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3D Reconstruction of Neurons in Vaa3D V.2

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1 Works for me dx.doi.org/10.17504/protocols.io.bdppi5mn

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ABSTRACT

This protocol is used to generate accurate digital representations of neuron morphologies from a variety of brain regions and species. Each reconstruction captures the positions and thicknesses of the soma, dendrites and axon of a biocytin-filled cell within a slice of brain tissue. To generate the reconstruction we use an image stack containing ~200-700 serial 2D images that captures the full extent of the cell within the slice. We use the Vaa3D (Terafly) program with a Kazom's Mozak user interface (Mozak for short) to visualize the 2D images in 3D. Once the stack is loaded in Mozak, our reconstruction is generated by placing nodes in 3D space. The placement of these nodes is dependent on the signal in the images. Our final output, an SWC text file (.swc format), contains many thousand rows. Each row contains a node ID, an x, y, z coordinate, radius value, neurite type, and parent node ID. After tracing is complete, we preform post processing to provide radius values, check for errors and consistency then the SWCs are uploaded into our Laboratory Information Management System.

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ATTACHMENTS

DA0022_3D_Reconstruction_of_Neurons_in_Vaa3d.docx

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