

# ezEML+MOTHER Overview Version 1.2.2

ezEML+MOTHER is a tool for assisting scientists with the specification of the metadata that must be supplied with the histology images to be shared. This tool leverages the ezEML tool, which was created by the Environmental Data Initiative (EDI), for data provenance and adds metadata specific for MOTHER. The use of the ezEML+MOTHER Web application requires a login, which can be automatically requested with email verification required. Then you can work on documents across sessions and can submit an image with metadata to MOTHER.

## Navigation

- Use the top navigation bar to create or open a document, or to upload/download/view an XML file.
- Use the left navigation bar to enter in the various metadata. The left navigation bar indicates the high-level topics within the tool. Essentially, the items above the first line are the topics leveraged from ezEML, with the exception of Image, which has been redesigned for MOTHER. The Donor and Immunohistochemistry topics are specific to MOTHER.

NOTE: Items marked with an asterisk are required.

**Title\*:** A unique title is required for your slide.

The screenshot shows the top navigation bar with links for MOTHER, ezEML+MOTHER, Documents, Upload/Download/View, User Guide, and About. Below the navigation bar, the user is logged in as 'Welcome Back dietrich@asu.edu' and the active document is 'test2023-12-12'. The main content area is titled 'Title' and contains a form with the following elements:

- A heading 'Title' and a sub-heading 'Enter a title for the image:'.
- A required text input field labeled 'Title \*'.
- Two buttons: 'Save and Continue' and 'Reset Changes'.

The left sidebar contains a 'Contents' menu with the following items: Title (selected), Image, People, Abstract and Keywords, Intellectual Rights, Geographic/Temporal Coverage, Taxonomic Coverage, Methods, and Project. Below this, there are sections for 'Donor' (with 'Immunohistochemistry' listed) and 'Check Metadata' (with 'Submit Metadata' listed). At the bottom, it shows 'Uploaded Image' as 'None'.

## Image\*:

The Name and Data Format fields will be automatically filled by the selection of the Upload Image. Image Type defaults to histology. Additional Info is a text area for any additional information to share about the image that is not in the Donor or Immunohistochemistry forms. For example, any citation to a published paper or measurements of the donor taken. Using a key:value syntax separated by ; opens up the possibility of accessing this information computationally in the future.

The screenshot shows the 'Image' metadata form with the following elements:

- A heading 'Image' and a sub-heading 'Enter information about the image:'.
- A required text input field labeled 'Name \*'.
- A required text input field labeled 'Image Type (e.g., histology) \*'.
- A required text input field labeled 'Data Format (e.g., tif) \*'.
- An 'Upload Image' section with a 'Browse...' button and the text 'No file selected.'.
- An 'Uploaded Image' section with the text 'None'.
- An 'Additional Info' section with a large text area.
- Two buttons: 'Upload and Continue' and 'Reset Changes'.

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**People\***: MOTHER strongly recommends providing the first name and last name with organization for any person entered. For a scientist, it is also highly recommended to include their ORCID for unique identification. The MOTHER database currently stores the contact, metadata providers, and investigative personnel on a funding award associated with the image. The MOTHER Web search displays the information for the contact. Note that EML requires at least one creator and at least one contact and only requires at least one of the following: Last name, Organization, or Position Name. *Please follow the recommendations for MOTHER.*

- Creators: an author of the data, i.e. a person responsible for intellectual input into its creation
- Contacts: the designated contact for the data manager
- Associated Parties: involved with the data in some way, e.g., technicians, students, assistants
- Metadata Providers: producing or providing provided the metadata content

### **Abstract and Keywords:**

- Abstract: include any information that does not fit into the structured metadata
- Keywords: terms in support of keyword search in MOTHERDB, e.g. any term describing treatment, disease, pathology, phenotype, toxicology, or toxin/toxicant exposure

**Intellectual Rights\***: CC0 or CC BY can be chosen with a radio button. Other licenses can be specified.

**Geographic/Temporal Coverage**: Specifications can be included if applicable for data related to the geographic or temporal information for the donor animal

**Taxonomic Coverage\***: Required specification of the genus and species for the donor animal; Supports lookup in select taxonomic authorities based on the Species Binomial Scientific Name (e.g. *mus musculus*)

**Methods**: Method steps are descriptions of specific steps of the method employed when collecting data. They are intended to be descriptive, i.e., human-readable rather than machine-readable. These may include text descriptions of the procedures, experiment, relevant literature, software, instrumentation, source data and any quality control measures taken.

**Project**: Documents the research context with a required title and optional abstract, and can include the specification of project personnel with various roles, funding awards, and related projects.

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**Donor\***: Details information regarding the donor animal, including its life stage, reproduction cycle type, and stage of cycle. Also provides details on the histology slide, such as fixation, stain, and section thickness.

**Immunohistochemistry**: If the image is immunohistochemistry, provide the target protein, detection method, as well as primary and secondary antibodies.

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**Check Metadata**: Checks the completeness of the metadata

**red**: errors exist; **orange**: warnings exist; **green**: no warnings or errors

**Submit Metadata**: Submits the metadata and the image file for curation into MOTHER, only if the metadata is valid and the image has been loaded. Please download the zip file for your records.

