

# **SSBD: utilizing OMERO for developing an open database of microscopy images and quantitative data**

**Yukako Tohsato <sup>1,2)</sup>, Kenneth Ho <sup>2)</sup>,  
Koji Kyoda <sup>2)</sup>, Shuichi Onami <sup>2)</sup>**

1) Osaka Electro-Communication Univ.

2) RIKEN Center for Biosystems Dynamics Research

# SSBD database

- A open database of image/quantitative data  
<http://ssbd.qbic.riken.jp> (Since Sep. 2013)

## SSBD Database

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### Introduction of SSBD

**Systems Science of Biological Dynamics (SSBD)** database provides a rich set of resources for analyzing quantitative biological data, such as single-molecule, cell, and gene expression nuclei. Quantitative biological data are collected from a variety of species, sources and methods. These include data obtained from both experiment and computational simulation. These quantitative numerical data are represented in a new **Biological Dynamics Markup Language (BDML)**. The new data format allows users to exchange, store, compare and analyze data through the SSBD database. Users can download quantitative biological dynamics data directly in BDML format from the SSBD database. The system utilizes OMERO server to manage image data and experimental conditions. A range of software tools and applications for visualizing and analyzing quantitative biological dynamical data are being developed through a set of SSBD APIs.

### News and Events

**June 18, 2014: BDML schema 0.18 released!**

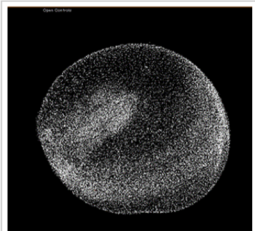
BDML schema version 0.18 has been released. All BDML-files and software have been updated.

**March 17, 2014: System maintenance notice (Date: Mar. 19 (JST))**

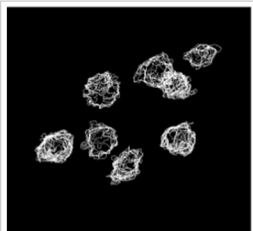
Due to system maintenance, SSBD database will be unavailable Mar. 19, 2014 10:00 am to 13:00 pm (About 4 hours, JST).

[Older news ...](#)

### Sample Datasets



Nuclear division dynamics in zebrafish wild-type embryo



Nuclear division dynamics in C. elegans wild-type embryo



Single molecule dynamics in E. coli wild-type

### Menu

BDML and PDPMML schemas can be found [here](#).

**OMERO web:** Some images can be viewed on [OMERO web](#). If you have problem viewing the images on the website, please click on the drop-down arrow on the right of 'public data' on the bar above the data tree, select 'Public' group and 'public data' to view the images (click [here](#) for more details).

Introducing SSBD Database

Introducing the  
SSBD Database  
Systems Science of Biological

### Copyright notice

Details can be found [here](#).

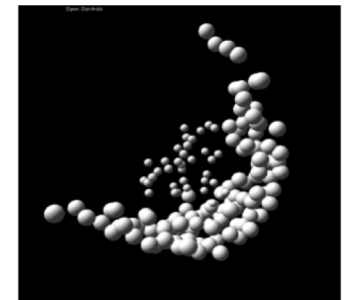
### Links

[OME](#) [WDDD](#) [WormBase](#)

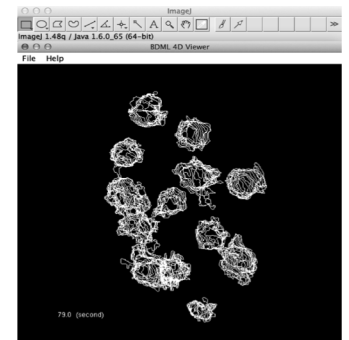
Image data



Quantitative data



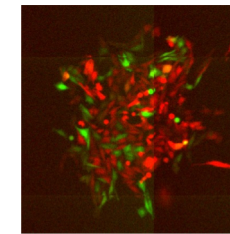
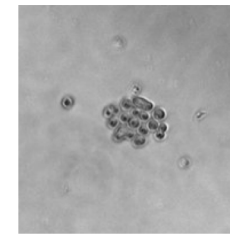
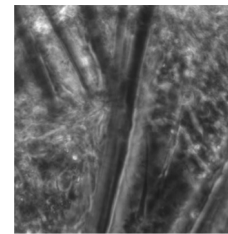
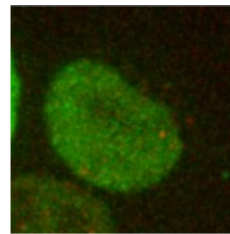
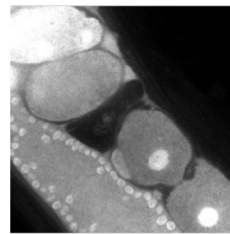
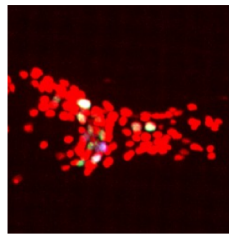
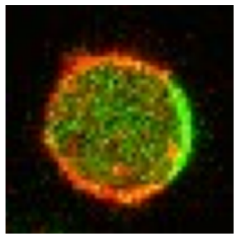
Software tool



