How to use labeled (indexed) volumes?

How to use labeled volumes available at 3dBAR on-line service website?

You can download two types of volumetric datasets from 3dBAR online. One of them is labeled volume containing all structures from given atlas. If such a volume is available for a chosen atlas, you can download it either from **Live Preview** or **Atlas Details** tab.

The tutorial below demonstrates how to load the labeled volumes along with the appropriate lookup table into ITK-Snap and how to generate polygonal meshes of selected structures. Similar tasks may be performed using other software (e.g. Paraview or 3D Slicer), we have choosen ITK-Snap as we find it lightweight and convenient to use. As an example, we will use the indexed volume of NeuroMaps Macaque monkey brain atlas available from Scalable Brain Atlas.

Steps to follow:

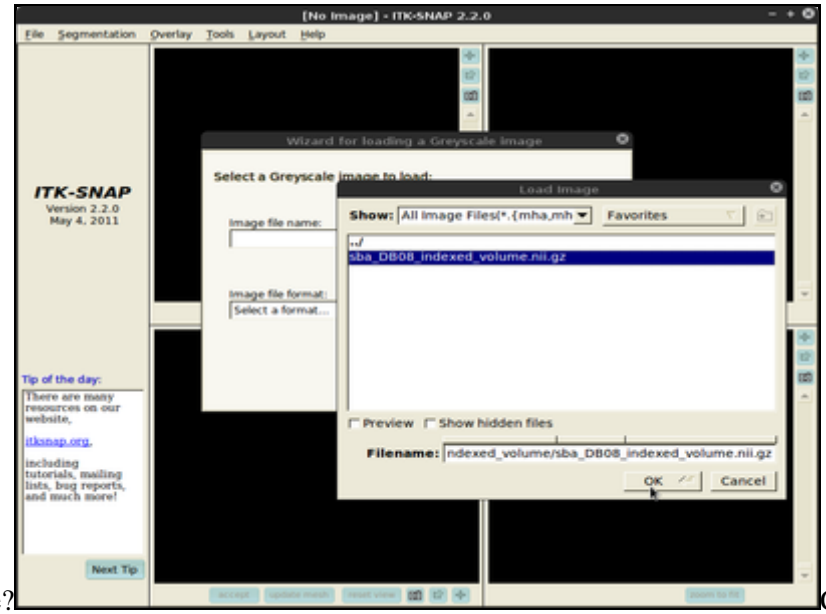
1. Download a zip file with the labeled volume from 3dBAR website and extract its contents. The zipfile contains three files:
    - The indexed volume itself (.nii.gz),
    - A lookup table providing names of structures along with a color map,
    - A short advertisement of off-line 3dBAR tool

    [screenshot with live preview] [screenshot with atlas details]

2. Open ITK-Snap and select **Open Grayscale Image...** from the **File** menu. Then, select the NIfTI volume you extracted. The volume will be loaded as a grayscale image.

