

ALLEN Human Brain Atlas

TECHNICAL WHITE PAPER: CASE QUALIFICATION AND DONOR PROFILES

The case review process described here was employed for three components of the ALLEN **Human Brain Atlas**: (1) the Microarray Survey; (2) the Neurotransmitter Study; and (3) the Subcortex Study. Data for all other components of the Allen Human Brain Atlas were generated using banked tissue that underwent a separate screening process (see *In Situ Hybridization in the Allen Human Brain Atlas* white paper).

In general, postmortem tissue from males and females between 18 – 68 years of age and no known history of neuropsychiatric or neurological conditions ('control' cases) were eligible for inclusion in the Microarray Survey, Neurotransmitter Study, and Subcortex Study components of the Allen Human Brain Atlas. Key conditions for exclusion were:

- Brain injury or disease
- Epilepsy
- Drug/alcohol dependency
- > 1 hour on ventilator
- Positive for infectious disease
- Prion disease
- Chronic renal failure
- Cancer deaths
- Brain cancer
- Time since death > 30 hours

Brain tissue, cerebrospinal fluid and blood samples were collected after obtaining informed consent from decedent's next-of-kin. Institutional Review Board (IRB) review and approval was obtained for collection of tissue and non-identifying case information at the tissue banks and repositories that provided tissue for this project. Following tissue collection and freezing, additional tests and quality measures were performed to ensure the tissue and RNA met quality control (QC) criteria, and to rule out any previously undetected conditions incompatible with a 'control' diagnosis.

A Case Review Committee (CRC) of internal and external advisors reviewed all data and approved cases for inclusion in each study. The schematic in Figure 1 shows a timeline of formal CRC activities in relation to availability of screening data. A summary of screening tests and quality control measures and criteria is provided in Table 1. Specific donor profiles are provided in subsequent tables.

For additional detailed methodological information regarding these studies, please access the following technical white papers:

- Microarray Survey in the Allen Human Brain Atlas
- In Situ Hybridization in the Allen Human Brain Atlas

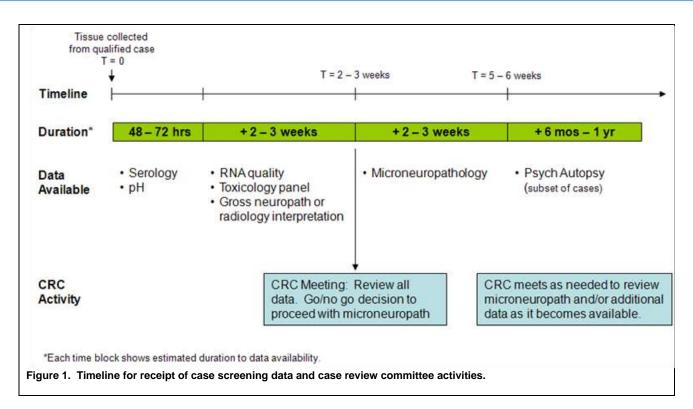


Table 1	Summary	v of case screens	and quality cor	trol tests and criteria.
	Oumman	y or case screens	and quanty cor	

Test	Description	Passing Criteria
Serology	A safety precaution to evaluate blood serum for presence of antigens or antibodies for Hepatitis B, Hepatitis C or HIV1/HIV2.	Negative for all three tests.
рН	Measured in brain tissue homogenate and/or cerebrospinal fluid (CSF). Low pH levels are correlated with poor RNA quality.	pH ≥ 6.0
RNA quality	Assessed using Bioanalyzer-generated RNA Integrity Number (RIN) and Bioanalyzer electropherograms for 18s/28s ratios.	$RIN \ge 6.0$, RNA amount \ge 50ng, no obvious RNA degradation, no noticeable DNA or other contamination.
Toxicology	Postmortem blood is assessed for presence and concentration (when possible) of a broad range of therapeutic drugs and drugs with abuse potential.	Absence of drugs prescribed for neuropsychiatric disorders; absence of drugs at toxicologically significant levels (as reported by testing lab).
Gross neuropathology	Assessment of brain for gross morphological abnormalities indicating neuropathology (e.g. stroke, tumor, atrophy) by a radiologist using MRI data or by a pathologist using digital images of fresh brain sections.	'Normal' assessment by consulting radiologist or pathologist.
Microneuropathology	Analysis of histologically stained tissue sections to assess microscopic indications of pathology such as local ischemic events, abnormal levels of amyloid plaques or neurofibrillary tangles, or indications of abnormal cell morphology.	'Normal' assessment by consulting pathologist.
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able 2. Donor profile: H0351.1009.						
Donor H0351.1009 – Microa	rray Survey, Neuro	otransmitter Study (ISH)				
Tissue Receipt Date	2/8/2011					
Sex	Male					
Age	57 years	57 years				
Race/Ethnicity	Caucasian					
Handedness	Cross-dominant	Cross-dominant				
Postmortem Interval	25.5 hours (estimated time of death to time that tissue is frozen)					
Serology	Pass	Pass				
Toxicology	Positive for caffei significant	Positive for caffeine and theobromine, at levels usually not toxicologically significant				
Tissue pH	6.9 (measured in	frontal pole)				
RNA Quality	Pass	Region Tested	RIN value (Mean ± SD)			
		Frontal poles	6.4 ± 0.4			
		Occipital poles	6.1 ± 0.8			
		Cerebellum (left & right)	7.1 ± 0.5			
		Brainstem	5.6 ± 1.0			
Neuropathology	Gross pathology:	Gross pathology: NormalMicroneuropathology: Normal				
Tissue Received	7 right hemispher 7 cerebellar slabs	12 left hemisphere 1 cm cerebral slabs in coronal orientation 7 right hemisphere cerebral slabs in coronal orientation 7 cerebellar slabs in sagittal orientation; 1 cm thickness 1 brainstem, whole				
Additional Medical Information	History of atheros	History of atherosclerotic cardiovascular disease				
Available Datasets	MRI, DTI, Photo	documentation				
	MRI	Viewable online, avai	Viewable online, available for download			
	Blockface images	s Left hemisphere	Left hemisphere			
	Histology					
	Nissl	mosaic reconstruction	Coronal left hemisphere, intact (6x8) and as mosaic reconstructions from 2x3 sections; individual 2x3 sections			
	SMI-32	2x3 sections	2x3 sections			
	Gene Expressio	n				
	Microarray	~400 samples from le striatum and white ma controls and sample	atter structures, including			
	ISH		88 and 176 genes in subcortex and cortex, respectively; right hemisphere			

