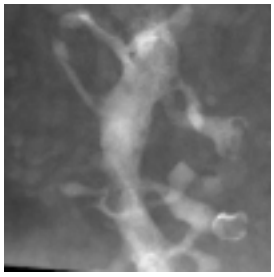
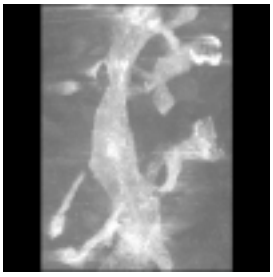
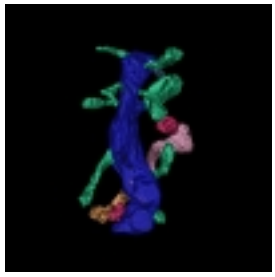
# Cell Centered Database

University of California, San Diego

Maryann Martone

Microscopy Product #:24 oka4

For the most updated information, please visit
http://ccdb.ucsd.edu/CCDBWebSite/main?event=displaySum&mpid=24

| Image2D | Reconstruction | Segmentation |
|---|---|---|
|  |  |  |

## Project Information:

| | |
|---|---|
| PROJECT_ID | P1119 |
| PROJECT_NAME | Correlated Microscopy of Dendritic Spines |
| PROJECT_DESCRIPTION | Measurements of spine parameters using light microscopy and electron tomography |
| LEADER | Maryann Martone |
| FUNDING_AGENCY | NIH |
| PROJECT_START_DATE | 1992-01-01 00:00:00.0 |
| PROJECT_END_DATE | |
| COLLABORATORS | Naoko Yamada; Gordun Arbuthnott; Cali Ingham; Stephen Young |
| PUBLICATION1 | |
| PUBLICATION2 | |
| PUBLICATION3 | |

| Experiment Information - | |
|---|---|
| PURPOSE | whether 3MeV can be used for tomography of very thick sections |
| TITLE | Tomography of spiny dendrite at 3 MeV |
| EXPERIMENTER | Naoko Yamada |
| EXPERIMENT_NAME | |
| EXPERIMENT_DATE | |

| Subject Information - | |
|---|---|
| GROUP_BY | |
| SUBJECT_NAME | control |
| FIXATION_METHOD_ID | |
| SCIENTIFIC_NAME | rattus norvegicus |
| SPECIES | rat |
| STRAIN | Sprague Dawley |
| AGE | |
| AGECLASS | adult |
| ANIMAL_NAME | |
| LITTER_ID | |
| SEX | unspecified |
| VENDOR | |
| WEIGHT | |

| Tissue - | |
|---|---|
| ANATOMIC_LOCATION | neostriatum |
| MICROTOME | ultramicrotome |
| ORIENTATION | coronal |
| THICKNESS | 2 um |
| TISSUE_PROD_STORAGE | |
| EXTERNAL_FILE_NAME | |
| TISSUE_GROUP_TYPE | |

| Microscopy Product Information - | |
|---|---|
| MICROSCOPY_PRODUCT_ID | 24 |
| IMAGE_BASENAME | oka4 |
| CREATE_DATE | |
| INSTRUMENT | Hitachi 1MeV HVEM |
| MICROSCOPE_TYPE | HVEM |
| PLANE_COUNT | 61 |
| PRODUCT_TYPE | single tilt |
| PURL | NA |
| SESSION_NAME | oka4/oka4_seg.jpg |
| TELESCIENCE_SRB | P1119/Experiment_9/Subject_9/Tissue_19/Microscopy_24 |
| X_RESOLUTION | .008 um |
| Y_RESOLUTION | .008 um |
| XSIZE | 1024 |
| YSIZE | 1024 |

