

RIKEN MetaDatabase

This database portal site is used to provide information on RIKEN's various life science databases to order to help researchers around the world make full use of RIKEN's research results.



Databases

Ontologies

About RIKEN Meta Database

<http://metadb.riken.jp>

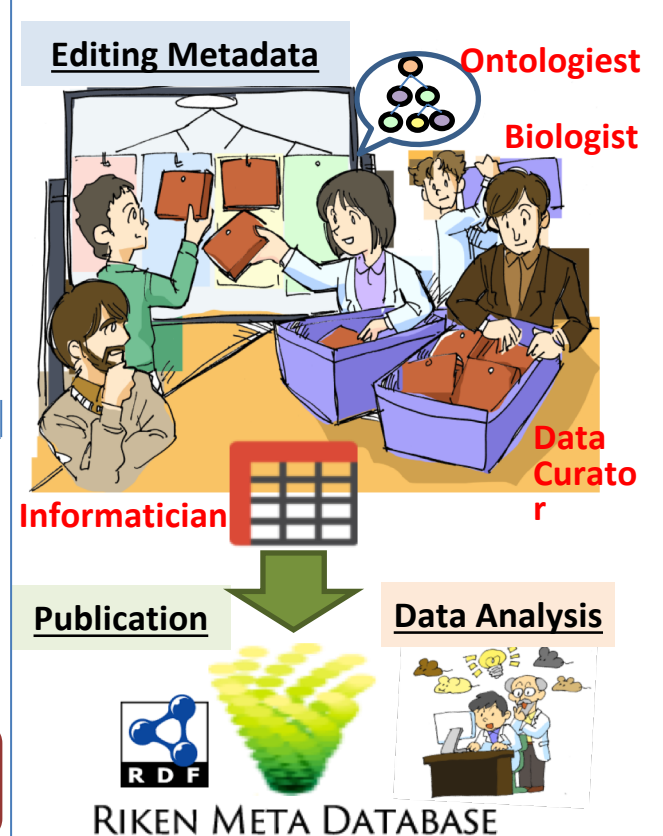
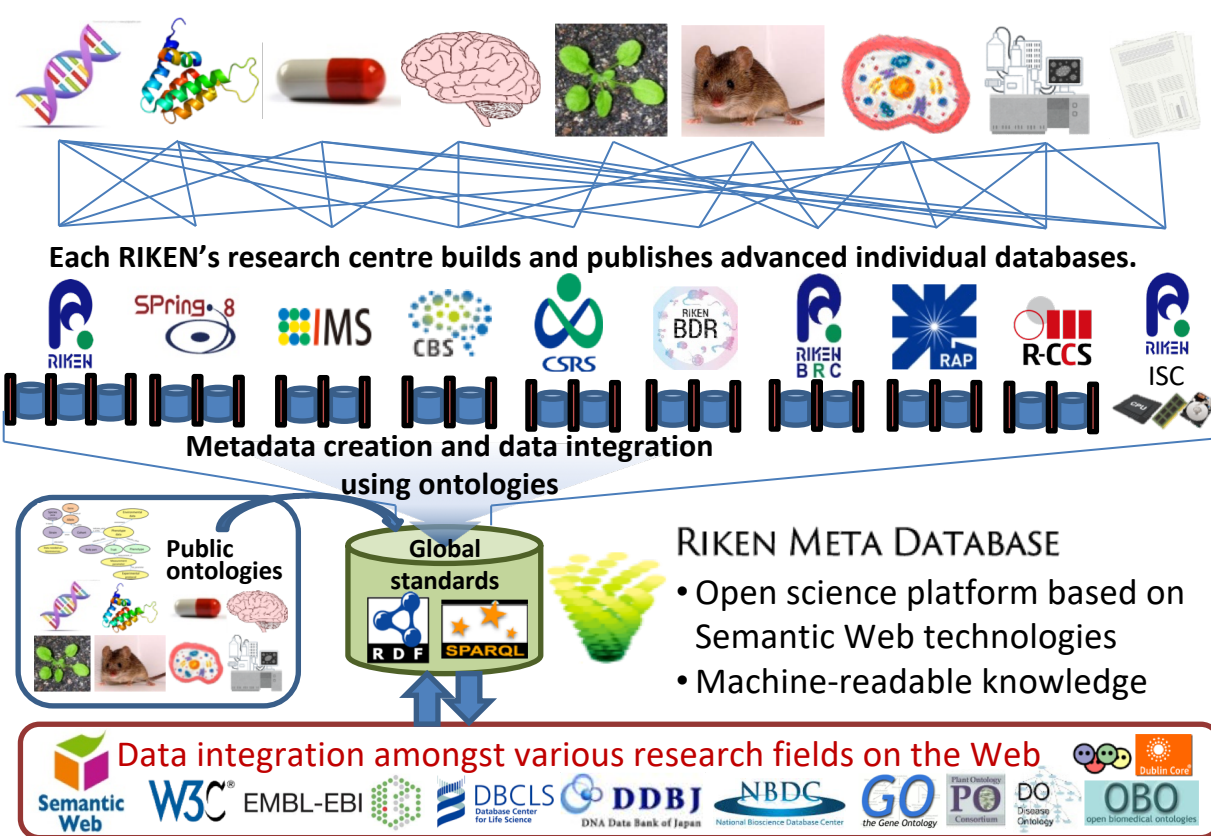
A Data Integration Platform for RIKEN's Cross-field Data-driven Researches

