

Cell Centered Database

University of California, San Diego

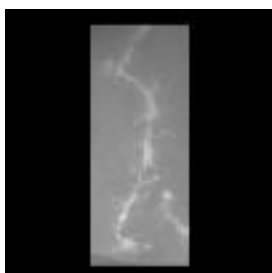
maryann@ncmir.ucsd.edu

Microscopy Product #:32 wt2_g16

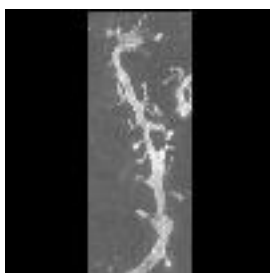
For the most updated information, please visit

<http://ccdb.ucsd.edu/CCDBWebSite/main?event=displaySum&mpid=32>

Image2D



Reconstruction



Segmentation



Project Information:

| | |
|---------------------|--|
| PROJECT_ID | P1207 |
| PROJECT_NAME | Correlative microscopic characterization of dendritic spines in a transgenic mouse model of hyperdopaminergia: The dopamine transporter knockout mouse |
| PROJECT_DESCRIPTION | Multiscale characterization of DAT KO transgenic mouse |
| LEADER | Diana Price |
| FUNDING_AGENCY | NIH |
| PROJECT_START_DATE | 2003-01-01 00:00:00.0 |
| PROJECT_END_DATE | |
| COLLABORATORS | Aki Laakso, Michele Cyr, Maryann Martone , Naoko Yamada , Andrea Thor , Monica Berlanga |
| PUBLICATION1 | |
| PUBLICATION2 | |
| PUBLICATION3 | |

| | |
|---------------------------------|--|
| Experiment Information - | |
| PURPOSE | EMT reconstructions of medium spiny neuron dendrites |
| TITLE | P1207 Experiment 5 |
| EXPERIMENTER | Diana Price, Masako Terada, Andrea Thor |
| EXPERIMENT_NAME | |
| EXPERIMENT_DATE | 2003-04-22 00:00:00.0 |

| Subject Information - | |
|-----------------------|----------------------|
| GROUP_BY | genetic manipulation |
| SUBJECT_NAME | wildtype/control |
| FIXATION_METHOD_ID | 11 |
| SCIENTIFIC_NAME | mus musculus |
| SPECIES | mouse |
| STRAIN | C57BL/129SvJ |
| AGE | 7 months |
| AGECLASS | adult |
| ANIMAL_NAME | |
| LITTER_ID | |
| SEX | male |
| VENDOR | |
| WEIGHT | 32 grams |

| Tissue - | |
|---------------------|-------------------|
| ANATOMIC_LOCATION | neostriatum |
| MICROTOME | vibratome |
| ORIENTATION | coronal |
| THICKNESS | 100 um |
| TISSUE_PROD_STORAGE | p1207 Slide Box 1 |
| EXTERNAL_FILE_NAME | NA |
| TISSUE_GROUP_TYPE | NA |

| Microscopy Product Information - | |
|----------------------------------|--|
| MICROSCOPY_PRODUCT_ID | 32 |
| IMAGE_BASENAME | wt2_g16 |
| CREATE_DATE | 2003-10-10 00:00:00.0 |
| INSTRUMENT | Hitachi UHVEM |
| MICROSCOPE_TYPE | UHVEM |
| PLANE_COUNT | |
| PRODUCT_TYPE | single axis tilt series |
| PURL | NA |
| SESSION_NAME | |
| TELESCIENCE_SRB | P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32 |
| X_RESOLUTION | .022 um/pixel |
| Y_RESOLUTION | .022 um/pixel |
| XSIZE | 1024 |
| YSIZE | 1024 |

Protocol:

Experiment #5 DAT KO mouse 04/22/03

Description: Photoconverted dye-filled striatal medium spiny

neurons for EM

Animal Info: ID# wt3 wt4

Weight: 34g 32g

DOB: 9/30/02 9/30/02

Protocol

1. Perfusion (at Duke)

Nembutal; 4% paraformaldehyde + 0.1% gluteraldehyde

2. Sectioned on Vibratome (at NCMIR)

Thickness = 100 microns

Store in 1X PBS in fridge

3. Fill cells with Lucifer yellow

4. Store slices with filled cells in 4% para in fridge

5. Wash 6x with PBS 1X (on ice)

6. When ready to begin photoconversion, turn on the chiller in confocal room. Set at -4°C . The refrigerator unit should be set at $\text{TEMP} < 45^{\circ}\text{C}$. Switch ON. Stage needs around 20 minutes to come to temperature. Pull unit out into hallway (to avoid increase in temperature).