## Protocol:

N/A

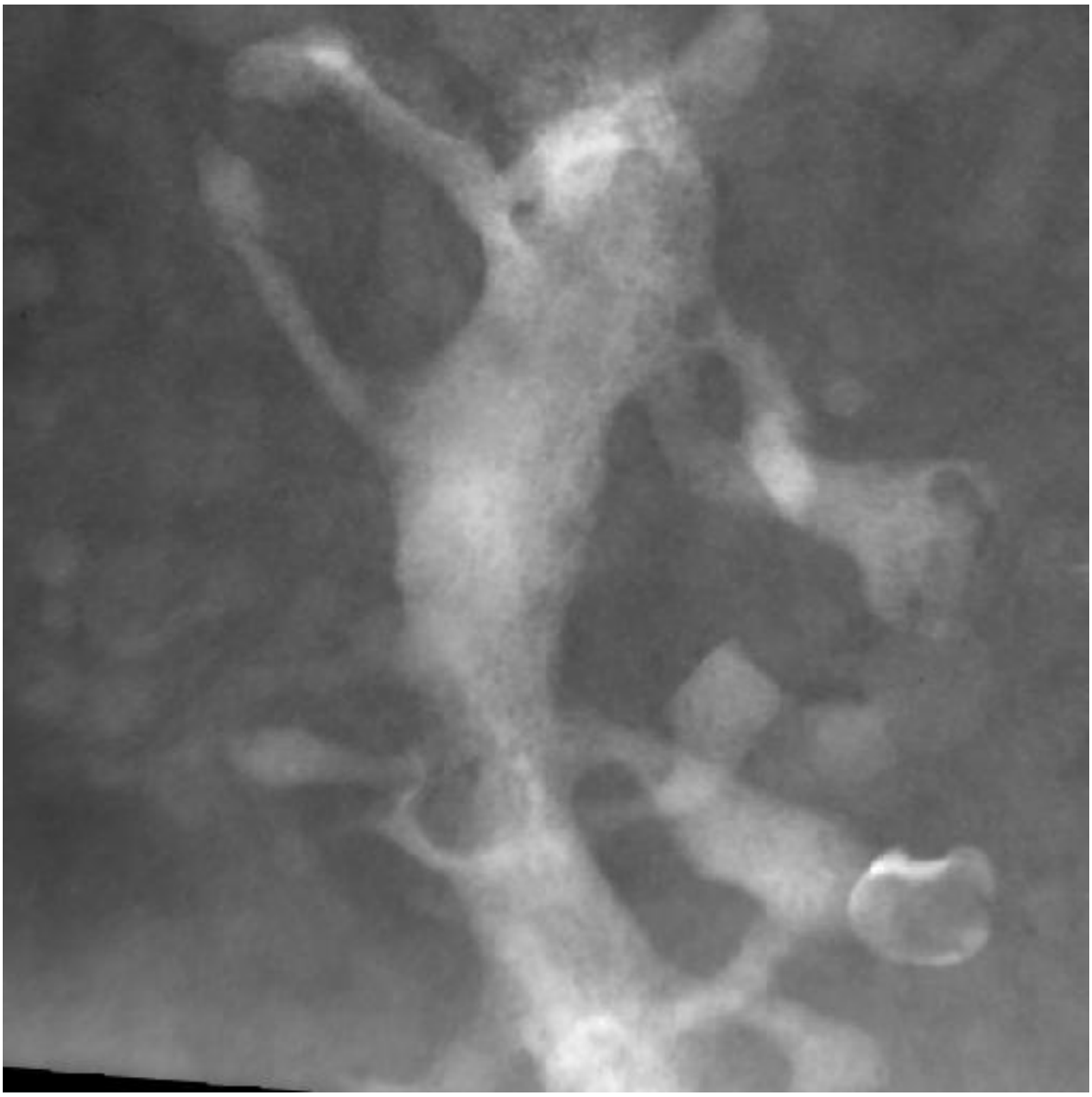
| Image Type - | |
|---|---|
| SINGLE_TILT_IMAGE_SEQ_ID | 6 |
| TILT_INCREMENT | 2 degrees |
| SINGLETILTIMAGESEQ_ID | 6 |
| TILT_INCREMENT | 2 degrees |
| RANGE_MAX | 60 degrees |
| RANGE_MIN | -60 degrees |

