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Development of A Metadatabase for Electron Microscopy Microstructural Imaging Data

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OME

XML-based OME metadata

+

New vocabularies

Electron microscopy (EM)

Biosample information

etc

RDF

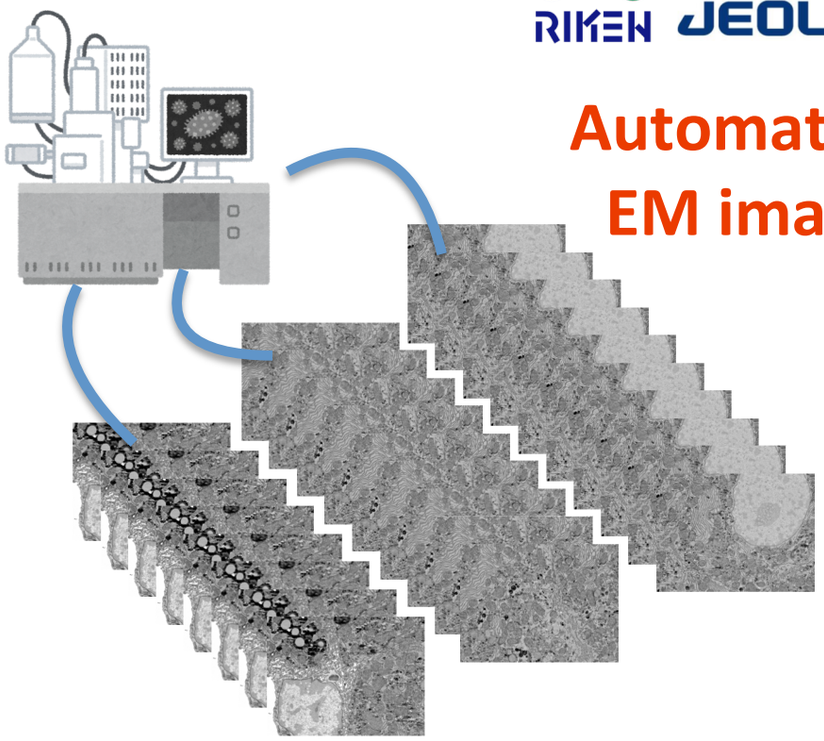
RDF/OWL-based ontology

This work was supported by JSPS A3 Foresight Program.

Wide-range EM imaging platform and its data sharing platform

New model of Scanning EM

RIKEN-JEOL Collaboration Center

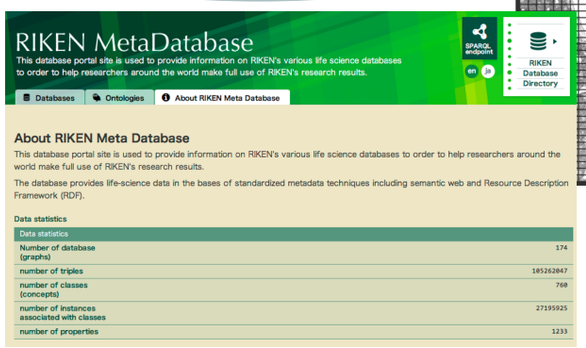


Automatic wide-range EM imaging system

- High magnifications (x3000~)
- More than 1000 images (GB scale)

Wide-range EM images “Micro-Morphome”

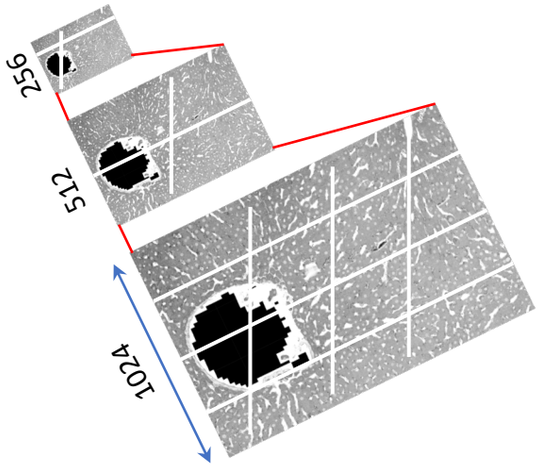
Imaging Big Data



- **Viewing the large images**
- **Publishing the data on the web**
- **Searching the data**