Table 2. Donor profile: H0351.1009.

Table 3. Donor profile: H0351.1010.

Donor H0351.1010 – Neurotransmitter Study (ISH)					
Tissue Receipt Date	2/23//2011				
Sex	Male				
Age	26 years				
Race/Ethnicity	Hispanic				
Handedness	Right				
Postmortem Interval	30 hours (estimated time of death to time that tissue is frozen)				
Serology	Pass				
Toxicology	Positive for atropine, caffeine, guaifenesin and theobromine, at levels usually not toxicologically significant				
Tissue pH	6.6 (measured in frontal pole)				
RNA Quality	Pass	Region	Tested	RIN value (Mean ± SD)	
		Frontal	poles	6.4 ± 0.3	
		Occipita	l poles	6.3 ± 0.6	
		Cerebel	lum (left & right)	6.9 ± 0.4	
		Brainste	m	5.4 ± 0.0	
Neuropathology	Gross pathology: Normal Microneuropathology: Normal, hemosiderosis noted			ted	
Tissue Received	16 left hemisphere 1 cm cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 7 cerebellar slabs in sagittal orientation; 1 cm thickness 1 brainstem, whole			ntation	
Additional Medical Information	No clinically rema	arkable hi	story.		
Available Datasets	Histology				
	Nissl	Neurotransmitter Study histology (2x3)		ly histology (2x3)	
	SMI-32		Neurotransmitter Stud	ly histology (2x3)	
	Gene Expressio	n			
	ISH		88 and 176 genes in respectively; right hen		

