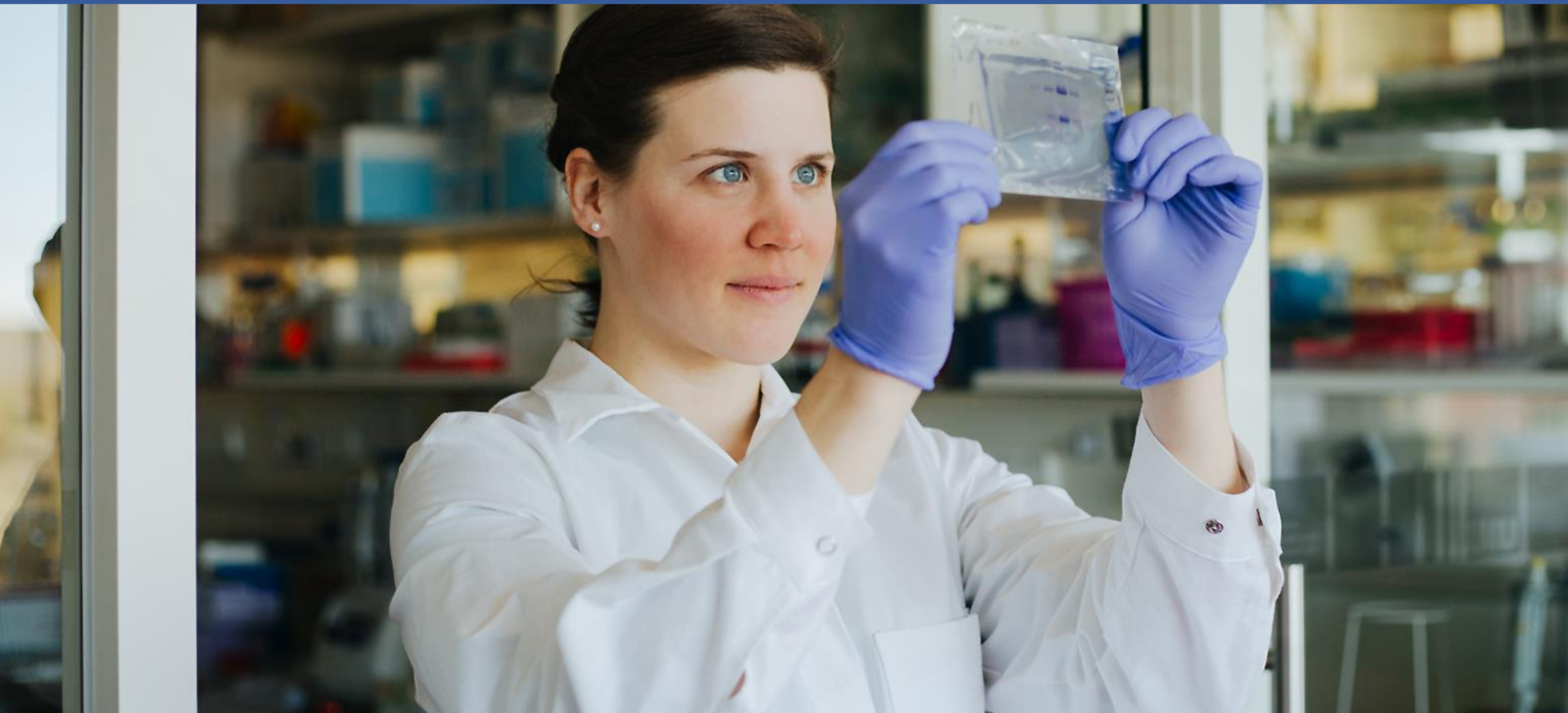
- ▶ Erreichbar: **Überblick über Terminologiedienste**