EM viewer equipped with the metadata

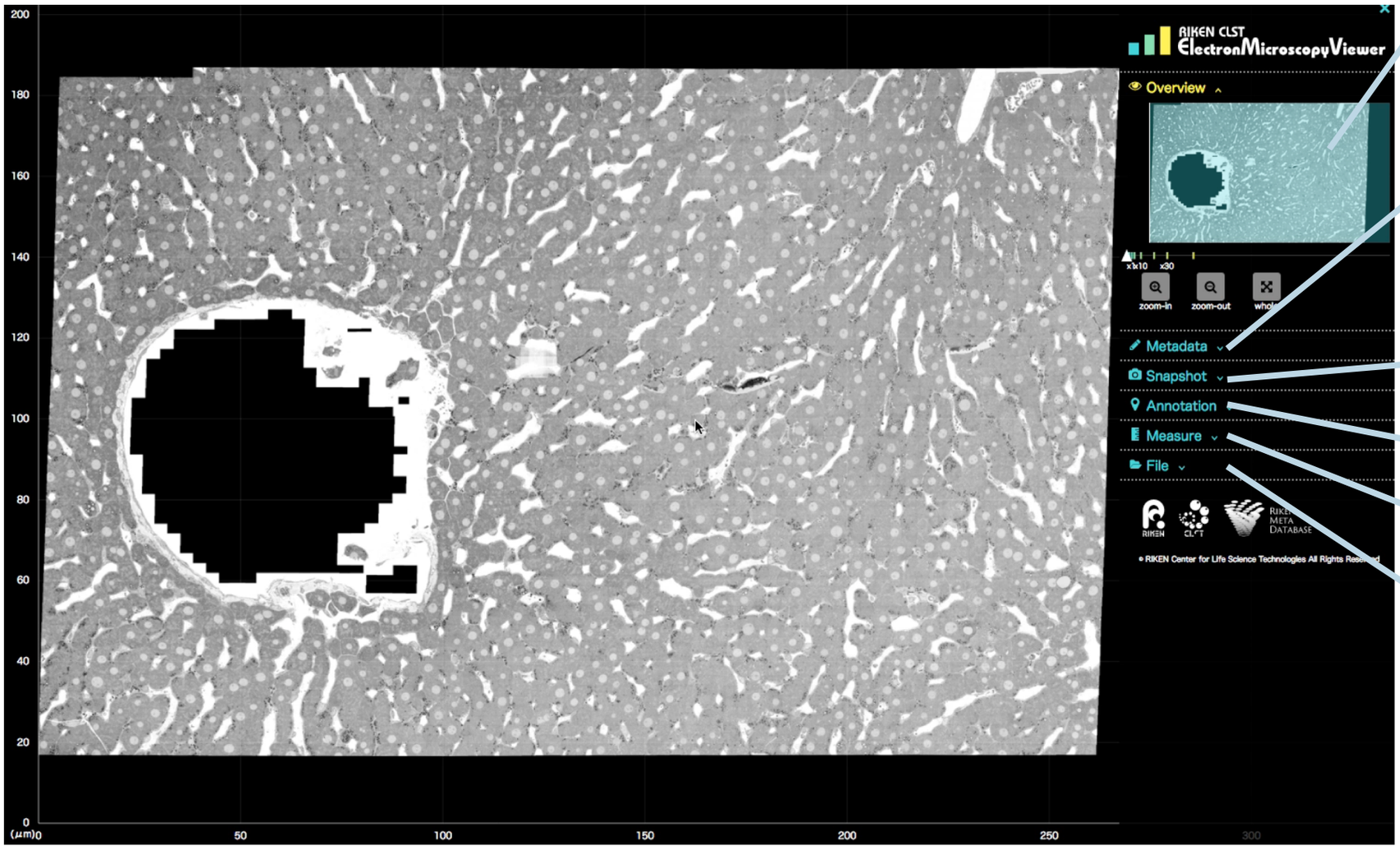
Pyramidal structure



Deep Zoom Image format

A tiled image pyramid structure.
This allows the Deep Zoom rendering engine to view a necessary particular view of an image

Normal rat liver (hepatic lobule , 664 µm x 1007 µm)



Overview

- Zoom-in
- Zoom-out etc

Metadata

- Taxon
- Organ/Tissue
- Imaging method etc

Snapshot

Annotation

Measure

Data output/input

Kume *et al*, JIST 2017: Semantic Technology, 2017.

