

# MASH: a method for scalable cytoarchitectonic characterization of large optically cleared human neocortex samples in 3D

With the introduction of optical clearing in neuroscience, considerable advances in tissue clearing and large volume microscopy have been made<sup>1-4</sup>. However, volume imaging and cytoarchitectonic characterization of large human brain samples, scalable in terms of time and cost to cover a significant portion of a cortical area, has so far remained challenging. This is especially true for adult formalin-fixed tissue. We recently reported on MASH (Multiscale Architectonic Staining of Human cortex)<sup>5</sup>: a scalable nuclear and cytoplasmic labelling and optical clearing approach suitable for 5 mm thick archival, adult human cortex samples. Here we show results of MASH processed brain tissue from the level of visual areas down to the single cell. We also present an economic solution to further scale up this approach for robust and rapid histological processing of an entire human occipital lobe. To this end we build a custom-made cutting device to acquire consistent 5 mm thick coronal slices of an agarose-embedded occipital lobe. Clearing and labelling could be robustly performed in a glass jar with Teflon spacing elements under constant stirring. This is an important step for mapping and cytoarchitectural characterization of entire sub-systems of the human brain in 3D.

## References:

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## Terms and Conditions

Yes

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