| Specimen Description - | |
|---|---|
| ANATOMICAL_DETAIL | 24 |
| ATLAS_COORD | , , |
| CELL_TYPE | medium spiny neuron |
| ORGAN | brain |
| REGION | neostriatum |
| STRUCTURE | spiny dendrite |
| SYSTEM | central nervous system |

| Electron Microscopy Product - | |
|---|---|
| EM_PRODUCT_ID | 6 |
| ACCELERATING_VOLTAGE | 1 MeV |
| MAGNIFICATION | 10000 |
| RECORDING_MEDIUM | film |

## Raw 2D Image

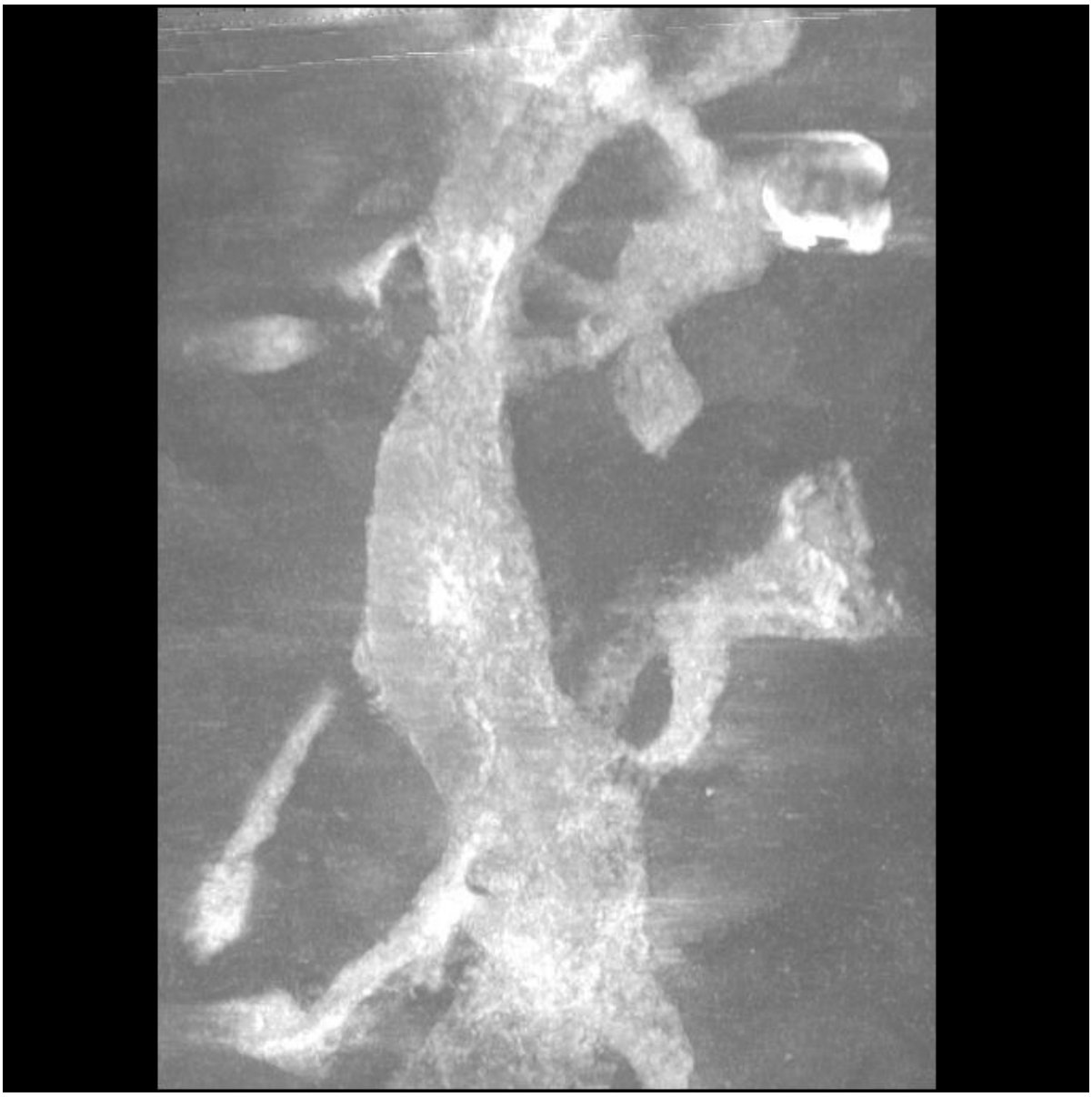
Raw Low Resolution 2D Image -



| Raw 2D Image - | |
|---|---|
| IMAGE2D_ID | 24 |
| IMAGE_FILE_NAME | oka4/oka4_img.jpg |
| MAGNIFICATION | 10000 |
| RAW_ANIMATION_DESC | Aligned and cropped tilt images of a spiny dendrite from a striatal medium spiny neuron that was injected with Lucifer Yellow and then photooxidized |
| RAW_ANIMATION_FILE | oka4/oka4_img.qt |
| RAW_DATA_FILE | oka4/oka4_img.tar |
| THUMBNAIL_DESC | Single tilt image (zero degree tilt) through a 2 um thick section of spiny dendrite from a striatal medium spiny neuron that was injected with Lucifer Yellow and then photooxidized |
| THUMBNAIL_FILE | P1119/oka4_rt.jpg |

