

Purpose:

To provide researchers with a tissue microarray that includes most of the areas and cell types of the human central nervous system.

Tissue samples:

Formalin-fixed, paraffin-embedded non-neoplastic adult tissue, showing no major pathological change, obtained from autopsy specimens, fixed within 36 hours of death. Intact brains are fixed in 20% neutral buffered formalin, after sectioning, tissue samples are fixed in zinc formaldehyde (3.7% formaldehyde) (Z-fix, Anatech, LTD., Battle Creek, MI) for less than 24 hours prior to paraffin embedding.

TMA design and construction:

Each target tissue is captured in two replicate cores from a single individual. Most tissue types were sampled with 1.5 mm needle cores in the original array design. The exception was 1 mm sampling of the pituitary. Pituitary tissue (especially posterior pituitary) proved to be too small a target to reproducibly capture in the histologic sections of the arrays, hence pituitary is the only tissue type not guaranteed to be present on the array sections. Researchers interested in studying this organ are encouraged to submit an application to the CHTN to obtain whole tissue samples or individual whole mount histologic sections.

The CHTN\_CNS2 TMA series was constructed as 4 replicate TMA blocks, designated CHTN\_CNS2A, CHTN\_CNS2B, CHTN\_CNS2C, CHTN\_CNS2D. Each array block is serially sectioned at 4 micron thickness. The histologic sections are placed on charged glass slides (Fisher Plus). At intervals, sections are stained and examined by a pathologist for quality assurance (QA) purposes. The desired tissue type must be present on at least one tissue spot to be scored as adequate. The number of tissue spots in which the desired tissue types resides will vary from section to section.

THE TISSUE SAMPLES HAVE BEEN ANONYMIZED, NO FURTHER DATA ON THE DONORS IS AVAILABLE OTHER THAN THAT FOUND IN THE ACCOMPANYING GUIDE SHEETS.

Guide sheets in Microsoft Excel format and H&E stained whole-slide images representative of the array are available on the CHTN TMA website: <http://chtn.sites.virginia.edu/>.

If despite our efforts you are missing a target tissue type on your array sections that you desire, please contact the CHTN Mid-Atlantic Division at (434)924-9879.

**Frequently asked questions:**

Why aren't all there as many tissue spots on my section of the array as are listed on the TMA key?

The key represents the original TMA design. Tissue cores are of various lengths, hence at deeper sections, some cores have been exhausted while others remain. In addition, some tissue spots may be lost during the process of transferring the TMA section to the glass slide.

Why isn't the target tissue type present in the tissue spot?

Although TMA manufacture is guided by a histologic section that represents the surface of the donor tissue, this target tissue may not be uniformly represented in the deeper sections of the tissue. This problem is greatest with small structures (e.g. breast ducts and lobules).

Why doesn't the representative microscopic image of the target tissue exactly match the tissue spot on my TMA?

The representative images have been taken from a single spot from a single QA section from a single array. Four different replicate TMA blocks were made for this series, each of which has different tissue cores. Even the same tissue core at a deeper section would not exactly match a more superficial section due to the variability inherent in tissue architecture.

Can I use antigen retrieval methods (boiling, microwave, pressure cooker, etc) on these sections?

Yes.

Can I perform *in situ* hybridization on these sections?

Yes.

**Definitions and abbreviations:**

Donor block: a tissue paraffin block (see below) that contains tissue of the desired type to be placed into the tissue microarray.

Histologic section: a flat sheet of paraffin and embedded tissue cut from a paraffin block on a microtome. The thickness of the section can vary, but a typical thickness is 4 microns (micrometers).

QA: quality assurance

Recipient block: The blank paraffin block into which tissue cores are inserted to form the tissue microarray.

Tissue core: the cylindrical tissue sample removed from the donor block, which is placed in the recipient block.

TMA: tissue microarray. A recipient paraffin block into which tissue cores have been inserted in a gridded array.

Tissue paraffin block: a sample of tissue that has been fixed in formalin, processed to remove water, then infused with molten paraffin, which is allowed to harden within and around the tissue in a square mold. This is the standard method of preparing tissue for clinical histologic analysis. The paraffin block is subsequently cut on a microtome to produce thin histologic sections which are placed on glass slides. In the manufacture of TMAs, these become the donor blocks.

Tissue spot: the tissue sample present on a histologic section of a tissue microarray that corresponds to a tissue core.