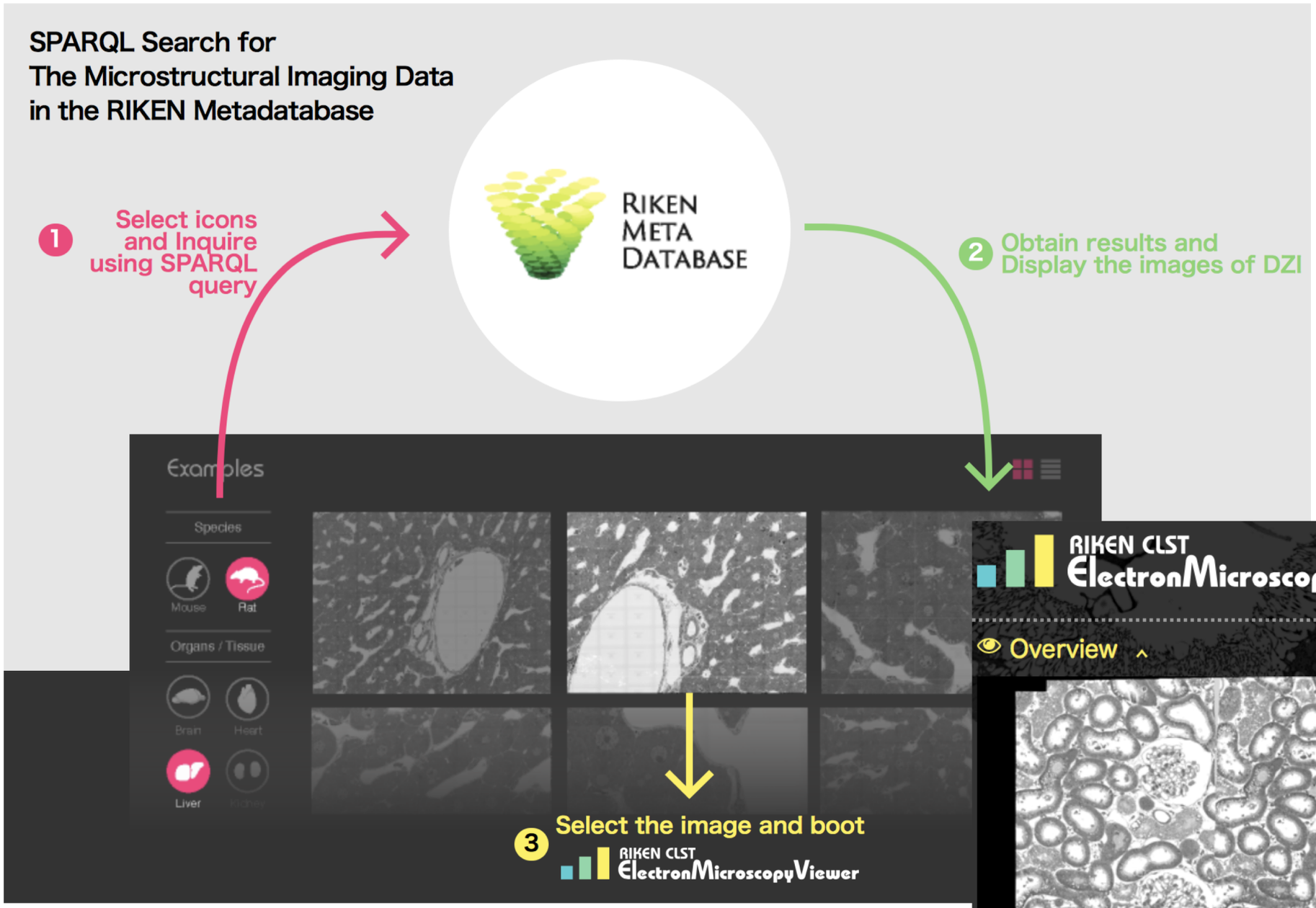
RIKEN Microstructural ImagingMetadatabase

http://clst.multimodal.riken.jp/CLST_ManageData/RikenImageDB

Google

RIKEN metadatabase

Imaging data management and share using the OME-based ontology



Aging Phenotype Catalog Based on Ultra-microstructural Imaging Data

Aging Process

Age-related changes in multi-organs

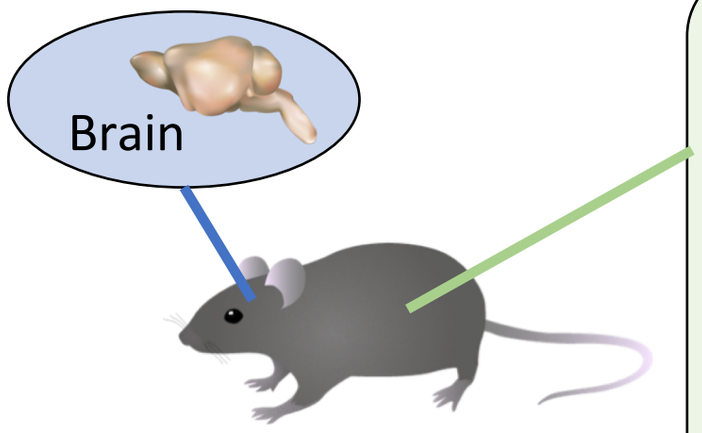
Late-aged mice (2 year-old)