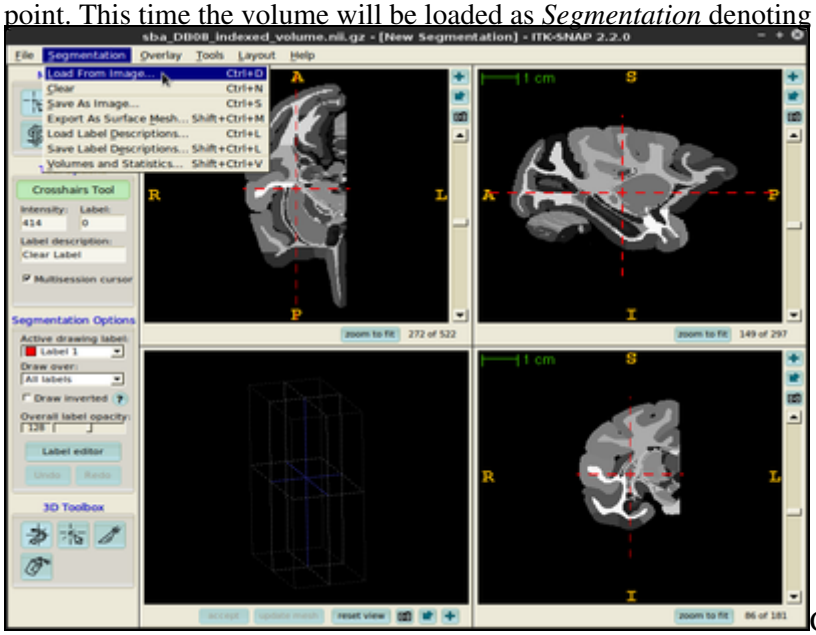


Open Grayscale

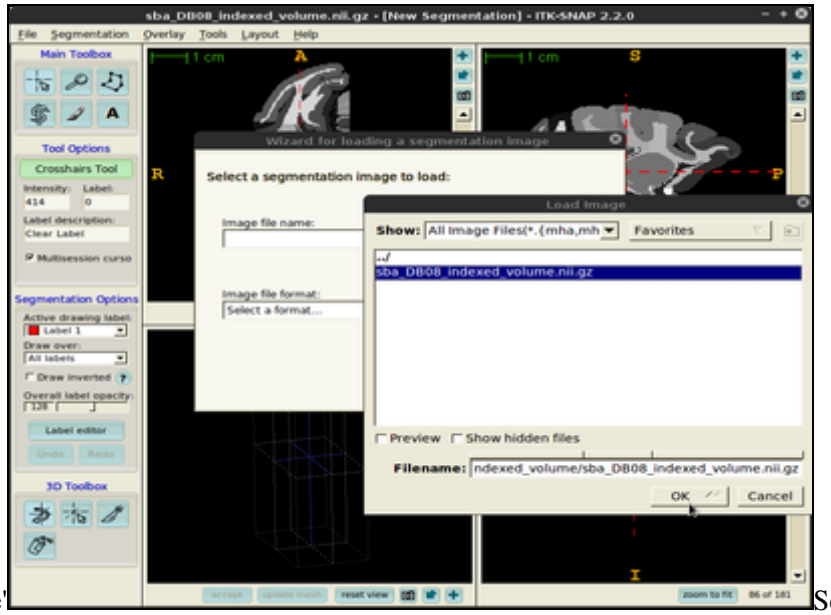


Image? Choose NIfTI volume you extracted

3. Then, choose **Segmentation**, **Load from image** menu and select the same volume file as in the previous point. This time the volume will be loaded as *Segmentation* denoting consecutive structures.

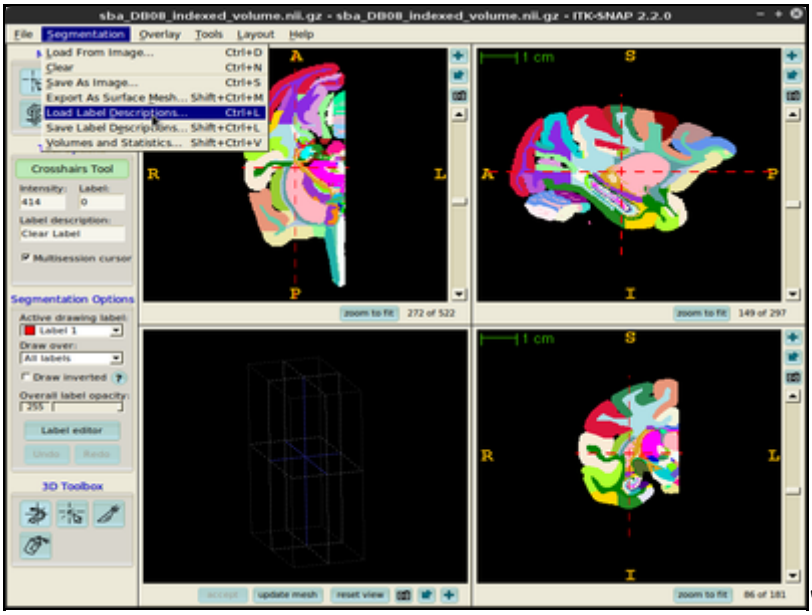


Choose 'Segmentation', then 'Load

from image'