# Examples of images stored in **SSBD**

We collect microscopy images that have been published in peer-reviewed journal under authors' permission.

Dictyostelium cell    *C. elegans* neuronal cell    *C. elegans* oocyte    Mouse ES cell    Mouse iPS cell    Mouse cultured cell    Hamster cultured cell

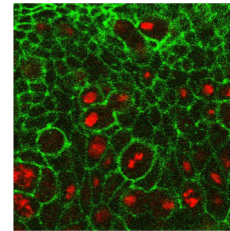
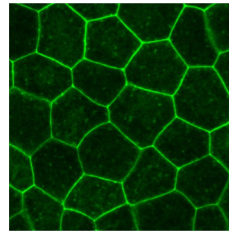
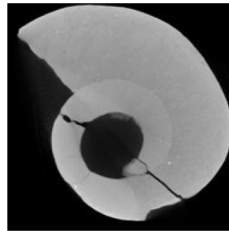
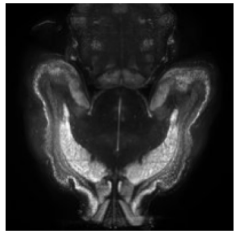


(Watabe et al. 2015) (Toyoshima et al. 2016) (Takayama & Onami 2016) (Ochiai et al. 2015) (Tanaka & Fujita 2015) (Yonemura 2014) (Matsuda et al. 2015)

Mouse

*D. cf. damesi*

*X. laevis* *D. melanogaster*



(Susaki et al. 2014)

(Inoue & Kondo 2016)

(Inomata et al. 2013)

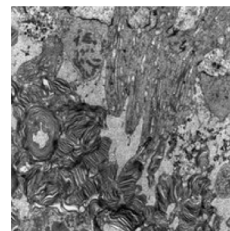
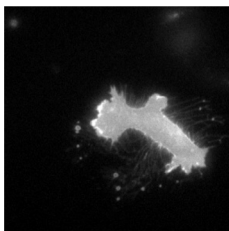
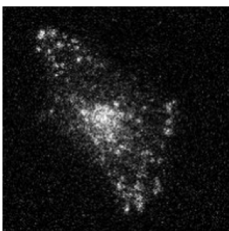
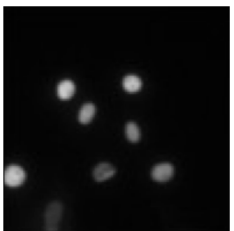
(Kondo & Hayashi 2011)

Rat

Dog

Human

Human

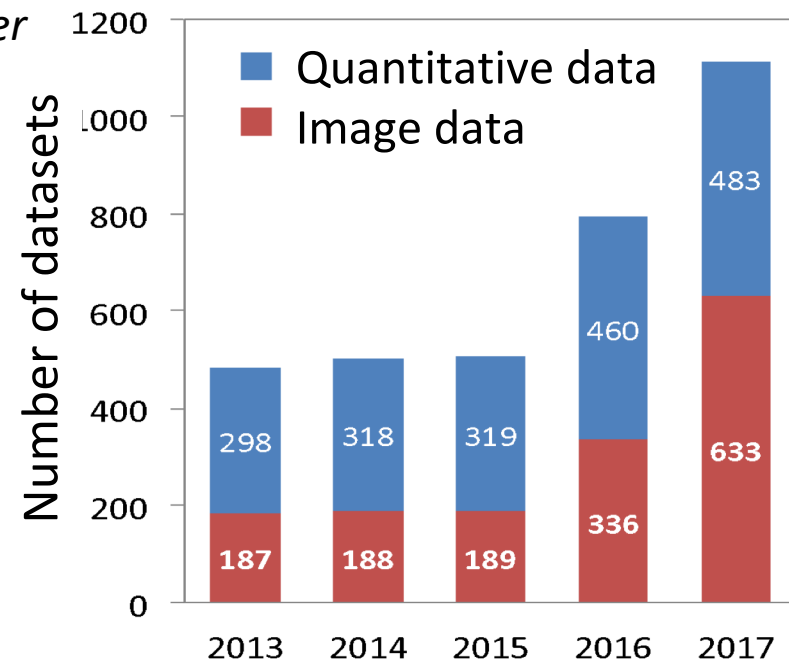


(Aoki et al. 2013)