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**Donor ID** must be a unique designation of the donor animal for the ovary image across *all* donors. Thus, this is not a simple number but should be an encoding of the Lab\_GenusSpecies\_AnimalID or Lab\_GenusSpecies\_date\_sequence that uniquely identifies the donor.

Donor ?

<b>Donor ID *</b> <input type="text"/>	<b>Sex *</b> female	<b>Years</b> <input type="text"/>	<b>Days</b> <input type="text"/>	<b>Life Stage *</b> <input type="text"/>
<b>Specimen Sequence Number *</b> <input type="text"/>	<b>Specimen Tissue *</b> ovary	<b>Ovary Position *</b> <input type="text"/>	<b>Specimen Location *</b> <input type="text"/>	<b>Corpus Luteum Type</b> <input type="text"/>
<b>Day Of Cycle</b> <input type="text"/>	<b>Cycle Type</b> <input type="text"/>	<b>Stage Of Cycle</b> <input type="text"/>		
<b>Follicular Values</b> <input type="text"/>		<b>Luteal Values</b> <input type="text"/>		
<b>Slide ID *</b> <input type="text"/>	<b>Experimental Treatment *</b> <input type="text"/>	<b>Compound, dose, route, duration</b> <input type="text"/>		
<b>Other Pathology</b> <input type="text"/>	<b>Section Sequence Number</b> <input type="text"/>	<b>Section Thickness *</b> <input type="text"/>	<b>Section Thickness Units *</b> <input type="text"/>	
<b>Fixation *</b> <input type="text"/>	<b>Other Fixation</b> <input type="text"/>	<b>Stain *</b> <input type="text"/>		
<b>Stain Light Type</b> <input type="text"/>	<b>Sudan Stain Value</b> <input type="text"/>	<b>Other Light Stain</b> <input type="text"/>		
<b>Stain Fluorescent Type</b> <input type="text"/>	<b>Other Fluorescent Stain</b> <input type="text"/>	<b>Stain Electron Type</b> <input type="text"/>	<b>Other Electron Stain</b> <input type="text"/>	
<b>Magnification *</b> <input type="text"/>	<b>Microscope Maker</b> <input type="text"/>	<b>Microscope Model</b> <input type="text"/>		
<b>Microscope Notes</b> <input type="text"/>				
<input type="button" value="Save and Continue"/>		<input type="button" value="Reset Changes"/>		

**Life Stage** values are currently for mammals: *fetal, neonatal, prepubertal, pubertal, adult, aging*. However, a value of *unspecified* is included, if needed.

*MOTHER needs input for life stages for other species.*

Cycle Type values with stages to choose are currently: *menstrual, estrous*. Choose *other* to enter a stage manually.

*MOTHER needs cycle types & stages for other species.*

**Slide ID:** must be unique within Donor ID and Specimen Sequence Number. If you are contributing 2 images from the same physical slide, use a section number to uniquely identify, e.g. 1A, 1B

**Experimental Treatment:** must choose a value: *No Treatment, Control no treatment, Control mock treatment, Treatment*

**Compound, dose, route, duration:** enter information if *Control mock treatment* or *Treatment*

**Other Pathology:** if applicable, enter information, e.g. cancer

**Section Sequence Number:** only if submitting a collection of images allowing for a 3d reconstruction

**Section Thickness Units:** Microns, NM

**Fixation** and **Stain** are required. Selections enable/disable dropdowns.

**Fixation:** *Neutral Buffered Formalin 10, Paraformaldehyde, Davidsons, Neutral Buffered Formalin5 acetic Acid, Bouins, Other*

**Stain:** *Light, Fluorescent, Electron*

**Specimen Sequence Number:** This is typically 1, unless there are multiple ovaries collected for the same donor.

**Ovary Position:** *Left, Right, Unspecified*

**Specimen Location:** *whole ovary, ovarian cortex, ovarian medulla, follicle, corpus luteum, unspecified*

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## Immunohistochemistry ?

Is this image immunohistochemistry?

If your slide image is immunohistochemistry, all fields with an \* are required. See image below of dropdown values for Detection Method.

Target Protein \*

Detection Method \*

### Primary Antibody

Target Species *	Host Species *	Dilution *
<input type="text"/>	<input type="text"/>	<input type="text"/>
Lot Number *	Cat Number *	
<input type="text"/>	<input type="text"/>	
Source Name *	Source City *	Source State *
<input type="text"/>	<input type="text"/>	<input type="text"/>
RRID	Clonality *	
<input type="text"/>	<input type="button" value="v"/>	

### Secondary Antibody

Target Species *	Host Species *	Dilution *
<input type="text"/>	<input type="text"/>	<input type="text"/>
Lot Number *	Cat Number *	
<input type="text"/>	<input type="text"/>	
Source Name *	Source City *	Source State *
<input type="text"/>	<input type="text"/>	<input type="text"/>
RRID		
<input type="text"/>		

### Detection Methods Dropdown:

Detection Method \*

- ABC (avidin-biotin complex)
- Alkaline Phosphatase
- Diaminobenzidine
- FITC
- Horseradish Peroxidase
- LSAB (labeled streptavidin-biotin)
- RPE