Supplementary material

The web page http://www.3dbar.org/wiki/barPossumSupplement contains the most recent versions of the supplementary materials for the article:

A three-dimensional stereotaxic atlas of the gray short-tailed opossum (*Monodelphis domestica*) brain

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ABSTRACT

The gray short-tailed opossum (*Monodelphis domestica*) is a small marsupial gaining recognition as a laboratory animal in biomedical research. Despite numerous studies on opossum neuroanatomy, a consistent and comprehensive neuroanatomical reference for this species is still missing.

Here we present the first three-dimensional, multimodal atlas of the *Monodelphis* opossum brain. It is based on four complementary imaging modalities: high resolution ex-vivo magnetic resonance images, micro-computed tomography scans of the cranium, images of the face of the cutting block, and series of sections stained with Nissl method and for myelinated fibers. Individual imaging modalities were reconstructed into a three-dimensional form and then registered to the MR image by means of affine and deformable registration routines. Based on a superimposition of the 3D images, 113 anatomical structures were demarcated and the volumes of individual regions were measured. The stereotaxic coordinate system was defined using a set of cranial landmarks: interaural line, bregma, and lambda, which allows for easy expression of any location within the brain with respect to the skull. The atlas is released under the Creative Commons license and available through various digital atlasing web services.

The following supplementary materials are available:

Volumes localized in the stereotaxtic reference system

(all volumes are represented at 50?m isotropic resolution)

1. Reference MR brain volume (Download, 14MB),
2. Segmentation of the MR brain volume (Download, 0.8MB; labels description),
3. Blockface volume - affinely coregistered with the reference MR (Download, 16.4MB),
4. Nissl-stained brain volume:
    1. affinely coregistered (Download, 17.1MB),
    2. deformably coregistered with MRI (Download, 16.8MB).
5. Myelin-stained brain volume:
    1. affinely coregistered with MRI (Download, 20.7MB),
    2. deformably coregistered with MRI (Download, 21.7MB),
6. micro-CT skull image (Download, 20.6MB).

Additional online resources

1. Segmentation available via the 3d Brain Atlas Reconstructor Service,
2. Atlas available via the Scalable Brain Atlas web-based display engine for brain atlases,
3. Vatious visualzations of the atlas on Youtube,
4. ItkSnap Website Software for viewing and segmenting three dimensional images.

Other 3D images

(not localized in stereoraxic reference frame)

1. Nissl-stained brain volume affinely registered to MRI (rgb volume, 18.3MB),
2. Nissl-stained brain volume nonlineary registered to MRI (rgb volume, 18.1MB),
3. Nissl to MRI deformation field (Download, 202MB),
4. MRI to Nissl deformation field (Download, 190MB),

5. Myelin-stained brain volume affinely coregistered to MRI (rgb volume, 22.2MB),
6. Myelin-stained brain volume nonlineary coregistered to MRI (rgb volume, 23.2MB),
7. Myelin to MRI deformation field (Download, 264MB),
8. MRI to myelin deformation field (Download, 248MB).