Norio Kobayashi

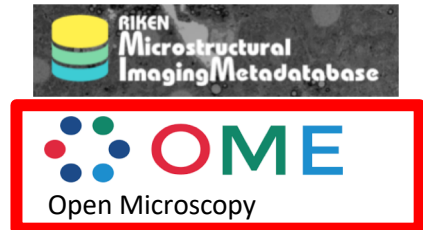
Head Office for Information Systems and Cybersecurity
(ISC)



Promote data analysis, integration and publication of RIKEN's various life-science datasets



26 public ontologies refer to RIKEN's 62 DBs and external 51 DBs (Total: 135 DBs)



# Class	2,238
# Entity	31,808,156
# Triple	161,157,663
# Property	1,271
# User per month	2,571
# Access per month	168,044

Ontology

- a formal expression of knowledge that describes **concepts and relationships between concepts in a certain domain.**
- a formal and explicit specification of conceptualisation.
- provides vocabulary used for modelling of a certain domain.

Web Ontology Language (OWL)

- a machine-readable ontology language to exchange data on the web.

<https://www.w3.org/TR/owl2-overview/>

W3C Recommendation

OWL 2 Web Ontology Language
Document Overview (Second Edition)

W3C Recommendation 11 December 2012

This version:
<http://www.w3.org/TR/2012/RFC-owl2-overview-20121211/>

Latest version (series 2):
<http://www.w3.org/TR/owl2-overview/>

Latest Recommendation:
<http://www.w3.org/TR/owl-overview>

Previous version:
<http://www.w3.org/TR/2012/PER-owl2-overview-20121018/>

Editors:
W3C OWL Working Group (see [Acknowledgements](#))

<https://bioportal.bioontology.org/>

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

Search for a class

Find an ontology

Browse Ontologies

BioPortal Statistics

Ontologies	711
Classes	9,198,663
Resources Indexed	98
Indexed Records	39,537,360
Direct Annotations	95,468,433,792

Ontologies 711
Classes 9,198,663

Integrated databases

- [RIKEN Database Directory](#)

Mammalian

- [FANTOM5 SSTAR](#)
- [FANTOM4](#)
- [FANTOM eeDB](#)
- [Metadata of BRC mouse resources and phenotypes](#)
- [Metadata of BRC cell resources](#)
- [The RIKEN integrated database of mammals](#)
- [NBRP Medaka Phenotype Metadata](#)
- [Metadata of NBRP Rat](#)
- [NIG Mouse Phenotype Database Metadata](#)
- [IMPC_RDF](#)
- [Metadata of Functional Glycomics with KO mice database \(beta\)](#)
- [RDF of MGI data](#)
- [NIG Zebrafish\(beta\)](#)
- [RIKEN Microstructural Imaging MetaDatabase](#)



