The original human DLPFC and mouse brain data are released on the 10X Visium platform (https://www.10xgenomics.com/resources/datasets), and their processed data are available in the spatialLIBD project (https://github.com/LieberInstitute/spatialLIBD) and Squidpy tutorial (https://squidpy.readthedocs.io/en/stable/auto\_tutorials/tutorial\_visium\_hne.html), respectively. The seqFISH data is usable at https://squidpy.readthedocs.io/en/stable/auto\_tutorials/tutorial\_seqfish.html.

The primary In Situ 10X Xenium breast cancer tumor is deposited at the website https://www.10xgenomics.com/products/xenium-in-situ/preview-dataset-human-breast, and its defined data is available at https://squidpy.readthedocs.io/en/stable/external\_tutorials/tutorial\_xenium.html.

The used 4i data is shown at https://squidpy.readthedocs.io/en/stable/auto\_tutorials/tutorial\_fouri.html, and MIBI-TOF is saved at https://squidpy.readthedocs.io/en/stable/auto\_tutorials/tutorial\_mibitof.html. The Slide-seqV2 is at https://squidpy.readthedocs.io/en/stable/auto\_tutorials/tutorial\_slideseqv2.html. The original MERFISH mouse liver data provides at https://info.vizgen.com/mouse-liver-access. Its pre-processed and annotation workflow is exhibited in Squidpy and the used data in this paper is available at https://squidpy.readthedocs.io/en/stable/external\_tutorials/tutorial\_vizgen\_mouse\_liver.html.