

Allen Cell Types Database

TECHNICAL WHITE PAPER: CASE QUALIFICATION AND DONOR PROFILES

This database of cell types includes experimental data derived from cells of the adult human brain. The human brain tissue from both postmortem and neurosurgical origin was made available through the generosity of tissue donors. Clinical summaries and donor characteristics are provided in this document, as well as a description of the criteria for acceptance of use in this study.

POSTMORTEM TISSUE DONORS

Postmortem tissue specimens from males and females between 18 – 68 years of age with no known history of neuropsychiatric or neurological conditions ('control' cases) were considered for inclusion in this study of cell transcriptional profiles. Key conditions for exclusion were:

- Known brain injury, cancer or disease
- Known neuropsychiatric or neuropathological history
- Epilepsy or other seizure history
- Drug/alcohol dependency
- > 1 hour on ventilator
- Positive for infectious disease
- Prion disease
- Chronic renal failure
- Death from homicide or suicide
- Sleep apnea
- Time since death (postmortem interval, PMI) > 25 hours

The collection and use of postmortem human brain tissue for research purposes was reviewed by the Western Institutional Review Board (WIRB). WIRB determined that, in accordance with federal regulation 45 CFR 46 and associated guidance, the use of and generation of data from de-identified specimens from deceased individuals did not constitute human subjects research requiring IRB review. All tissue collection was performed in accordance with the provisions of the Uniform Anatomical Gift Act described in Health and Safety Code §§ 7150, et seq., and other applicable state and federal laws and regulations. De-identified postmortem human brain tissue was collected after obtaining permission from decedent next-of-kin. Routine serological screening for infectious disease (HIV, Hepatitis B, and Hepatitis C) was conducted using donor blood samples and only donors negative for all three tests were considered for inclusion in the study. Tissue RNA quality was assessed using an Agilent Bioanalyzer-generated RNA Integrity Number (RIN) and Agilent Bioanalyzer electropherograms for 18S/28S ratios. Specimens with RIN values ≥ 7.0 were considered for inclusion in the study. Summaries of these donors are shown in **Table 1**.

For detailed methodological information regarding these studies, refer to the **Transcriptomics Overview** in the [Documentation](#) section.

NEUROSURGICAL TISSUE DONORS

Tissue procurement from donors undergoing surgery was performed at hospitals, fully outside of the supervision of the Allen Institute. Tissue was provided to researchers under the supervision and authority of the Internal Review Board (IRB) of each participating hospital.

The human neurosurgical tissue donor population includes de-identified patients who underwent a biopsy, craniotomy, or other surgical procedure to diagnose or treat a suspected brain tumor, or for treatment of temporal lobe epilepsies. Surgical tissue from males and females with a range of 18-83 years of age (mean age of 39 years, median age of 36 years) were included in the study. Only tissue specimens deemed not essential for diagnostic purposes and that would otherwise be discarded were collected for research purposes. It was an essential requirement that tissue collection did not interfere in any way with clinical evaluation of the core pathology, or with the health and well-being of the patient beyond the normal risk associated with brain surgery. Summaries of these patients are shown in **Table 1**.

All patients included in the population met with a hospital-appointed surgical case coordinator to review the option of tissue donation and voluntarily signed an IRB-approved Informed Consent Form. Patients who did not wish to participate in tissue donation or who were otherwise unable to provide written consent were excluded from the study.

For detailed methodological information on human surgical tissue handling and processing, refer to the **Electrophysiology Overview** in the [Documentation](#) section.

To establish the anatomical source region associated with a given neurosurgical specimen, the general location of the human brain tissue sample was aligned to an MNI-ICBM152-T1 template. The tissue location was assessed post-surgically by an expert anatomist, based on 3D Stealth MRI images and anatomical landmarks on excised tissue (when photographs were available). For some cases, medical diagnosis and pathological reports were also considered. Finally, the x,y,z coordinates of each located samples were recorded in MNI-ICBM152-T1 template.

Abbreviations: A, Asian; AIAN, American Indian and Alaska Native; AnG (parietal), angular gyrus; C, Caucasian; CM, cavernous malformation; COD, Cause of Death; CV, cardiovascular disease; FroL (frontal), frontal lobe; H, Hispanic; I, Iraqi decent; IFG (frontal), inferior frontal gyrus; ITG, inferior temporal gyrus; ME, Morpho-electric; MFG (frontal), middle frontal gyrus; MTG, middle temporal gyrus; N, neurosurgical; N/A, not applicable; N/Av, not available; NH/NL, non-Hispanic/non-Latino; P, postmortem; PMI, post mortem interval; RIN, RNA integrity number; TemL, temporal lobe; T, transcriptomics.

* **H16.06.010:** H16.06.010.01.01 is in ITG, all other tissue blocks are in MTG.