Plant

- [FOX Hunting](#)
- [RIKEN Arabidopsis Activation tagging line](#)
- [The Rice Gene From RAP-DB](#)
- [RIKEN Plant gene family](#)
- [RIKEN Phenome Integration of Arabidopsis mutants](#)
- [RIKEN RARGE Promoter](#)
- [Gramene O.sativa GO Annotation \[Data\]](#)
- [RIKEN RARGE Transposon Mutant](#)
- [RIKEN RAFL cDNA](#)
- [RIKEN Arabidopsis Phenome Information Database](#)
- [RIKEN RARGE Alternative Splicing](#)
- [RIKEN Arabidopsis Transcription Factor database](#)
- [ARTADE2 predicted gene model database](#)



26 public ontologies refer to 113 databases:



62 databases and external 51 databases,
(total 135 databases)

Protein

- [RIKEN Protein Database](#)
- [RIKEN Harima Heavy-atom Database \[Data\]](#)
- [Bacpedia \(Riken Harima SPring8-Center\)](#)
- [Bacpedia data download project](#)
- [Pfam](#)
- [Protein Data Bank](#)



Others

- [Metadata of JCM resources](#)
- [Metadata of quantitative data and datasets of microscopy images provided from SSBD database](#)
- [SSBC \(Systems and Structural Biology Center\)](#)
- [RAPID: Resource of Primary Immunodeficiency Diseases](#)

Ontology

- [Metagenome and Microbes Environmental Ontology](#)
- [Chemical Entities of Biological Interest \(ChEBI\)](#)
- [Cell Ontology](#)
- [Gene Ontology \(GO\)](#)
- [Mouse Adult Gross Anatomy \(MA\)](#)
- [Microbial Culture Collection Vocabulary \(MCCV\)](#)
- [Medaka fish anatomy and development](#)
- [Mammalian Phenotype \(MP\)](#)
- [NCBI Organismal Classification \(NCBITaxon\)](#)
- [Phenotypic Quality \(PATO\)](#)
- [OBO-relation ontology \(RO\)](#)
- [Semanticscience Integrated Ontology](#)
- [Uber Anatomy Ontology \(UBERON \)](#)
- [Units of Measurement \(UO\)](#)
- [Zebrafish Anatomy and Development \(ZFA\)](#)

RIKEN's Cross-field Data-driven Researches

OME-based Imaging ontology development

Extended OWL model for Electron microscopy RIKEN Microstructural Imaging MetaDatabase

Image list

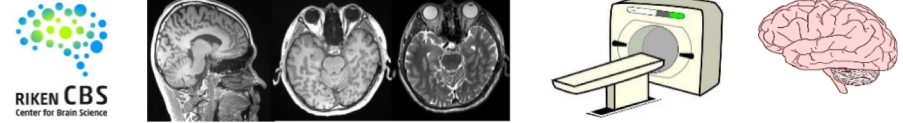
Metadata

Project	Experiment	Experimenter Group
Electron Microscopy Experiment Type		

Image Viewer (DZI image)

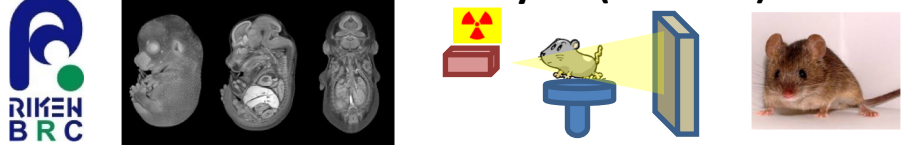
RIKEN BDR

Extended OWL model for MRI



Development of a structural and functional marmoset brain atlas by combining 9.4T MRI, tracer injection and Ca2+ imaging at RIKEN Center for Brain Science.