6. Place slices in 2% glut/PBS on ice for 15 minutes

0.8 ml 25% gluteraldehyde

2 ml 5x PBS

6.2 ml ddH₂O

7. Briefly wash slices in PBS

8. Place slices in PBS/glycine for a few minutes

38 mg glycine

10 ml 1x PBS

9. Follow instructions for Photoconversion of Lucifer Yellow-filled cells

10. After photoconversion, remove DAB solution and wash slice 3x 10 minutes in generous volumes of PBS on ice. Must remove all DAB before beginning osmification.

Microwaving protocol for osmication, dehydration, and embedding of photoconverted slices

* Prepare Resin mix and let it sit covered and undisturbed until needed (instructions by fume hood in embedding area).

* Rinse slices with a generous amount of cold 1X PBS on ice for ~ 10 min.

* Turn on circulating bath (over 20°C, ~ RT): water bath (left hand side) will fill.

* Insert temperature probe

* Fill other T-beaker with water

* Set temperature to 35°C

* Open new bottle of 100% ethanol and prepare following dilutions:

90% ethanol

70% ethanol

50% ethanol

* Make up osmium solution under fume hood and chill on ice

* 1% osmium tetroxide in PBS on ice.

2.0 ml PBS 5X

then 5.5 2x distilled H₂O

2.5 ml Osmium 4%

* Rinse w/ 2x distilled H₂O ? 3 x 5min

* Warm up microwave for 2 minutes on high

* Label tubes & place in rack on ice

* Fill tubes with osmium solution (w/ meniscus at 0.5)

* Using glass hooks, transfer slices to tubes

* Remove temperature probe & set temp above 50°C.

* Put rack w. tubes in for 40 sec at full power

* Change rear water load in T-beaker

* Change osmium solution on ice and microwave for another 40 seconds at full power

* Rinse samples for 2 minutes in distilled water on benchtop (at RT)

* Insert petri bath with H₂O under rack

* Dehydration steps (2 x 40 seconds per step; all @ 35°C)

1st

2nd

50% EtOH

70% EtOH

90% EtOH

100% EtOH

100% Acetone

* All of the dehydration steps should be carried out in microcentrifuge tubes filled with 600 ml of solution. Temperature probe should be in petri dish and set for 35. Change water in rear water load when warm to touch.

* Change from water to acetone in petri bath under rack ? check acetone bath level every 3 minutes

* Infiltration steps (both @ 50°C):

With a 50/50 mixture of resin and acetone:

1 x 15

min

1:1 Resin:acetone

* Check rear water load at

7.5 minutes

Switch to 100% resin for 3 x 10 minutes:

1st

2nd

3rd

100% Resin

*Periodically check rear water load

* Flat embed samples between mould release slides and place in embedding oven under vacuum.