Table 1. Summary of tissue donations

Specimen ID	Data Type	Tissue Type	Age	Sex	Race	COD	PMI (hr)	Tissue RIN	Brain Region	Hemisphere Sampled	Reason for Surgery	Data Release Date
H200.1023	T	P	43	F	I	Mitral valve prolapse	18.5	7.4 ± 0.7	MTG	L	N/A	10/2017
H200.1025	T	P	50	M	C	CV	24.5	7.6 ± 1.0	MTG	L	N/A	10/2017
H200.1030	T	P	54	M	C	CV	25	7.7 ± 0.8	MTG	L	N/A	10/2017
H16.24.010	T	P	66	M	C	CV	21	7.2 ± 1.4	MTG	L	N/A	10/2017
H16.06.002	T	N	35	F	C	N/A	N/A	7.1 ± 0.9	MTG	R	Epilepsy	10/2017
H16.06.008	T	N	24	F	H	N/A	N/A	8.1 ± 0.8	MTG	L	Epilepsy	10/2017
H16.06.009	T	N	48	F	C	N/A	N/A	7.1	MTG	L	Epilepsy	10/2017
H16.03.004	T	N	25	M	NN	N/A	N/A	8.2 ± 0.8	MTG	R	Tumor removal, epilepsy	10/2017
H15.03.005	ME	N	50	F	C	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H15.03.006	ME	N	24	F	C	N/A	N/A	N/A	ITG	L	Epilepsy	10/2017
H15.06.016	ME	N	27	F	C	N/A	N/A	N/A	IFG (frontal)	R	Tumor removal	10/2017
H15.06.017	ME	N	65	M	A	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H15.06.018	ME	N	19	F	C	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H16.03.001	ME	N	39	M	C	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H16.03.002	ME	N	41	F	N/Av	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H16.03.003	ME	N	25	M	N/Av	N/A	N/A	N/A	FroL (frontal)	R	Epilepsy	10/2017
H16.03.005	ME	N	27	M	N/Av	N/A	N/A	N/A	TemL	R	Epilepsy	10/2017
H16.03.006	ME	N	33	F	N/Av	N/A	N/A	N/A	MTG	R	Epilepsy, CM	10/2017
H16.03.007	ME	N	28	F	C	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H16.03.008	ME	N	31	M	N/Av	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H16.03.009	ME	N	37	M	N/Av	N/A	N/A	N/A	AnG (parietal)	L	Epilepsy	10/2017
H16.03.010	ME	N	48	M	C	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H16.03.011	ME	N	42	M	N/Av	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H16.03.012	ME	N	33	M	C	N/A	N/A	N/A	TemL	R	Epilepsy	10/2017
H16.06.002	ME	N	35	F	C	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H16.06.003	ME	N	31	F	C	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H16.06.004	ME	N	37	M	C	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H16.06.006	ME	N	42	M	C	N/A	N/A	N/A	FroL (frontal)	R	Tumor removal	10/2017
H16.06.007	ME	N	26	M	C	N/A	N/A	N/A	FroL (frontal)	L	Tumor removal	10/2017
H16.06.008	ME	N	24	F	H	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H16.06.009	ME	N	48	F	C	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H16.06.010*	ME	N	67	M	C	N/A	N/A	N/A	ITG, MTG	L	Epilepsy	10/2017
H16.06.011	ME	N	24	F	C	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H16.06.012	ME	N	83	M	NH/NL	N/A	N/A	N/A	MFG (frontal)	R	Tumor removal	10/2017
H17.03.002	ME	N	61	M	N/Av	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H17.03.005	ME	N	60	M	N/Av	N/A	N/A	N/A	MTG	R	Epilepsy	06/2018
H17.03.007	ME	N	27	F	N/Av	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H17.03.008	ME	N	60	F	C	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H17.03.009	ME	N	18	M	N/Av	N/A	N/A	N/A	MTG	R	Epilepsy	10/2017
H17.03.010	ME	N	38	F	N/Av	N/A	N/A	N/A	MTG	L	Epilepsy	06/2018
H17.03.011	ME	N	30	M	N/Av	N/A	N/A	N/A	MTG	R	Epilepsy	06/2018
H17.06.003	ME	N	23	F	NH/NL	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H17.06.004	ME	N	71	F	NH/NL	N/A	N/A	N/A	AnG (parietal)	L	Tumor removal	10/2017
H17.06.005	ME	N	38	M	NH/NL	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H17.06.006	ME	N	35	M	NH/NL	N/A	N/A	N/A	MTG	L	Epilepsy	10/2017
H17.06.007	ME	N	43	F	N/Av	N/A	N/A	N/A	MFG (frontal)	R	Tumor removal	10/2017
H17.06.009	ME	N	52	M	N/Av	N/A	N/A	N/A	TemL	L	Tumor removal	10/2017
H17.06.012	ME	N	23	M	AIAN	N/A	N/A	N/A	MTG	R	Epilepsy	06/2018