

Neuron Morphology Data

Morphology Reconstructions

This website contains two types of neuron morphology, (a) full morphology and (b) partial morphology. Both of them correspond to individual neurons. All neurons' morphologies are registered to the Allen Institute Mouse Brain Common Coordinate Framework version 3 (CCFv3, Wang et al, 2020). The overall workflow is shown in the following figure as extracted from Peng et al (2020). Detail of mouse lines is shown in supplements.

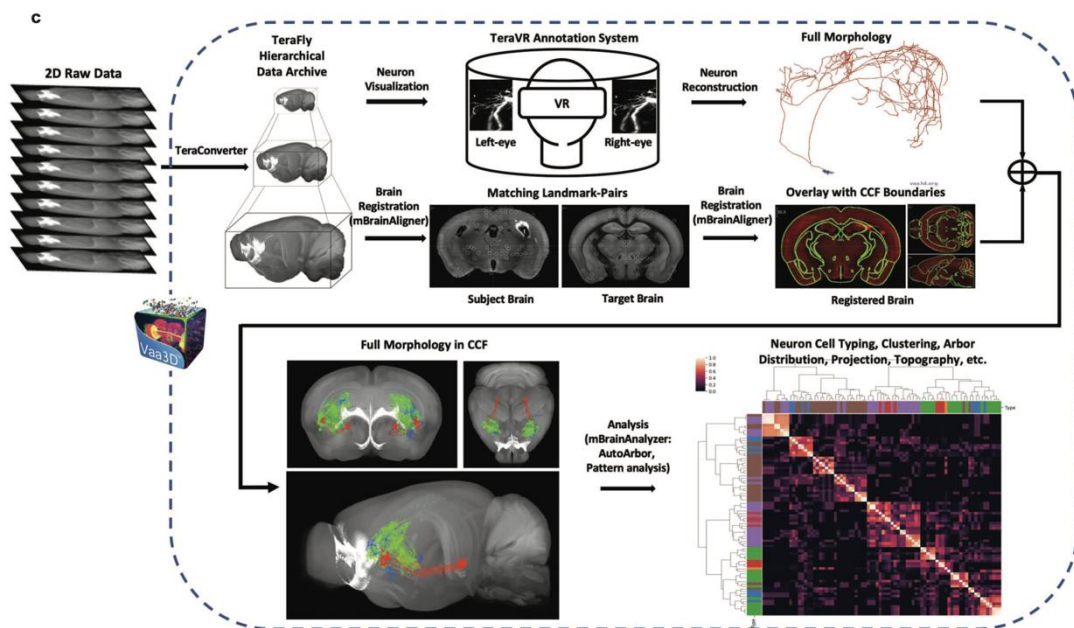


Figure courtesy from Peng et al, (2020) “Brain-wide single neuron reconstruction reveals morphological diversity in molecularly defined striatal, thalamic, cortical and claustral neuron types”.

Full Reconstructions: So far we have documented 1741 full neuron reconstructions produced in the SEU-ALLEN collaboration that is reported in Peng et al (2020), and 1002 full neuron reconstructions generated in the Janelia MouseLight project (Winnubst et al., 2019).

Partial Reconstructions: So far we have documented 10860 dendrite reconstructions generated using automated neuron reconstructions followed by manual curation done by multiple annotators (Jiang et al, 2021).

Extraction of Morphological Features: Vaa3D software (Peng et al, 2010) is used to extract various morphological features of individual neurons. The [min, max] interval of the following five features of the dendritic arbors are considered, including 'Tips' [7, 143], 'Length' [700, 13615],

'Max Path Distance' [108, 1382], 'Average Bifurcation Angle Remote' [35, 129], and 'Max Branch Order' [3, 32].

Mapping to the 'standard' brain / Registration: All neuron reconstructions are registered to the 'standard' atlas space of CCFv3 using mBrainAligner (Qu et al, 2021).

References

1. Vaa3D: Peng et al (2010), Nature Biotechnology, <https://www.nature.com/articles/nbt.1612>
2. mBrainAligner: Qu et al, <https://www.researchsquare.com/article/rs-321118/v1>
3. SEU-ALLEN Full Reconstructions: Peng et al (2020) <https://www.biorxiv.org/content/10.1101/675280v3>
4. MouseLight Full Reconstructions: Winnubst et al., 2019, Cell, [https://www.cell.com/cell/fulltext/S0092-8674\(19\)30842-6](https://www.cell.com/cell/fulltext/S0092-8674(19)30842-6)
5. SEU-ALLEN Partial Reconstructions: Jiang et al, <https://www.biorxiv.org/content/10.1101/2021.01.09.426010v1>
6. CCFv3: Wang et al, Cell, 2020. [https://www.cell.com/cell/fulltext/S0092-8674\(20\)30402-5](https://www.cell.com/cell/fulltext/S0092-8674(20)30402-5)