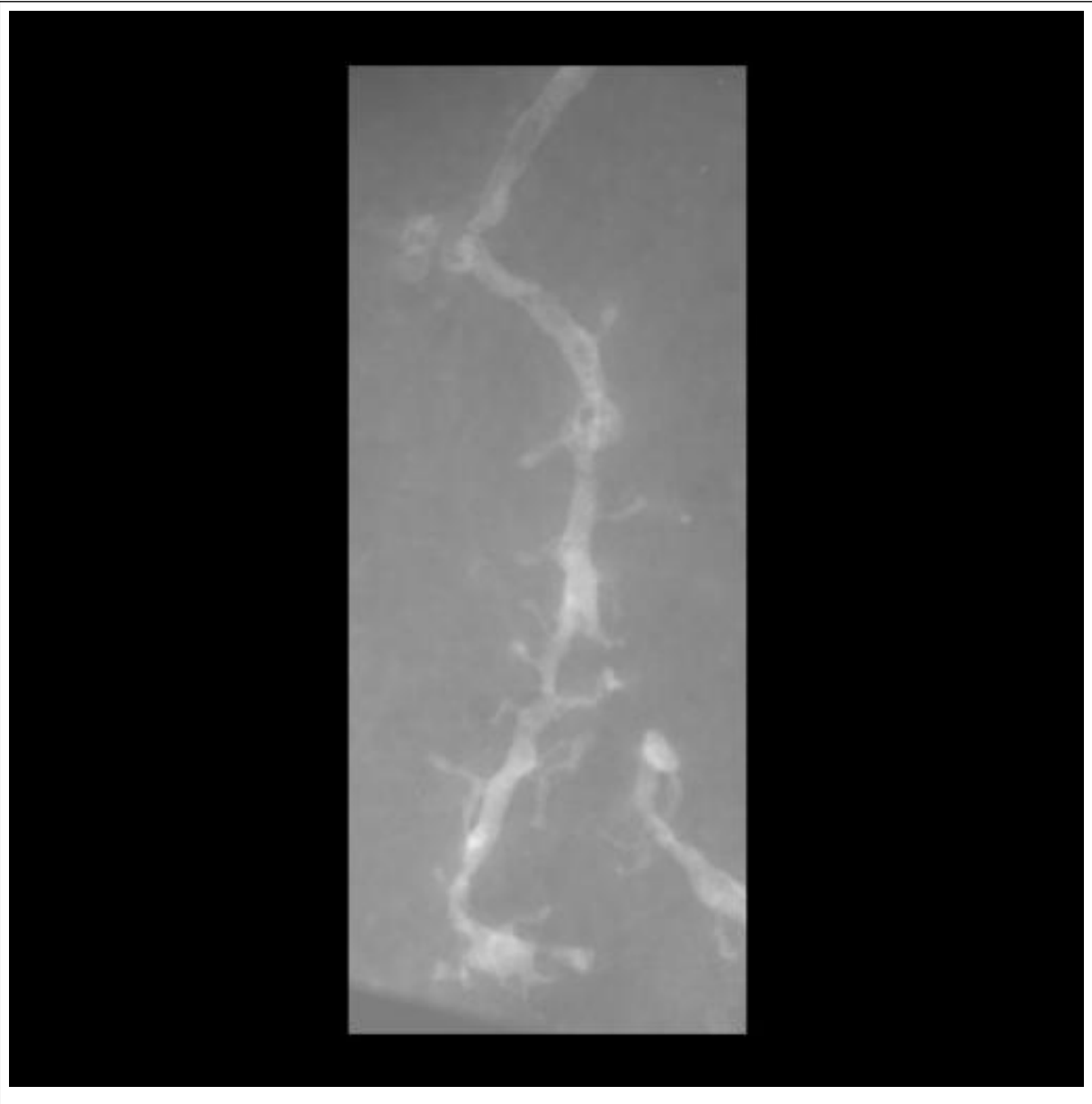
| Image Type - | |
|--------------------------|---|
| SINGLE_TILT_IMAGE_SEQ_ID | 9 |
| TILT_INCREMENT | 2 degrees |
| THROUGH_FOCUS_SERIES_ID | 6021 |
| ZSTEP | .25microns |
| THROUGH_PSFFILE | 061603_2 |
| THROUGH_DESC | transmitted light z series through photoconverted medium spiny neuron |
| THROUGH_NOTES | WT2 grid 16 tomo 8 |
| SINGLE_TILT_IMAGE_SEQ_ID | 6115 |
| SINGLE_TILT_DESC | Spiny Dendrite Tomo |

| Specimen Description - | |
|------------------------|---|
| ANATOMICAL_DETAIL | 6045 |
| ATLAS | Paxinos and Franklin, 2000 |
| ATLAS_COORD | 2.125, -4, .02 |
| CELL_ID | 061603B |
| CELL_TYPE | medium spiny neuron |
| ORGAN | brain |
| REGION | neostriatum |
| STRUCTURE | spiny dendrite |
| SYSTEM | central nervous |
| TISSUE | striatum |
| ANATOMICAL_NOTES | WT2 grid16 tomo8 atlas plate figure 31 |

| Electron Microscopy Product - | |
|-------------------------------|-------|
| EM_PRODUCT_ID | 6150 |
| ACCELERATING_VOLTAGE | 3 MeV |
| EMBEDDING_MEDIUM | resin |
| MAGNIFICATION | 3000 |
| RECORDING_MEDIUM | film |
| LMPRODUCT_ID | 25 |
| COVER_SLIP_THICKNESS | 1 um |
| IMMERSION_MEDIUM | oil |
| LENS_MAGNIFICATION | 60 X |
| MOUNTING_MEDIUM | resin |
| NUMERICAL_APERTURE | 1.4 |

