3D Microscopy Metadata Standards (3D-MMS)

Image Category

The Image category includes 33 metadata fields that describe the size and 3-dimensional orientation of the image, the channels and fluorophores used, and the location of relevant landmarks.

Field Name	Definition	Allowable Values	Occurrence	Required for Brain Image Library Submission	Supports Digital Object Identifier (DOI)	DataCite (ID: Property)	Open Microscopy Environment (Element: Attribute)
Orientation							
xAxis	Predominant tissue direction as one moves from the left side of the image to the right side of the image.	Left-to-right Right-to-left Anterior-to-posterior Posterior-to-anterior Inferior-to-superior Superior-to-inferior Oblique	1	Yes	No	None	StageLabel: X StageLabel: XUnit
obliqueXDim1	Only if xAxis is oblique, enter the orientation.	Left Right	1	Required if xAxis is oblique	No	None	None
obliqueXDim2	Only if xAxis is oblique, enter the orientation.	Anterior Posterior	1	Required if xAxis is oblique	No	None	None
obliqueXDim3	Only if xAxis is oblique, enter the orientation.	Inferior Superior	1	Required if xAxis is oblique	No	None	None
yAxis	Predominant tissue direction as one moves from the top of the image to the bottom of the image.	Left-to-right Right-to-left Anterior-to-posterior Posterior-to-anterior Inferior-to-superior Superior-to-inferior Oblique	1	Yes	No	None	StageLabel: Y StageLabel: YUnit

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obliqueYDim1	Only if yAxis is oblique, enter the orientation.	Left Right	1	Required if yAxis is oblique	No	None	None
obliqueYDim2	Only if yAxis is oblique, enter the orientation.	Anterior Posterior	1	Required if yAxis is oblique	No	None	None
obliqueYDim3	Only if yAxis is oblique, enter the orientation.	Inferior Superior	1	Required if yAxis is oblique	No	None	None
zAxis	Predominant tissue direction as one follows a given pixel position through the stack of images from the first image to the last image.	Left-to-right Right-to-left Anterior-to-posterior Posterior-to-anterior Inferior-to-superior Superior-to-inferior Oblique	1	Yes	No	None	StageLabel: Z StageLabel: ZUnit
obliqueZDim1	Only if zAxis is oblique, enter the orientation.	Left Right	1	Required if zAxis is oblique	No	None	None
obliqueZDim2	Only if zAxis is oblique, enter the orientation.	Anterior Posterior	1	Required if zAxis is oblique	No	None	None
obliqueZDim3	Only if zAxis is oblique, enter the orientation.	Inferior Superior	1	Required if zAxis is oblique	No	None	None
Landmark							

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landmarkName	Name of the landmark (e.g., bregma).	Free text	0-1	No	No	None	None
landmarkX	X coordinate of the landmark.	Number	0-1	No	No	None	None
landmarkY	Y coordinate of the landmark.	Number	0-1	No	No	None	None
landmarkZ	Z coordinate of the landmark.	Number	0-1	No	No	None	None
Channel							
Number	Number assigned to each channel.	Number	1	Yes	No	None	Channel: ChannelID
displayColor	Original display color for rendering each channel in triplet (red, green, blue) format.	Free text	1-n	Yes	No	None	Channel: Color
Representation	What the channel represents (e.g., rhodopsin, virus).	Free text	0-1	No	No	None	Channel: Name
Fluorophore	Fluorophore used in the channel (e.g., egfp, alexa-561, ATO-647).	Free text	0-1	No	No	None	Channel: Fluor
Size							
stepSizeX	Physical step size in the X-dimension (e.g., pixel size represents the	Free text	1	Yes	No	None	Pixels: PhysicalSizeX Pixels: PhysicalSizeXUnit

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	number of microns).						
stepSizeY	Physical step size in the Y-dimension (e.g., pixel size represents the number of microns).	Free text	1	Yes	No	None	Pixels: PhysicalSizeY Pixels: PhysicalSizeYUnit
stepSizeZ	Distance between the center of one image and the center of adjacent images in the Z-dimension (space in microns between slices).	Free text	0-1	No	No	None	Pixels: PhysicalSizeZ Pixels: PhysicalSizeZUnit
stepSizeT	Physical step size in the T dimension (time).	Free text	0-1	No	No	None	Pixels: TimeIncrement Pixels: TimeIncrementUnit
Channel	Number of channels.	Number	0-1	No	No	None	
Slices	Number of slices per channel (approximate).	Number	0-1	No	No	None	
t	Number of timepoints.	Number	0-1	No	No	None	
xSize	Number of pixels in the X-dimension.	Number	0-1	No	No	None	Pixels: SizeX

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ySize	Number of pixels in the Y-dimension.	Number	0-1	No	No	None	Pixels: SizeY
zSize	Number of pixels in the Z-dimension.	Number	0-1	No	No	None	Pixels: SizeZ
Gbyte	Total size in gigabytes.	Number	0-1	No	No	None	
File	Total number of image files.	Number	0-1	No	No	None	
dimensionOrder	XYZT, or whatever order is used.	Free text	0-1	No	No	None	Pixels: DimensionOrder

Occurrence

0-n = optional and repeatable

0-1 = optional, but not repeatable

1-n = required and repeatable

1 = required, but not repeatable