(Takai et al. 2015)

(Kunida et al. 2012)

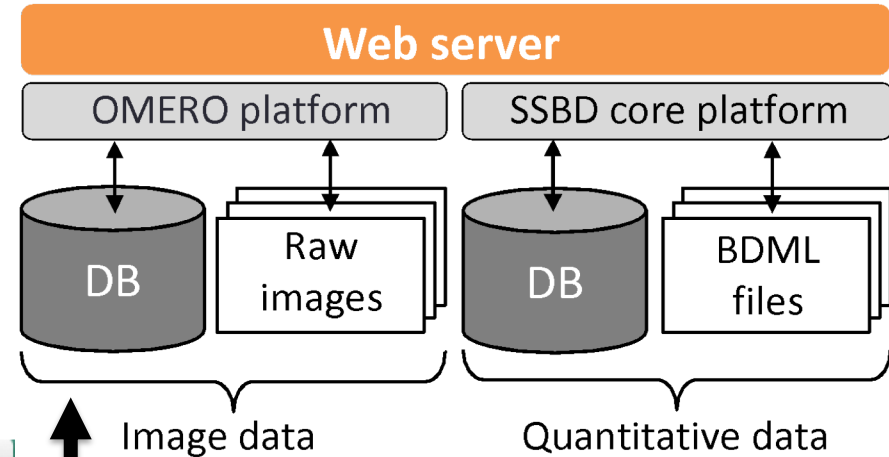
(Shirai et al. 2016)



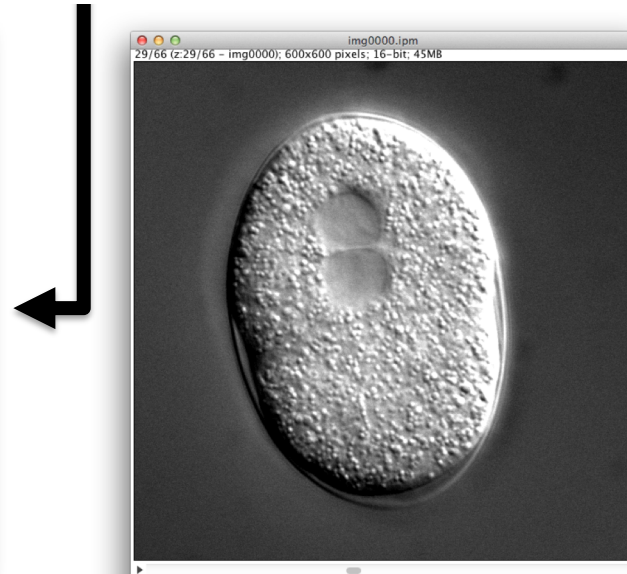
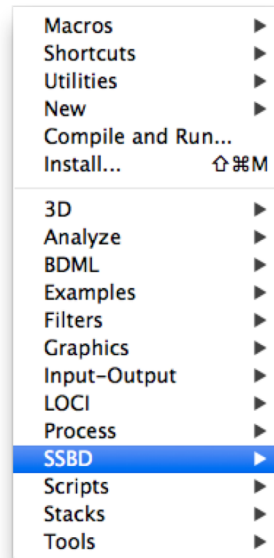
# ImageJ connection service

- Developing a session ID providing service as an OMERO/Django app.
- Sharing an ImageJ plugin (OMERO insight-ij) modified to request a connection from ImageJ to SSBD by the session ID.