Raw 2D Image

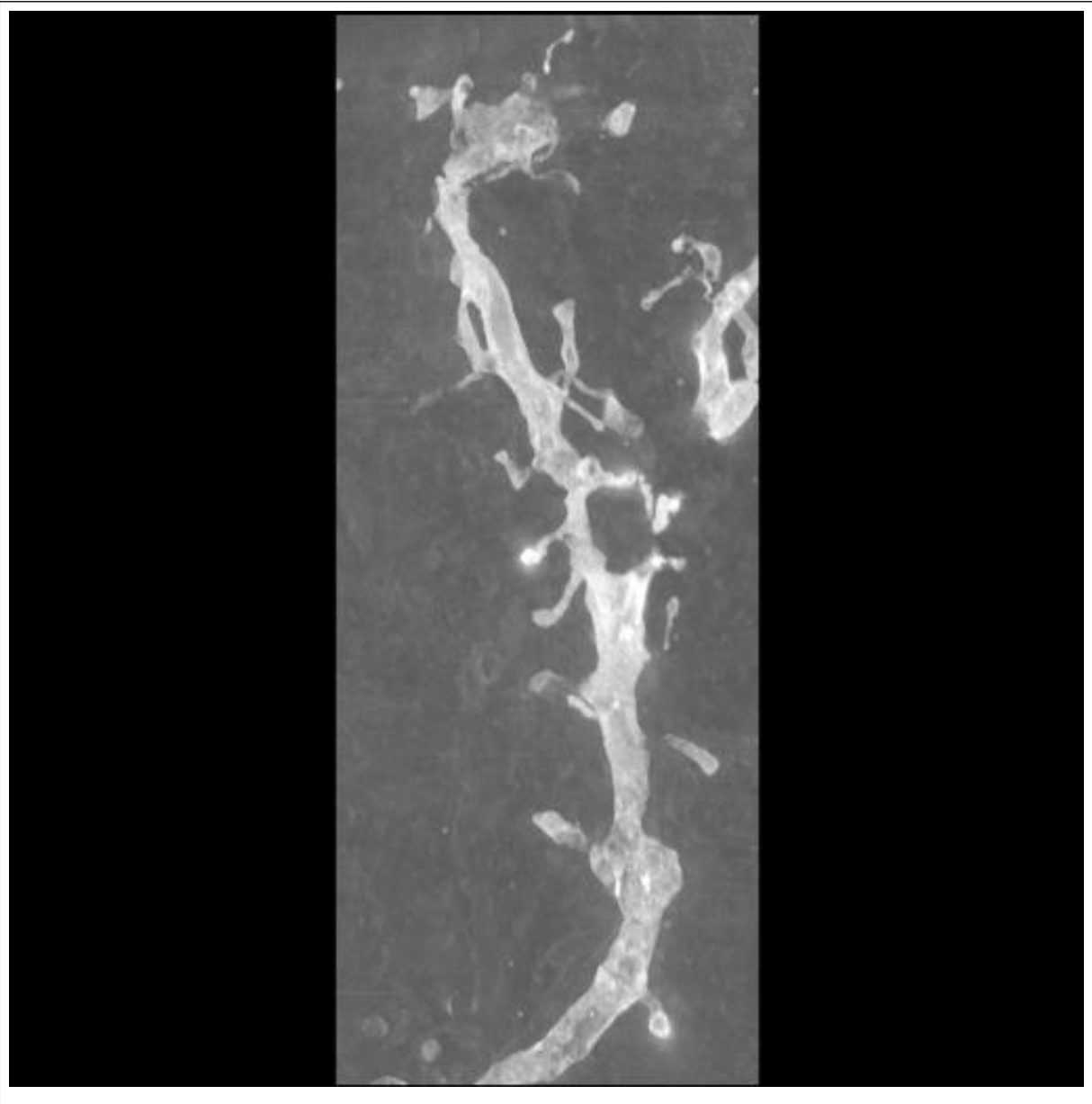
Raw Low Resolution 2D Image -



| Raw 2D Image - | |
|--------------------|--|
| IMAGE2D_ID | 6133 |
| IMAGE_DATE | 2003-11-21 00:00:00.0 |
| IMAGE_DESC | a .tar file containing the .ali, .preali, .seed and .fid files for an IMOD reconstruction. |
| IMAGE_FILE_FORMAT | imod mrc |
| IMAGE_FILE_NAME | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_image.jpg |
| MAGNIFICATION | 3000 X |
| RAW_ANIMATION_DESC | a .mpg movie file of the aligned tilt series of a spiny dendrite specimen |
| RAW_ANIMATION_FILE | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_image.mpg |
| RAW_DATA_FILE | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_image.tar |
| THUMBNAIL_DESC | A 512 by 512 image from the tilt series of a spiny dendrite specimen |
| THUMBNAIL_FILE | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_image_thumb.jpg |
| X_SIZE | 1024 pixels |
| Y_SIZE | 1024 pixels |