- ▶ Antelope (NFDI4Bioinformatics)
 - ▶ BARTOC

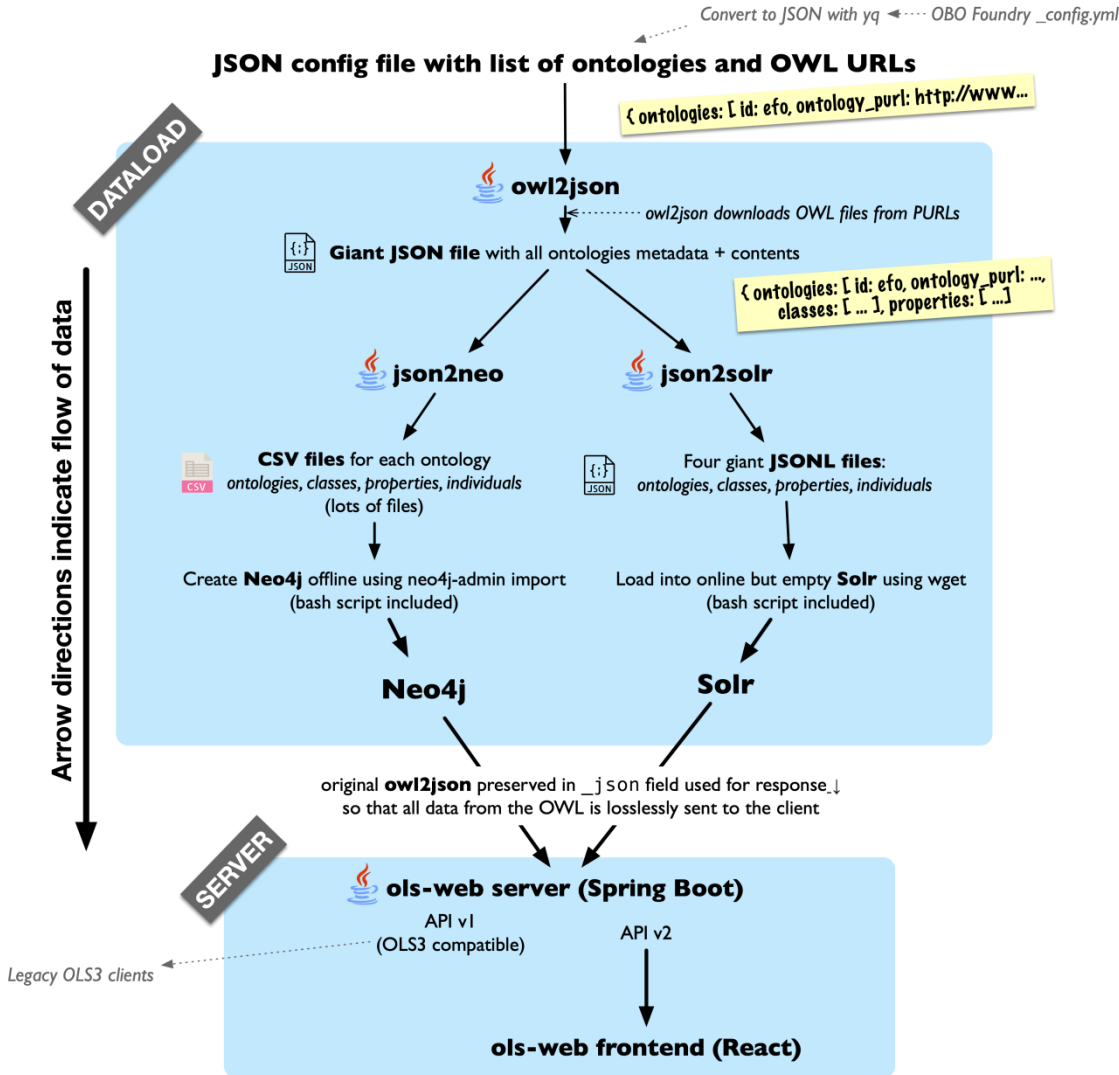
- ▶ Erreichbar:
 - ▶ Terminologieregistry