## Reconstruction

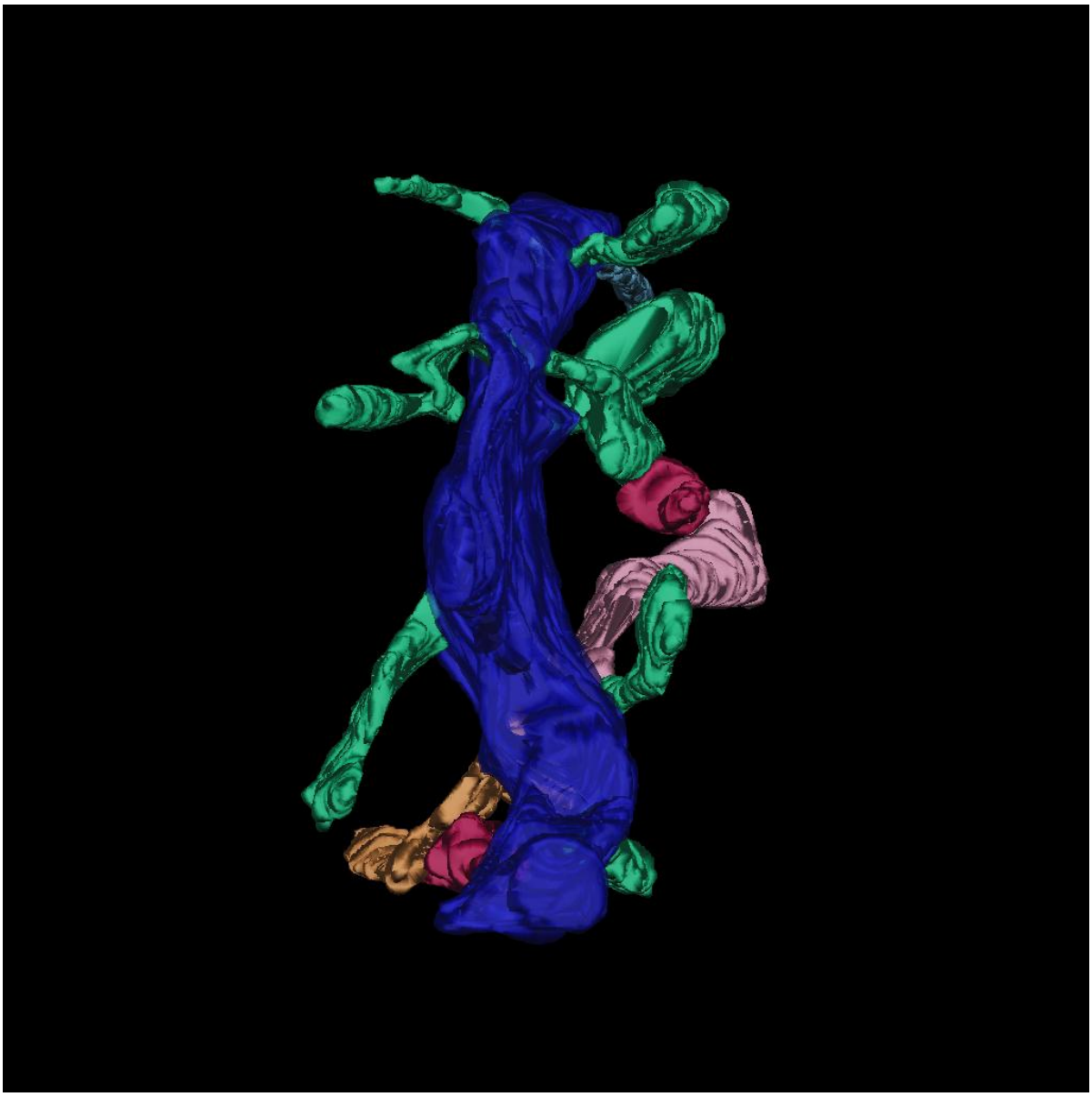
Reconstruction Image -



| Reconstruction - | |
|---|---|
| RECONSTRUCTION3D_ID | 24 |
| ALIGNMENT_PROGRAM | manual |
| BASENAME_ORIGFILE | single tilt |
| CORRELATED_VOLUME_NAME | osaka3/osaka3_vol.tar |
| CROPPING_COORDINATE1 | , |
| CROPPING_COORDINATE2 | , |
| FIDUCIAL_MARK_FILE | xfido |
| RECON_ALGORITHM | R-weighted back projection |
| RECON_DATE | 2000-04-12 00:00:00.0 |
| RECON_DESC | Volume reconstruction of selectively stained spiny dendrite |
| RECON_PROGRAM | Suprim |
| RECON_TYPE | single tilt electron tomography |
| THUMBNAIL | P1119/oka4_vt.jpg |
| VOLUME_DIMENSION | 491, 680, 281 |
| VOLUME_NAME | oka4/oka4_vol.tar |
| VOXEL_SCALE | .008, .008, .008 |
| RECONSTRUCTION_IMAGES_ID | 24 |
| RECON_IMAGE_DESC | maximum intensity projection of tomographic reconstruction of spiny dendrite from rat neostriatum, shot at 10,000X magnification. Contrast is reversed so that stained dendrite appears bright against a dark background |
| RECON_FILE_NAME | oka4/oka4_vol.jpg |
| VOLUME_THUMBNAIL | P1119/oka4_vt.jpg |
| ANIMATION_FILE | oka4/oka4_vol.qt |
| ANIMATION_DESC | maximum intensity projection through spiny dendrite rotated in 5 degrees increments on the y axis. Contrast is reversed so that the stained dendrite appears bright against a dark background |