Reconstruction

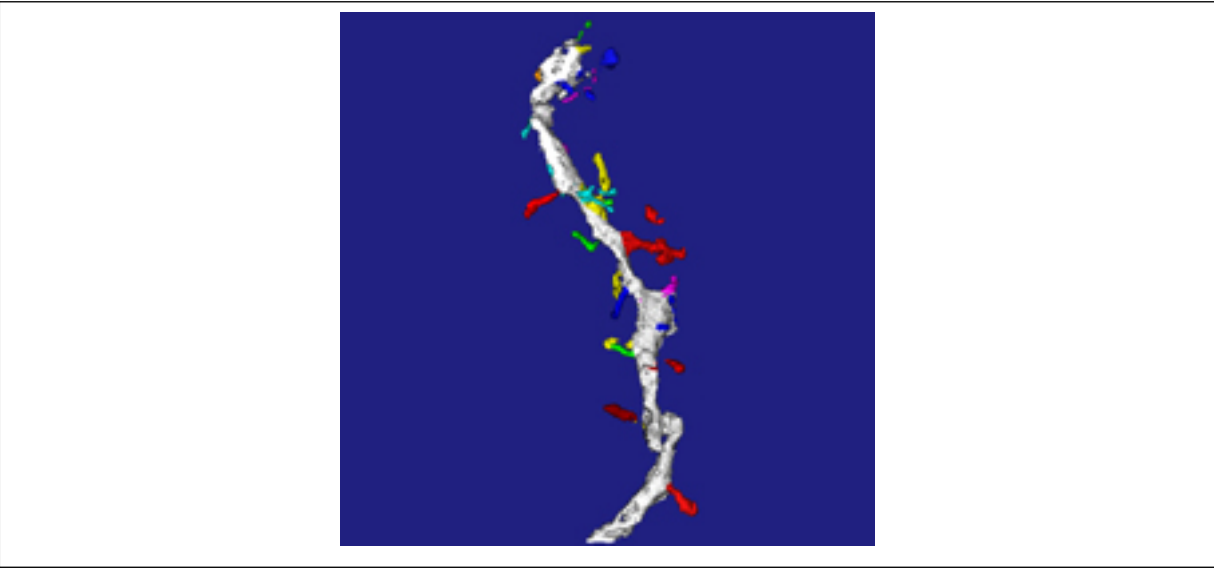
Reconstruction Image -



| Reconstruction - | |
|--------------------------|--|
| RECONSTRUCTION3D_ID | 32 |
| ALIGNMENT_METHOD | semi-automatic |
| ALIGNMENT_PROGRAM | IMOD |
| BASENAME_ORIGFILE | NA |
| CORRELATED_VOLUME_NAME | wt2_g16.230 |
| CROPPING_COORDINATE1 | , |
| CROPPING_COORDINATE2 | , |
| FIDUCIAL_MARK_FILE | Mar2004DATKOM/WT/WT2/wt2_g16.fid |
| IMAGE_MAP_FILE | wt2_g16_imagemap.tiff |
| RECON_ALGORITHM | R-weighted back projection |
| RECON_DATE | 2003-11-21 00:00:00.0 |
| RECON_DESC | Reconstruction of selectively stained spiny dendrite from single axis tilt tomography |
| RECON_PROGRAM | IMOD |
| RECON_TYPE | single tilt electron tomography |
| THUMBNAIL | P1207/wt2_g16_vt.jpg |
| VOLUME_DIMENSION | 321, 805, 151 |
| VOLUME_NAME | Mar2004DATKOM/WT/WT2/wt2_g16_vol.tar |
| VOXEL_SCALE | , , |
| RECONSTRUCTION_IMAGES_ID | 32 |
| RECON_IMAGE_DESC | Maximum intensity project of a tomographic reconstruction of a spiny dendrite from a 4 ?m thick section throuh medium spiny neuron of mouse caudateputamen |
| RECON_FILE_NAME | Mar2004DATKOM/WT/WT2/wt2_g16_MIP.gif |
| VOLUME_THUMBNAIL | P1207/wt2_g16_vt.jpg |
| ANIMATION_FILE | Mar2004DATKOM/WT/WT2/wt2_g16_rotmovie.qt |
| ANIMATION_DESC | maximum intensity projection of selectively stained spiny dendrite rotated along the y axis |

Segmentation

Segmentation Image -



| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 182 |
| OBJECT_DESC | spiny dendrite with individual spines segmented |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | Mar2004DATKOM/thumbnails/wt2_g16_seg.jpg |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_DESC | Spine necks were manually defined using Analyze image edit functions. Segmentation was then performed using morphology and object definition tools provided by Analyze; segmented objects are contained in the Analyze .obj file |
| SEG_FILE_NAME | Mar2004DATKOM/WT/WT2/wt2_g16_seg.tar |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6456 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6461 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6464 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6470 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6475 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6478 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6455 |
| ANALYSIS_FILE_NAME | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/segmented_object_input_template_wt2_g16.xls |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENTED_OBJ_2D_IMAGE | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_seg.jpg |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |
| SEG_FILE_NAME | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_seg.tar |