- ▶ BioDATEN
 - ▶ Erreichbar: <https://bartoc.org/registries>

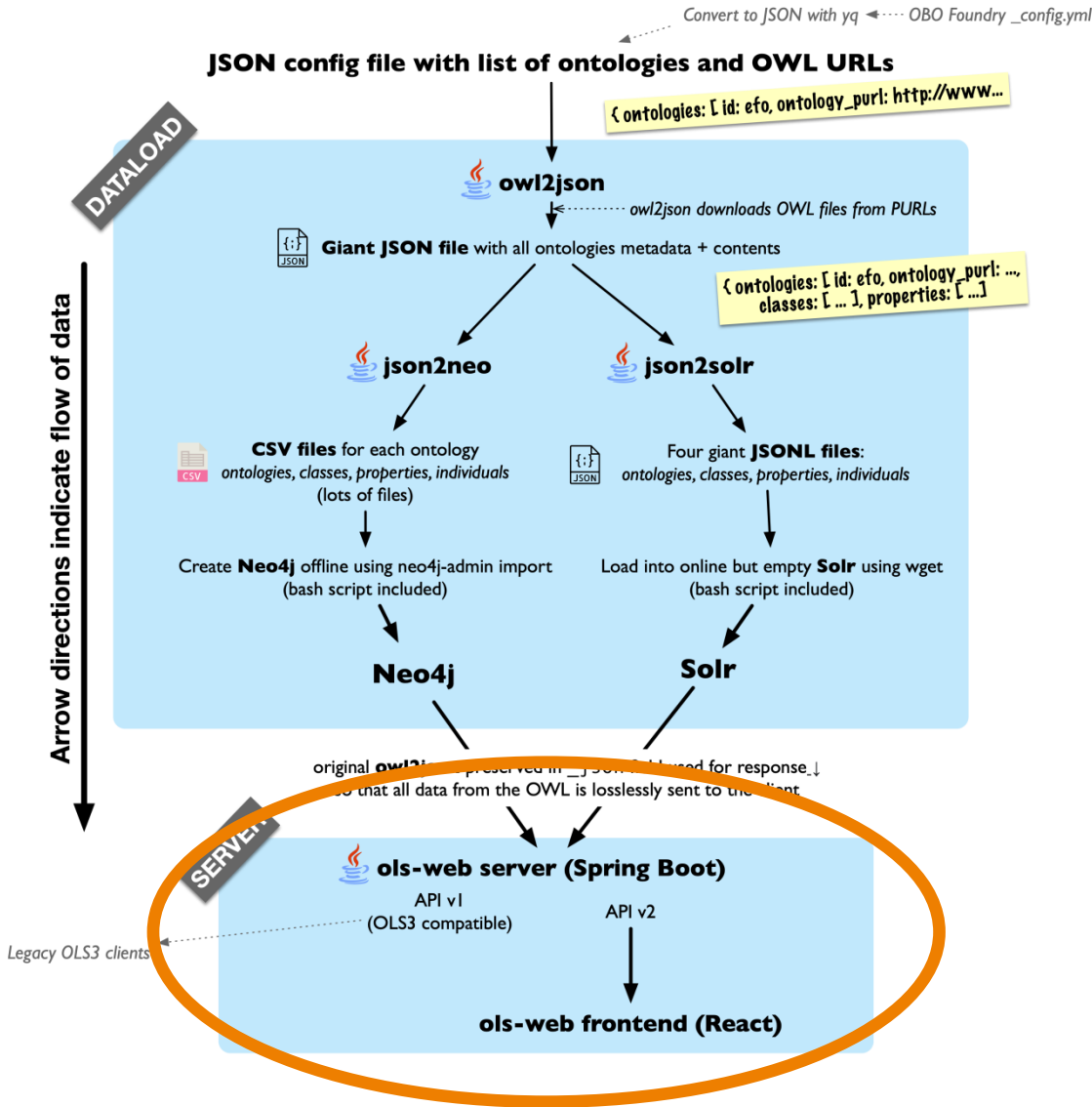
- ▶ In Vorbereitung