## Segmentation

Segmentation Image -



| Segmentation - | |
|---|---|
| SEGMENTED_OBJECT_ID | 131 |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1.5 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | Shaft appears to be duplicated |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 131 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace;  surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 4.45866944 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .120267264 um3 |
| SEGMENTED_OBJECT_ID | 132 |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1.7 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | Shaft appears to be duplicated |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 132 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace;  surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 8.32024384 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .281993216 um3 |
| SEGMENTED_OBJECT_ID | 133 |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |

| Segmentation - | |
|---|---|
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 2.4 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp3 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 133 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace;  surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 7.50492288 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .236544 um3 |
| SEGMENTED_OBJECT_ID | 134 |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1.4 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp4 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 134 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace;  surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 4.0404704 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .121845248 um3 |
| SEGMENTED_OBJECT_ID | 135 |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze;  length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1.3 um |

| Segmentation - | |
|---|---|
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp5 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 135 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 3.06891136 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .073539072 um3 |
| SEGMENTED_OBJECT_ID | 136 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1.3 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp6 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 136 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 2.37264448 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .037309952 um3 |
| SEGMENTED_OBJECT_ID | 137 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1.2 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp7 |
| OBJECT_TYPE | surface |
| | |

| Segmentation - | |
|---|---|
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 137 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 2.05496192 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .042701312 um3 |
| SEGMENTED_OBJECT_ID | 138 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 2.8 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp8 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 138 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 8.69546688 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .206657536 um3 |
| SEGMENTED_OBJECT_ID | 139 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1.9 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp9 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 139 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| | |

| Segmentation - | |
|---|---|
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 3.1013472 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .062629376 um3 |
| SEGMENTED_OBJECT_ID | 140 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp10 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 140 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 2.63539776 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .052864512 um3 |
| SEGMENTED_OBJECT_ID | 141 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 1.1 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp11 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 141 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |

Segmentation -

| | |
|---|---|
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 1.13604736 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .015533568 um3 |
| SEGMENTED_OBJECT_ID | 142 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | .7 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp12 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 142 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 2.20348608 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| VOLUME | .017765376 um3 |
| SEGMENTED_OBJECT_ID | 143 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | .5 um |
| OBJECT_DESC | dendritic spine |
| OBJECT_NAME | sp13 |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 143 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| SURFACE_AREA | 1.48383424 um2 |
| THUMBNAIL | P1119/oka4_st.jpg |
| | |

Segmentation -

| | |
|---|---|
| VOLUME | .0283264 um3 |
| SEGMENTED_OBJECT_ID | 144 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| IS_MANUAL | Y |
| LENGTH | 6.896 um |
| OBJECT_DESC | dendritic shaft |
| OBJECT_NAME | shaft |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 144 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| THUMBNAIL | P1119/oka4_st.jpg |
| SEGMENTED_OBJECT_ID | 145 |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| ANALYZE_DESC | SA and Vol measurements from Analyze; length measurements from Xdend |
| LENGTH | 6.896 um |
| OBJECT_DESC | dendritic shaft |
| OBJECT_NAME | shaft |
| OBJECT_TYPE | surface |
| SEGMENTED_OBJ_2D_IMAGE | oka4/oka4_seg.jpg |
| SEGMENTED_OBJECT_ID | 145 |
| SEGMENT_PERSON_NAME | Naoko Yamada |
| SEG_DESC | manual segmentation using Xvoxtrace; surfaced with Synu using Nuage algorithm; tarfile contains all synu objects listed; the associated Viewdata file required by Synu for viewing; and Xvoxtrace file (oka4.trace) used to contour the objects. |
| SEG_FILE_NAME | oka4_seg.tar |
| THUMBNAIL | P1119/oka4_st.jpg |

# USER AGREEMENT

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# USER NOTIFICATION

For large size image data, it will take several minutes to download, please be patient. Thanks!

# 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.

In addition, the support for the Cell Centered Database should be included in the acknolwedgement section of any publication:

The Cell Centered Database is supported by NIH grants from NCRR RR04050, RR RR08605 and the Human Brain Project DA016602 from the National Institute on Drug Abuse, the National Institute of Biomedical Imaging and Bioengineering and the National Institute of Mental Health, and NSF grants supporting the National Partnership for Advanced Computational Infrastructure NSF-ASC 97-5249 and MCB-9728338.

Maryann Martone