

Using iDISCO to Visualize MORF Labeled Single Neurons in 3D

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SUMMARY

MORF is a method of sparsely labeling a genetically defined population of neurons in vivo, which enables the study of single neuron morphology but meets limitation in visualization intact neuron morphology in thin slices by conventional immunohistochemistry (IHC). Thus, we adopted iDISCO to better visualize the morphology of MORF-labeled single neurons. Applying iDISCO to thick mice brain sections achieved satisfying results in both clearing and immunolabeling, thus enabling the visualization of MORF labeled single neurons with more intact projections.

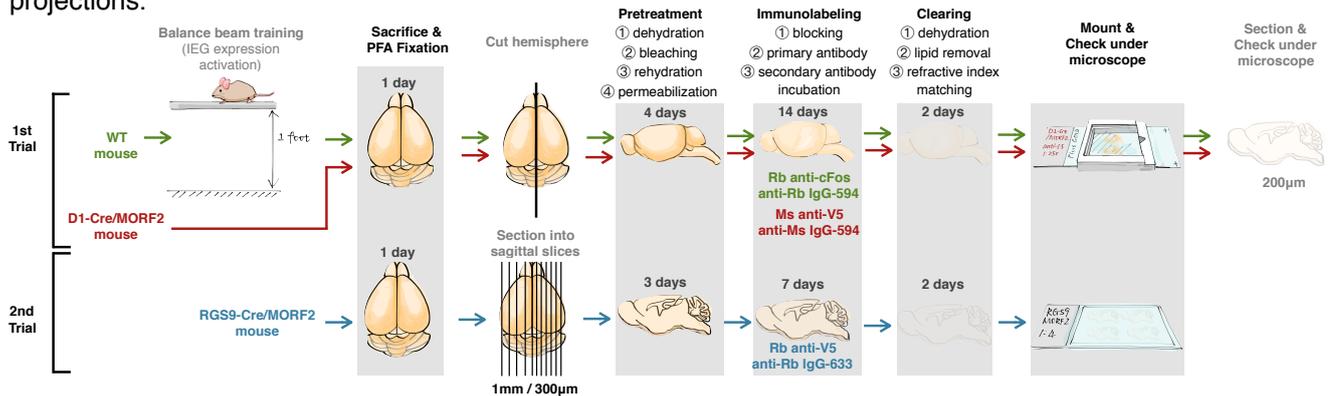


Figure 1. major iDISCO procedure (in grey box) and project workflow

RESULTS

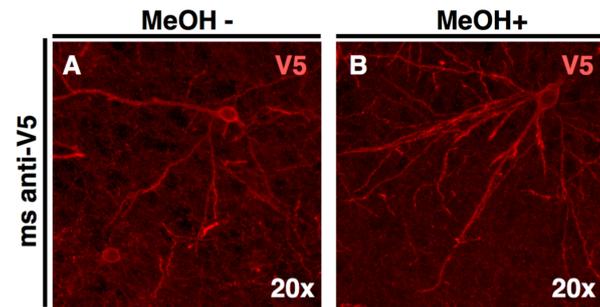


Figure 2. The anti-V5 antibodies are compatible with methanol treatment in IHC

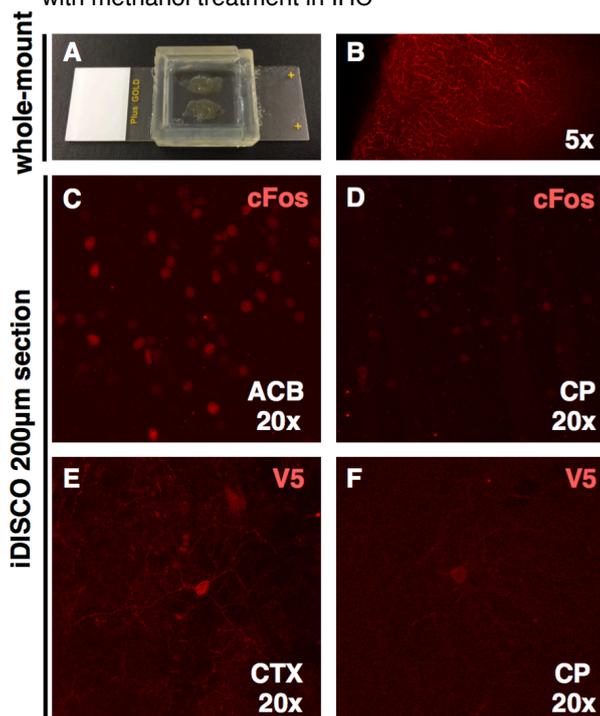


Figure 4. Whole-mount imaging of iDISCO cleared brain hemisphere and later sectioned slices

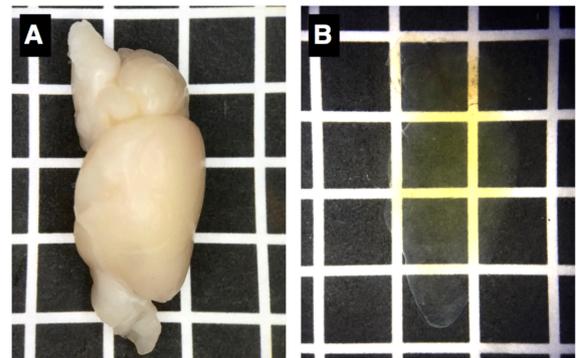


Figure 3. iDISCO turned the mice brain hemisphere transparent after clearing steps

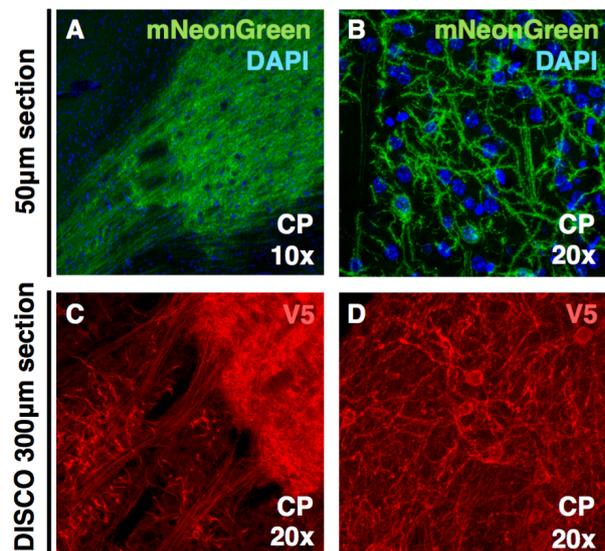


Figure 5. Medium spiny neuron in the dorsal striatum in the thick sections were immunolabeled as clearly as in the thin sections, with more intact projections (A & B credit to Matthew B. Veldman)