Quick guide for registration

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This explains how to register the image stack of stained neurons to the standard thoracic ganglion. For registration, not only the neuron but also neuropils in the ganglion should be stained. First, the neuropils image is transformed so that it is aligned to that of standard atlas. Then, the same transformation is applied to the neuron image.
Following is an example of the procedure for the computer running Windows OS and installed with Cygwin (www.cygwin.com) and CMTK toolkit (www.nitrc.org/projects/cmtk/). See the original websites for installation of them.

(1) Preparing images
Download the image stack of the standard thoracic ganglion (e.g. stdTG1_pro.nrrd) from the CNS-PF website.
Convert the neuron and neuropil data into NRRD format. A software such as Fiji (fiji.sc) would be required for re-formatting images. The filenames for these should be the same except that the ends of filename for the neuropil image is "_01", and for the neuron image, "_02" (e.g. "sample_01.nrrd" and "sample_02.nrrd").

(2) Preparing folders
Make a new working folder in Cygwin home directory (e.g. "sample_registration").
Make new two folders inside the working folder and rename them as "ref" and "images".
Put the standard thoracic ganglion file (stdTG1_pro.nrrd) to the "ref" folder, and the neuron and neuropil images to the "images" folder.

(3) Registration
Open Cygwin terminal and change directory to the working folder ("sample_registration").
Run the following command:
munger –b /usr/local/lib/cmtk/bin –a –w –r 0102 –s ref/ stdTG1_pro.nrrd images
This automatically makes a new folder "reformatted" and generates transformed images in it.

(4) Three-dimensional reconstruction
At present, we release image stack data of thoracic ganglia in which neuropil areas are labeled (e.g. stdTG1_pro_labeled.gif). These data can be used for automatic segmentation of neuropil areas in the software for three-dimensional reconstruction.