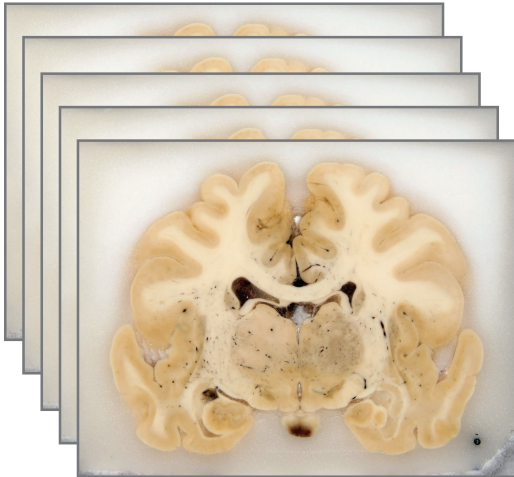


# Image Analysis: 3D Tissue reconstructions

While volume calculation can provide a quantitative endpoint to researchers, having a 3-dimensional volume or surface map rendering of the same tissue that accompanies this data can offer visualization that otherwise might be difficult to picture. This is especially helpful for viewing and comparing smaller portions of tissue in relation to the whole specimen (entire brain or hemisphere), such as tumor or lesion volume reconstructions or renderings of structures within the brain.



Block-face images (shown as an abbreviated series at the top left) are taken during the sectioning process. These images are combined to create a 3D volume rendering of the tissue that can be digitally sliced in any plane (coronal, sagittal, and horizontal shown below).

**Block-face**



**Myelin Stain**



In addition to reconstructing tissue from block-face images, stained tissue can also be used to create volume renderings. Stained tissue reconstructions require a higher than normal frequency of staining in order to render a volume with enough resolution for identifying regions of interest.

In the example shown to the right, coronal, sagittal, and horizontal planes for block-face images as well as Weil-Myelin stained tissue of the same grizzly bear brain are shown. The images at the bottom of each column represent volume renderings of the respective column of images.

By using the block-face images as a template, the Weil-Myelin stained tissue can be matched to corresponding block-face images using linear and non-linear transformations. This transformed stack of images can then be rendered as its own volume.