

Compulsory preparation material

Scientific papers

1. Bjerke I, Øvsthus M, Andersson K, Blixhavn C, Kleven H, Yates S, et al. Navigating the murine brain: Toward best practices for determining and documenting neuroanatomical locations in experimental studies. *Front Neuroanat.* 2018;12: 1–15. [doi:10.3389/FNANA.2018.00082](https://doi.org/10.3389/FNANA.2018.00082)
2. Bjerke I, Øvsthus M, Papp E, Yates S, Silvestri L, Fiorilli J, et al. Data integration through brain atlas: Human Brain Project tools and strategies. *Eur Psychiatry.* 2018;50: 70–76. [doi:10.1016/j.eurpsy.2018.02.004](https://doi.org/10.1016/j.eurpsy.2018.02.004)
3. Puchades MA, Csucs G, Lederberger D, Leergaard TB and Bjaalie JG. Spatial registration of serial microscopic brain images to three-dimensional reference atlases with the QuickNII tool. *PLoS ONE*, 2019, 14(5): e0216796. <https://doi.org/10.1371/journal.pone.0216796>
4. Yates S, Groeneboom N, Coello C, Lichtenthaler S, Kuhn P-H, Demuth H-U, et al. QUINT: Workflow for Quantification and Spatial Analysis of Features in Histological Images From Rodent Brain. *Front Neuroinform.* 2019;13: 1–14. [doi:10.3389/fninf.2019.00075](https://doi.org/10.3389/fninf.2019.00075)
5. Wilkinson M, Dumontier M, Aalbersberg I, Appleton G, Axton M, Baak A, et al. The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data.* 2016;3: 1–9. [doi:10.1038/sdata.2016.18](https://doi.org/10.1038/sdata.2016.18)
6. Bjerke I, Yates S, Laja A, Witter M, Puchades M, Bjaalie J, et al. Densities and numbers of calbindin and parvalbumin positive neurons across the rat and mouse brain. *iScience.* 2021;24: 101906. [doi:10.1016/j.isci.2020.101906](https://doi.org/10.1016/j.isci.2020.101906)
7. Amunts, K., Knoll, A. C., Lippert, T., Pennartz, C. M., Ryvlin, P., Destexhe, A., ... & Bjaalie, J. G. (2019). The Human Brain Project—Synergy between neuroscience, computing, informatics, and brain-inspired technologies. *PLoS biology*, 17(7), e3000344. [doi: 10.1371/journal.pbio.3000344](https://doi.org/10.1371/journal.pbio.3000344)

Software and procedure descriptions

QuickNII - Serial section aligner to volumetric atlases (download software at <https://www.nitrc.org/projects/quicknii/>). Under “Download” select the package called QuickNII-ABAv3-2017.zip. Online documentation: <https://quicknii.readthedocs.io>

VisuAlign - Non linear 2D to 3D image registration (download software at <https://www.nitrc.org/projects/visualign/>). Under “Download” select the package called VisuAlign-v0_9.zip. Online documentation: <https://visualign.readthedocs.io>

ilastik - Interactive image classification, segmentation and analysis (download software and documentation at <https://www.ilastik.org/>)

Nutil - Neuroimaging utilities (download software v.0.8 at <https://www.nitrc.org/projects/nutil/>)

NOTE! Windows only! Online documentation: <https://nutil.readthedocs.io/en/latest/>

MeshView - web application for real-time 3D display of atlas meshes and point clouds

Link : <https://meshview-for-brain-atlases.readthedocs.io>

Choose the link: [Allen Mouse Brain Atlas CCFv3 2017]

(https://meshview.apps.hbp.eu/?atlas=ABA_Mouse_CCFv3_2017_25um) - hierarchical, 670 visible structures, with “root” (transparent at start)

User manual: <https://meshview-for-brain-atlases.readthedocs.io>

Recommended preparation material

1. Groeneboom NE, Yates SC, Puchades MA and Bjaalie JG. Nutil: A Pre- and Post-processing Toolbox for Histological Rodent Brain Section Images. *Front. Neuroinform.* 2020, 14:37. [doi: 10.3389/fninf.2020.00037](https://doi.org/10.3389/fninf.2020.00037)
2. Carey H, Pegios M, Martin L, Saleeba C, Turner A, Everett N, Puchades M, Bjaalie J and McMullan S. DeepSlice: rapid fully automatic registration of mouse brain imaging to a volumetric atlas. *BioRxiv preprint version posted April 30, 2022.* <https://doi.org/10.1101/2022.04.28.489953>
3. Kjonigsen L, Lillehaug S, Bjaalie J, Witter M and Leergaard T. Waxholm Space atlas of the rat brain hippocampal region: Three-dimensional delineations based on magnetic resonance and diffusion tensor imaging. *Neuroimage.* 2015, 108: 441–449. [doi:10.1016/j.neuroimage.2014.12.080](https://doi.org/10.1016/j.neuroimage.2014.12.080)
4. Osen K, Imad J, Wennberg A, Papp E and Leergaard T. Waxholm Space atlas of the rat brain auditory system: Three-dimensional delineations based on structural and diffusion tensor magnetic resonance imaging. *Neuroimage.* 2019, 199: 38–56. [doi:10.1016/j.neuroimage.2019.05.016](https://doi.org/10.1016/j.neuroimage.2019.05.016)
5. Papp E, Leergaard T, Calabrese E, Johnson G and Bjaalie J. Waxholm Space atlas of the Sprague Dawley rat brain. *Neuroimage.* 2014, 97: 374–386. [doi:10.1016/j.neuroimage.2014.04.001](https://doi.org/10.1016/j.neuroimage.2014.04.001)
6. Papp E, Leergaard T, Csucs G and Bjaalie J. Brain-Wide Mapping of Axonal Connections: Workflow for Automated Detection and Spatial Analysis of Labeling in Microscopic Sections. *Front Neuroinform.* 2016, 10: 1–11. [doi:10.3389/fninf.2016.00011](https://doi.org/10.3389/fninf.2016.00011)
7. Bjerke IE, Yates SC, Carey H, Bjaalie JG and Leergaard TB. Scaling up cell-counting efforts in neuroscience through semi-automated methods. *iScience.* 2023, 26(9). <https://doi.org/10.1016/j.isci.2023.107562>

Other:

Next generation rodent brain atlases [Youtube video] Available from https://youtu.be/d-FwWfdDR_8

QUINT workflow [Youtube video] Available from <https://www.youtube.com/watch?v=n-gQigcGMJ0>

Multiscale Integration of Brain Data [Youtube video] Available from <https://youtu.be/atCdA2H45iU>

Interactive exploration of multilevel human brain atlases [Youtube video] Available from https://youtu.be/HL4ki5_PzXo

FAIR data in neuroscience and life sciences: EBRAINS solutions for data publishing [Youtube video] Available from https://www.youtube.com/watch?v=_p_xmAyaIkQ

Kleven, H. & Bjerke, IE (2021) **The critical window for becoming a FAIR researcher** [Blog post] Available from <https://www.incf.org/blog/critical-window-becoming-fair-researcher>