## SSBD internal view



<http://ssbd.qbic.riken.jp/image/publicKey/>

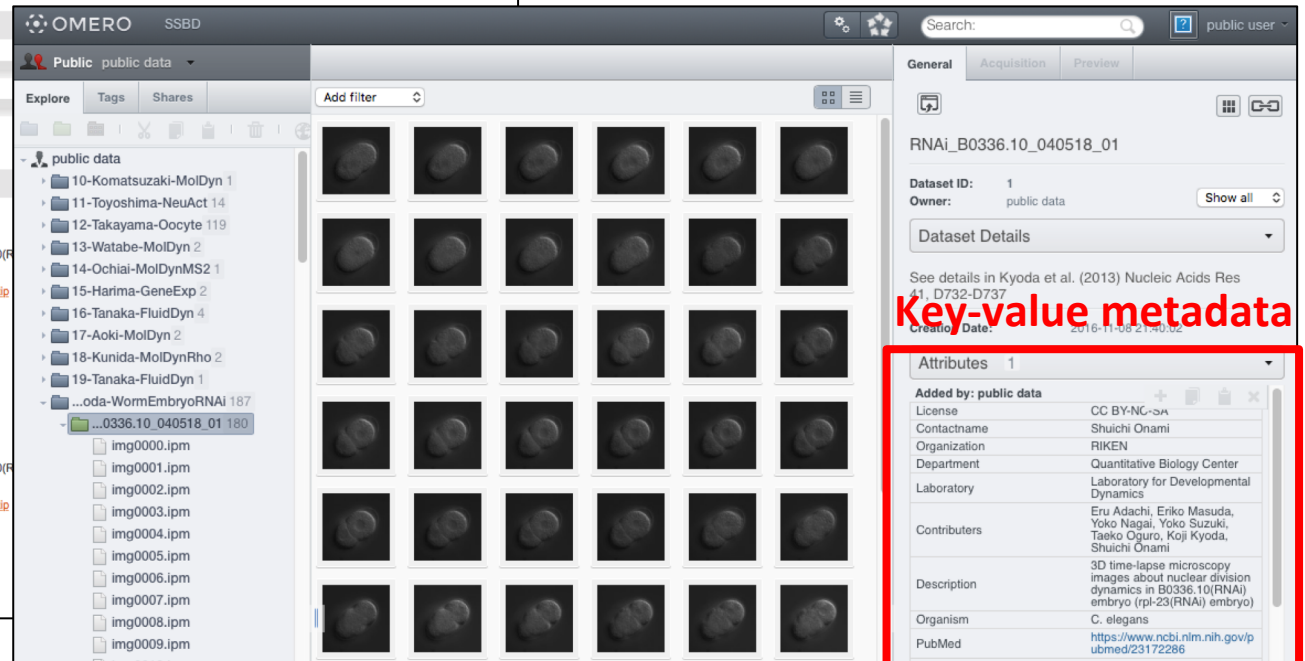
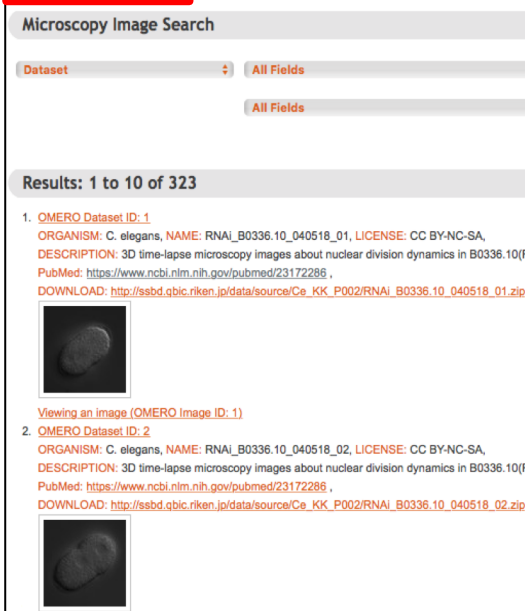
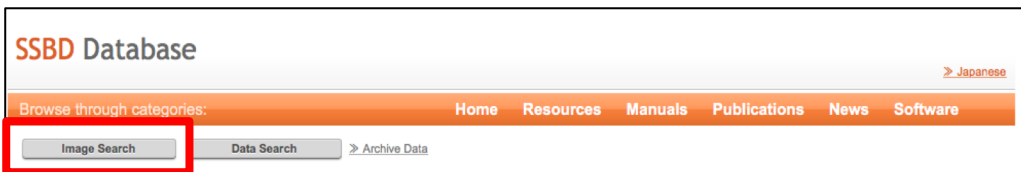


# Image search service

- Creating key-value metadata for images.
- Developing an image search service as an OMERO/Django app.
- Arrowing public user accession.

<http://ssbd.qbic.riken.jp/image/search/>

We would like to develop a more integrated service ...



Key-value metadata