Dysfunction and/or difficult maintenance of homeostasis

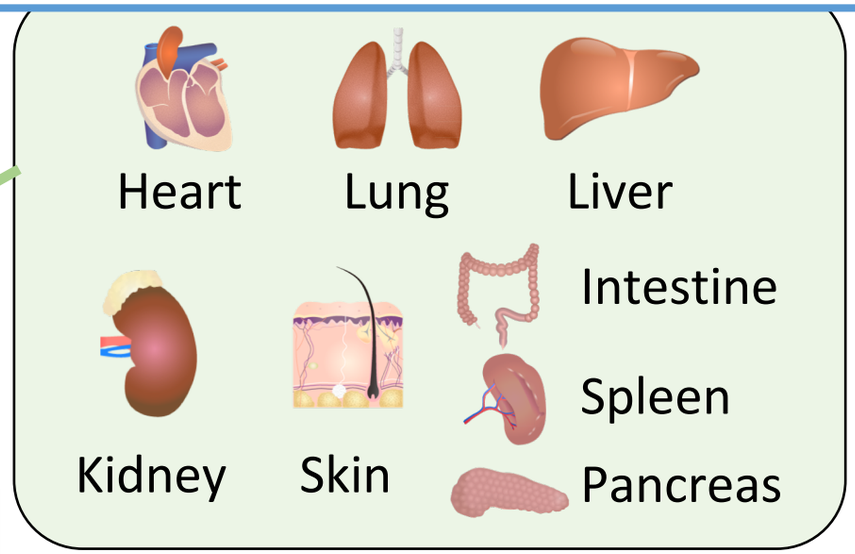
Middle-aged mice (1 and 1.5 year-old)

Young C57BL/6J mice (10 week-old)

EM imaging big data of multi-organs for aging catalog in mice



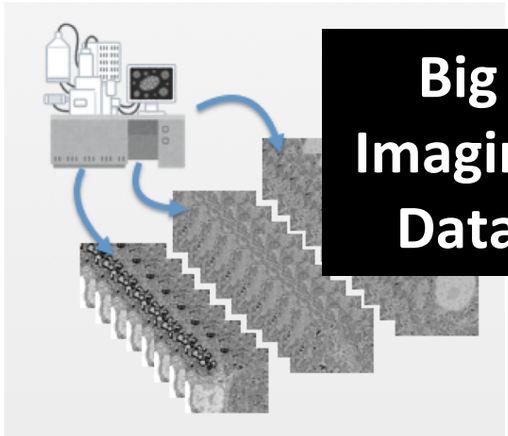
9 tissues during the aging processes



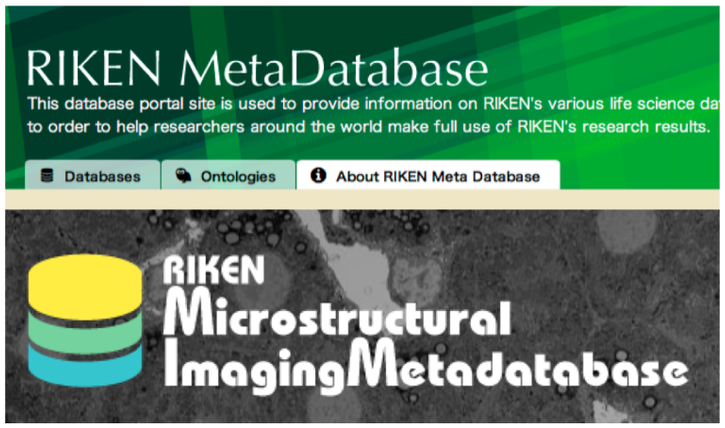
Now we published the imaging data for the tissues of young mice.

TOGO PICTURE GALLERY

Micro-Morphomics



Global data sharing using the ontology



Demo in the poster session!!

Kume S. *et al*, under preparation.