| THUMBNAIL | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_seg_thumb.jpg |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6457 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6458 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6459 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6460 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6462 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6463 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6465 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6466 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6474 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6467 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6468 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6469 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6471 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6472 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6473 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6476 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6477 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6479 |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |

| Segmentation - | |
|------------------------|--|
| SEGMENTED_OBJECT_ID | 6480 |
| ANALYSIS_FILE_NAME | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/segmented_object_input_template_wt2_g16.xls |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| ANALYZE_DESC | Surface area, volume, and lengths of the dendritic shaft and individual spines. All partial spines are noted with a "p" - no measurements were taken for these spines. |
| DISPLAY_IMAGE_DESC | A 512 by 512 image of a segmented spiny dendrite. Each spine is individually colored and separated from the shaft. |
| DOWNLOADABLE_FILE_DESC | a .tar file containing the segmented spines and shaft of a spiny dendrite specimen. |
| IS_MANUAL | N |
| LABELING_RANK | none |
| NUMBER_OF_OBJECT | 0 |
| SEGMENTED_OBJ_2D_IMAGE | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_seg.jpg |
| SEGMENT_PERSON_NAME | Masako Terada |
| SEG_ALGORITHM | simple threshold |
| SEG_DESC | Spiny dendrite shaft and dendritic spines |
| SEG_FILE_NAME | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_seg.tar |
| THUMBNAIL | /telescience/home/CCDB_DATA_USER.portal/P1207/Experiment_19/Subject_19/Tissue_35/Microscopy_32/wt2_g16_seg_thumb.jpg |

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ACKNOWLEDGEMENT

Data used from the CCDB should be appropriately referenced, including both the author of the data and the CCDB. If the data were from a published study, the reference is included in the database record. The following reference should be cited for the CCDB:

Martone, M. E., Gupta, A., Wong, M., Qian, X., Sosinsky, G., Ludaescher, B., and Ellisman, M. H. A cell centered database for electron tomographic data. *J. Struct. Biology* 138: 145-155, 2002.

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Maryann Martone