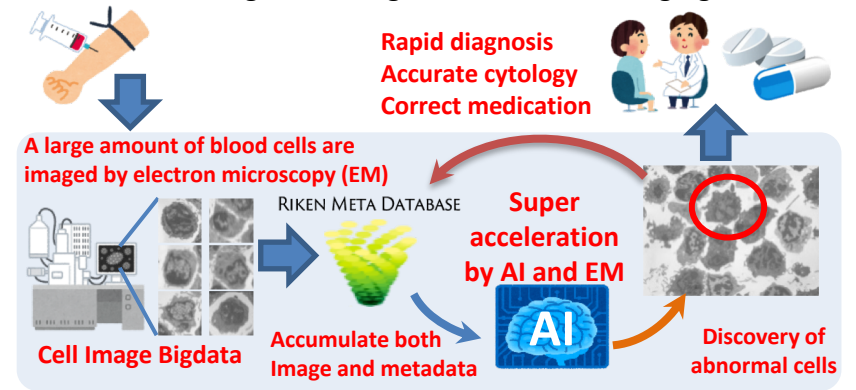
Extended OWL model for X-ray CT (microCT)



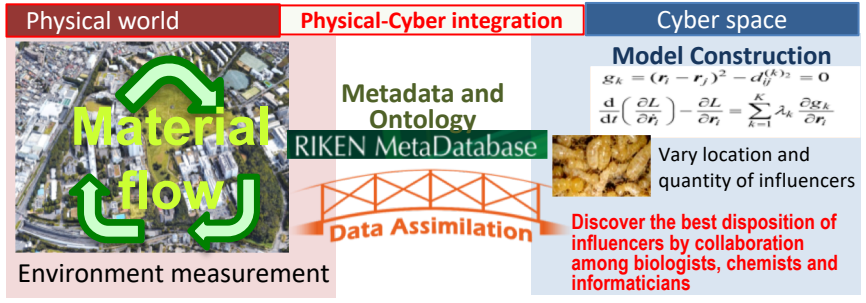
Novel phenotypic analysis method for soft tissue by X-ray CT at RIKEN BioResource Research Center.

RIKEN Engineering Network Project

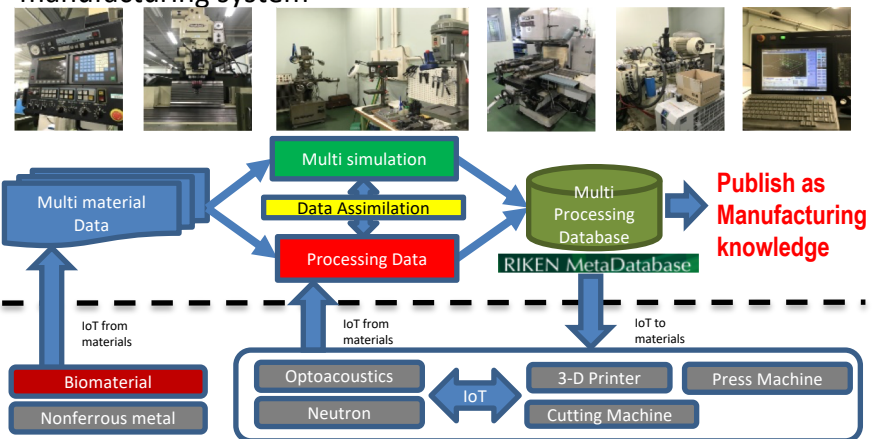
Health Care: Development of high-speed accurate cytology for leukaemia diagnosis using microstructure imaging



Sustainable Humanosphere: Toward a comprehensive solution for Sustainable Development Goals