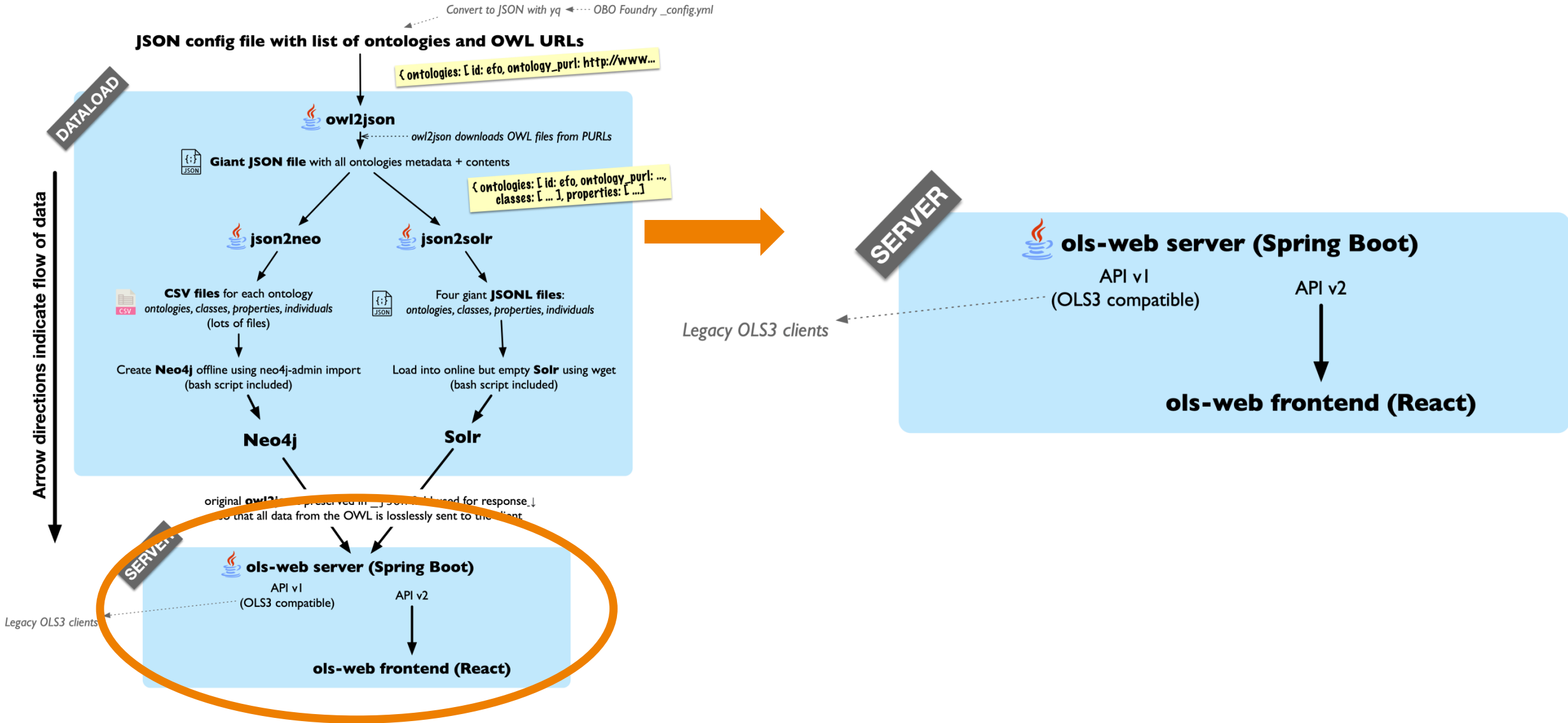
Ausblick - SemLookP



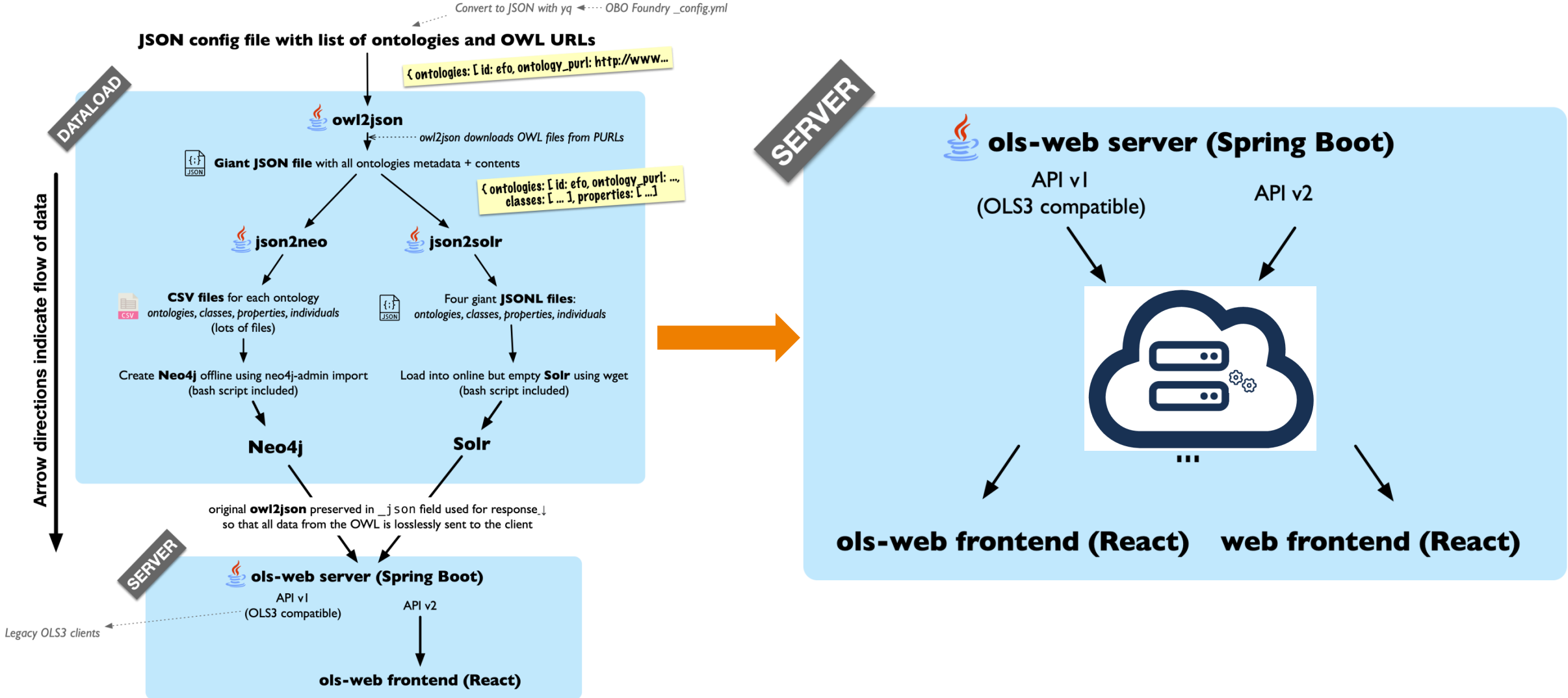
Ausblick - SemLookP



Ausblick - SemLookP

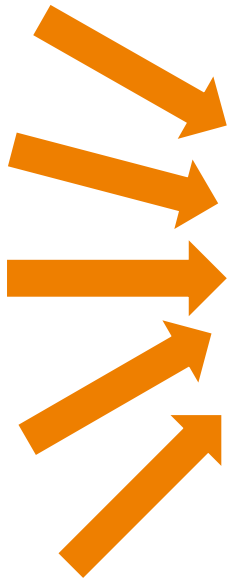
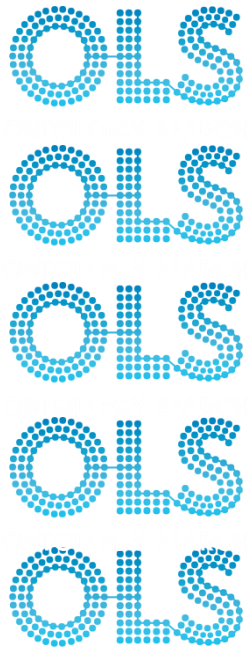