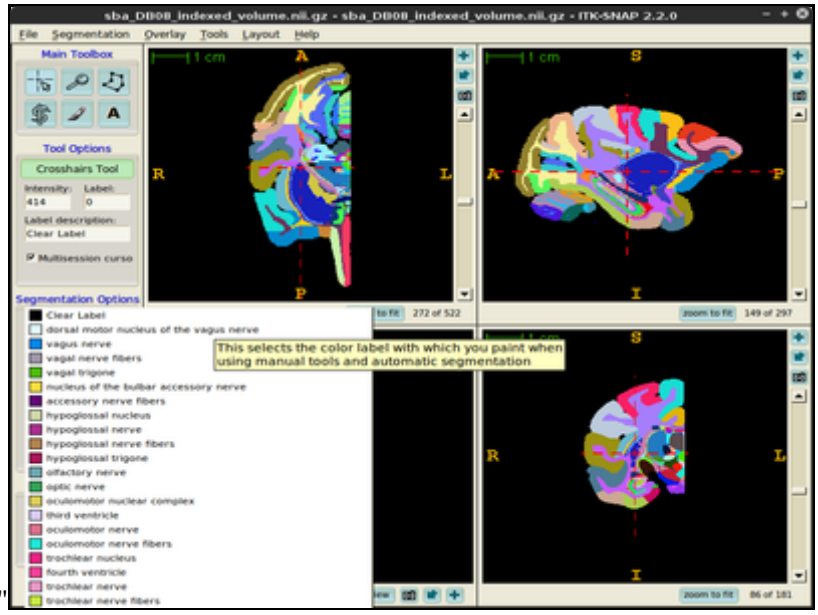
Select the same NIfTI file

4. The next task is to load the lookup table. From the **Segmentation** menu select **Load Label Descriptions...** and select the text file with the lookup table. Now all indexed structures from the *Segmentation* image are linked with appropriate names and segmentation colors.

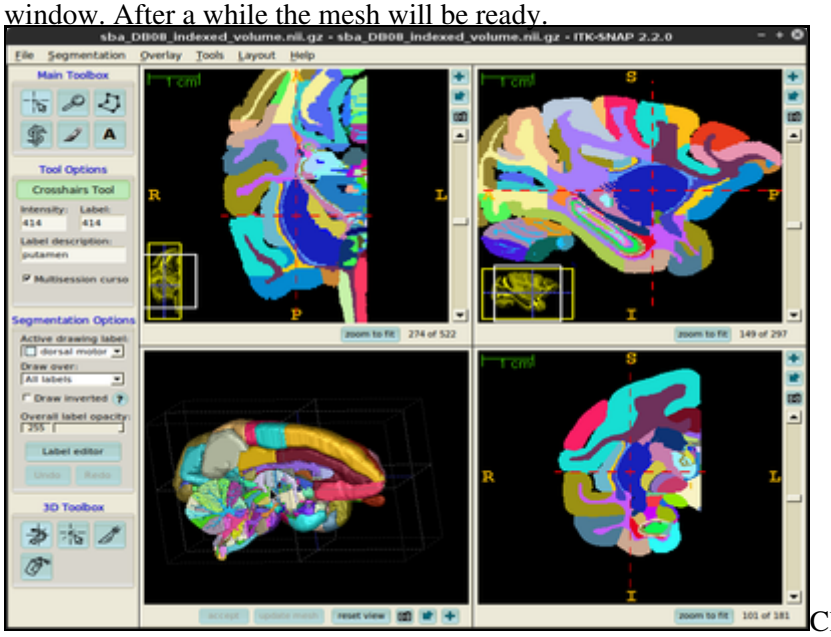


"Segmentation", "Load Label

Descriptions..."

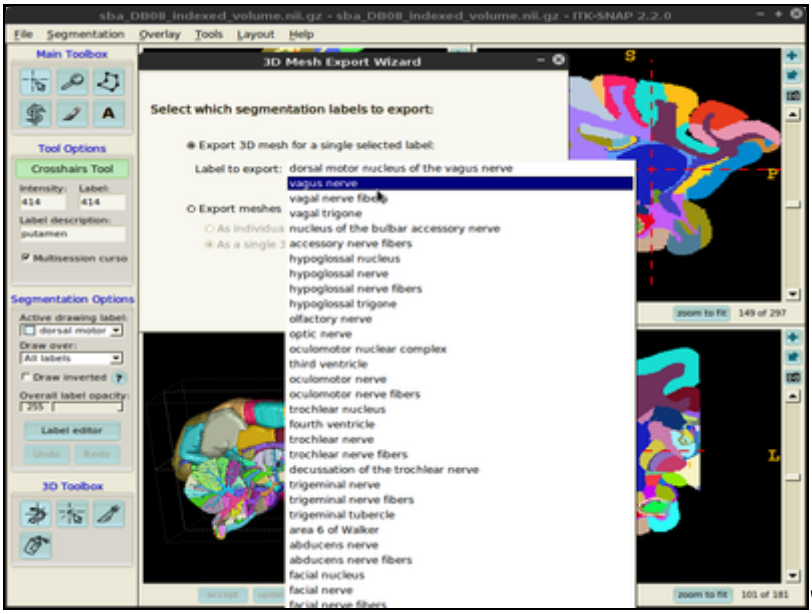


5. In order to generate a surface mesh click **Update mesh** button located at the bottom of the ITK-Snap window. After a while the mesh will be ready.



Click 'update mesh' button

6. You can also export the surface meshes for selected structures (single structure as well as multiple structures in a single file). In order to do this, choose **Segmentation**, **Export As Surface Mesh** and follow the on-screen instructions provided by the **3D Mesh Export Wizard**.



"Segmentation", "Export As Surface Mesh"

7. You can always customize surface mesh generation settings using **Tools -> Display Options -> 3D Rendering** dialogue.