Material and measurement: Development of a data driven manufacturing system



An ontology-based OME data model for multimodal biomedical imaging

Norio Kobayashi, et al., RIKEN

imaging

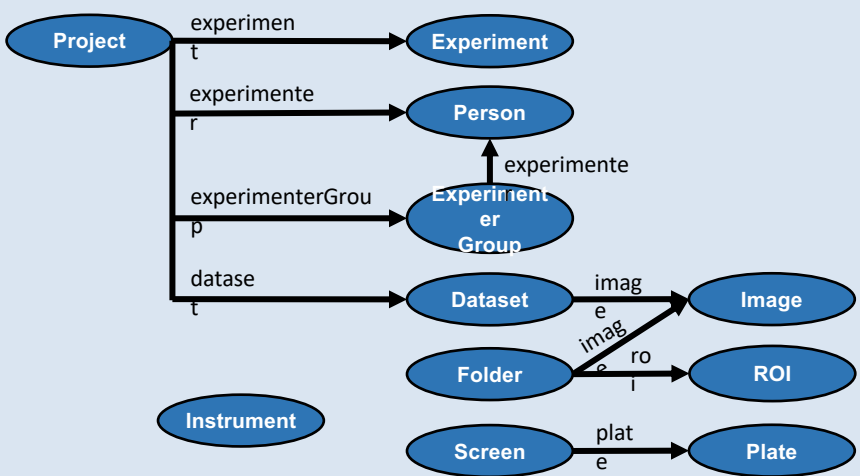
Poster, 2018 OME Annual Users Meeting

Ontology : a formal knowledge expression that describes concepts and relationships between concepts
 OWL : Web Ontology Language

↑
classes

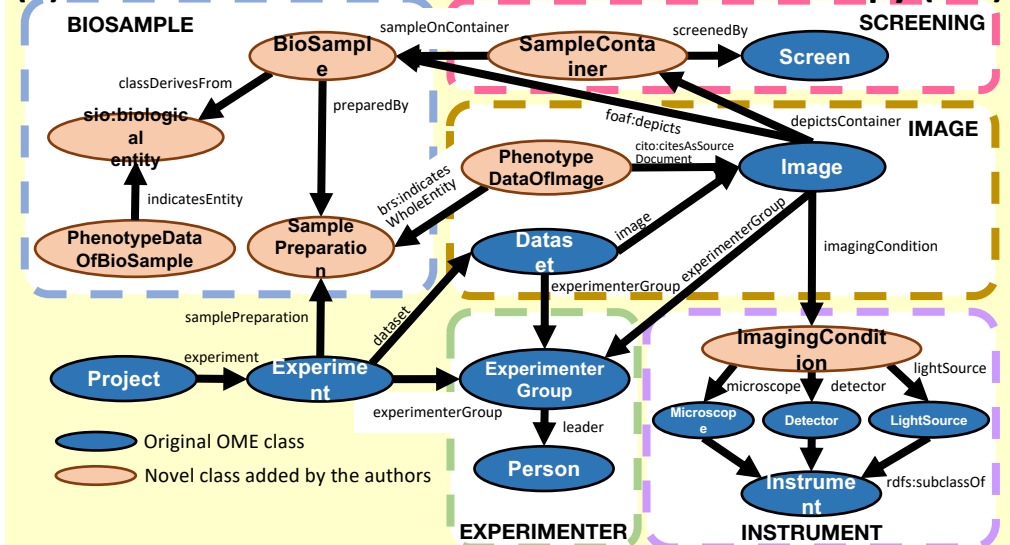
↑
properties

(1) Write the OME data model for optical microscopy (OM) in OWL (OWL model)



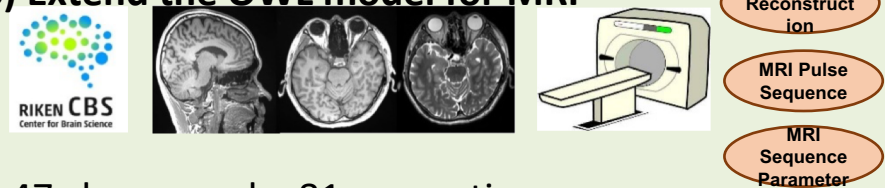
111 classes and 179 properties

(2) Extend the OWL model for electron microscopy (EM)



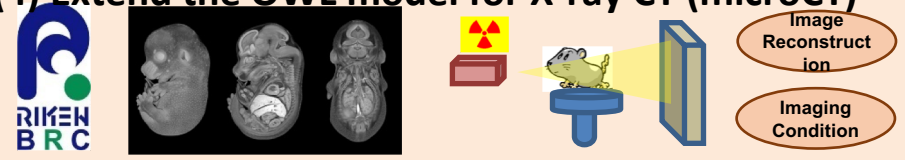
+ 212 classes and + 39 properties

(3) Extend the OWL model for MRI



+ 47 classes and + 81 properties

(4) Extend the OWL model for X-ray CT (microCT)



+ 17 classes and + 53 properties

We have developed **integrated imaging ontology (model) for OM, EM, MRI and CT** having **387 classes and 352 properties** which can be further integrated into exiting RDF datasets.