Ausblick - SemLookP



Ausblick – NFDI

▶ backend



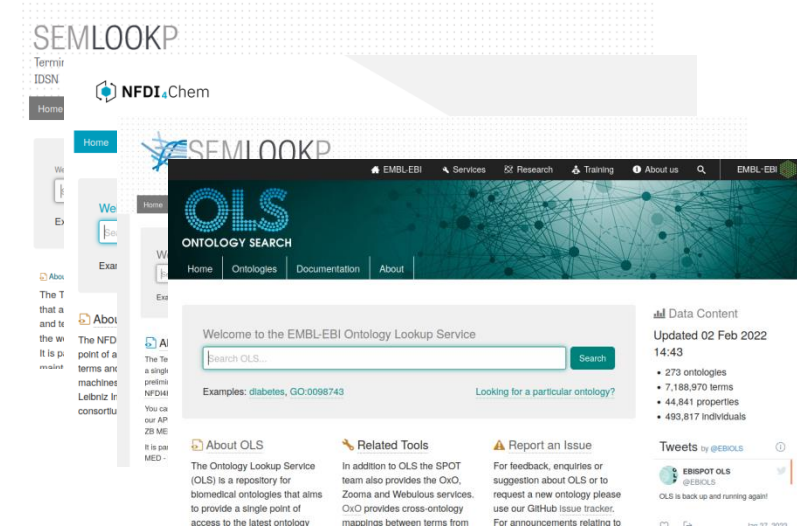
▶ multiple Instanzen

▶ API gateway



▶ eine Instanz

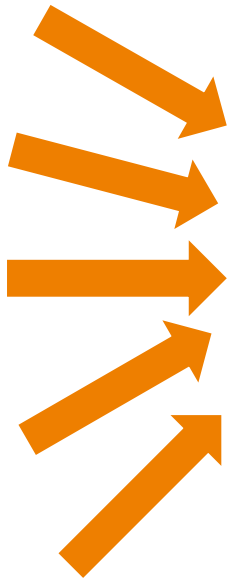
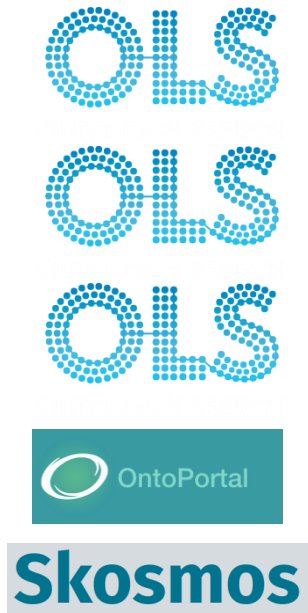
▶ frontend



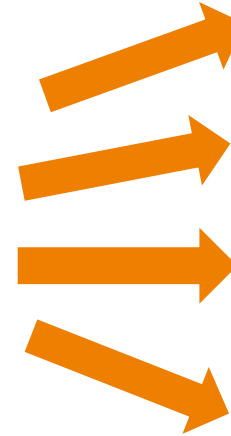
▶ multiple Instanzen

Ausblick – NFDI

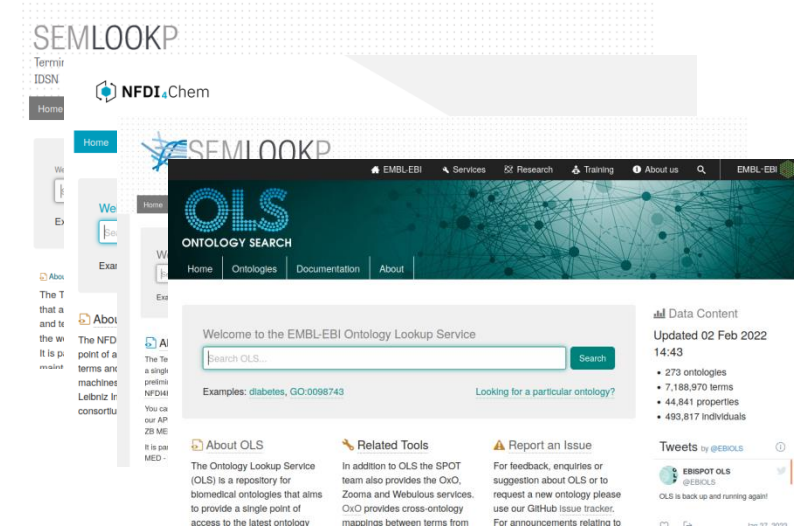
▶ backend



▶ API gateway



▶ frontend



▶ multiple Instanzen

▶ eine Instanz

▶ multiple Instanzen

Thanks!



www.zbmed.de

For further information just contact me.

Roman Baum

scientific software developer

PB Wissensmanagement

ZB MED

Katzenburgweg 1a

53115 Bonn

baum@zbmed.de

<https://orcid.org/0000-0001-5246-9351>

<https://www.researchgate.net/profile/Roman-Baum>