SexMaleAge31 yearsRace/EthnicityCaucasianHandednessRightPostmortem Interval17.5 hours (estimated time of death to time that tissue is frozen)BerologyPassToxicologyPositive for atropine, caffeine, ibuprofen and theobromine, at levels usually not toxicologically significantTissue pH6.8 (measured in frontal pole)RNA QualityPassPassRegion TestedRIN value (Mean ± SD)Frontal poles6.3 ± 0.3 0ccipital polesOccipital poles5.8 ± 0.3 0.3 0ceipital polesNeuropathologyGross pathology: Normal Microneuropathology: NormalTissue Received18 left hemisphere 1 cm cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 8 sightal orientation; 1 cm thickness 1 brainstem, wholeAdditional Medical nformationSudden cardiac arrest. Benign spindle cell proliferation and dystrophic calcification in temporal horn of lateral ventricle, ~5 mm, possibly an old choroid plexus infarct or degenerated xanthogranuloma.	able 4. Donor profile: H0351.1012.					
Sex Male Age 31 years Race/Ethnicity Caucasian Handedness Right Postmortem Interval 17.5 hours (estimated time of death to time that tissue is frozen) Serology Pass Positive for atropine, caffeine, ibuprofen and theobromine, at levels usually not toxicologically significant Fissue pH 6.8 (measured in frontal pole) RNA Quality Pass Pass Region Tested RIN value (Mean ± SD) Frontal poles 6.3 ± 0.3 Occipital poles 6.3 ± 0.3 Occipital poles 6.4 ± 0.0 Neuropathology Gross pathology: Normal Microneuropathology: Normal Microneuropathology: Normal Microneuropathology: Normal 18 left hemisphere 1 cm cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 8 cerebellar slabs in a gittal orientation; 1 cm thickness 1 brainsem, whole Additional Medical nformation Sudden cardiac arrest. Benign spindle cell proliferation and dystrophic calcification in temporal horn of lateral ventricle, -5 mm, possibly an old choroid plexus infart or degenerated xanthogranuloma. Available Datasets MRI, DTI, Photodocumentation MRI, DTI, Photodocumentation MRI, DTI, Photodocumentation </th <th>Donor H0351.1012 – Microar</th> <th>ray Survey, Neuro</th> <th>otransmit</th> <th>ter Study (ISH)</th> <th></th>	Donor H0351.1012 – Microar	ray Survey, Neuro	otransmit	ter Study (ISH)		
Age 31 years Race/Ethnicity Caucasian Handedness Right Postmortem Interval 17.5 hours (estimated time of death to time that tissue is frozen) Serology Pass Foxicology Pass Foxicology Positive for atropine, caffeine, ibuprofen and theobromine, at levels usually not toxicologically significant Fissue pH 6.8 (measured in frontal pole) RNA Quality Pass Region Tested RIN value (Mean ± SD) Frontal poles 6.3 ± 0.3 Occipital poles 5.8 ± 0.3 Cerebellum (left & right) 6.9 ± 0.2 Brainstem 6.4 ± 0.0 Neuropathology Gross pathology: Normal Microneuropathology: Normal It left hemisphere 1 cm cerebral slabs in coronal orientation 8 cerebellar slabs in sagittal orientation, 1 cm thickness 1 brainstem, whole Additional Medical information Sudden carriac arrest. Benign spindle cell proliferation and dystrophic calcification in temporal horn of lateral ventricle, ~5 mm, possibly an old choroid plexus infarct or degenerated xanthogranuloma. Available Datasets MRI, DTI, Photodocumentation MRI, DTI, Photodocumentation Coronal left hemisphere, intact (6x8) and as mosaic reconstructions from 2x3 sections; individual 2x3 secti	Tissue Receipt Date	5/24/2011				
Race/Ethnicity Caucasian Handedness Right Postmortem Interval 17.5 hours (estimated time of death to time that tissue is frozen) Serology Pass Foxicology Pass Foxicology Positive for atropine, caffeine, ibuprofen and theobromine, at levels usually not toxicologically significant Fissue pH 6.8 (measured in frontal pole) RNA Quality Pass Pass Region Tested RIN value (Mean ± SD) Frontal poles 6.3 ± 0.3 Occipital poles 5.8 ± 0.3 Cerebellum (left & right) 6.9 ± 0.2 Brainstem 6.4 ± 0.0 Neuropathology Gross pathology: Normal Microneuropathology: Normal Microneuropathology: Normal Tissue Received 18 left hemisphere 1 cm cerebral slabs in coronal orientation 8 cerebellari slabs in sagittal orientation, 1 cm thickness Additional Medical information Sudden carriac arrest. Benign spindle cell proliferation and dystrophic calification in temporal horn of lateral ventricle, -5 mm, possibly an old choroid plexus infarct or degenerated xanthogranuloma. Available Datasets MRI, DTI, Photodocumentation MRI, DTI, Photodocumentation MRI, DTI, Photodocumentation Missl	Sex	Male				
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Brainstem 6.4 ± 0.0 Brainstem 6.4 ± 0.0 Neuropathology Gross pathology: Normal Microneuropathology: Normal Microneuropathology: Normal Fissue Received 18 left hemisphere 1 cm cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 8 cerebellar slabs in sagittal orientation; 1 cm thickness 1 brainstem, whole Additional Medical nformation Sudden cardiac arrest. Benign spindle cell proliferation and dystrophic calcification in temporal horn of lateral ventricle, ~5 mm, possibly an old choroid plexus infarct or degenerated xanthogranuloma. Available Datasets MRI, DTI, Photodocumentation MRI Viewable online, available for download Blockface images Left hemisphere, intact (6x8) and as mosaic reconstructions from 2x3 sections; individual 2x3 sections SMI-32 2x3 sections Gene Expression ~500 samples from left cerebral, cerebellar and brainstem structures, including controls and sample replicates ISH 88 and 176 genes in subcortex and cortex,			Occipital poles		5.8 ± 0.3	
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Microneuropathology: Normal Tissue Received 18 left hemisphere 1 cm cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 8 cerebellar slabs in sagittal orientation; 1 cm thickness 1 brainstem, whole Additional Medical nformation Sudden cardiac arrest. Benign spindle cell proliferation and dystrophic calcification in temporal horn of lateral ventricle, ~5 mm, possibly an old choroid plexus infarct or degenerated xanthogranuloma. Available Datasets MRI, DTI, Photodocumentation MRI Viewable online, available for download Blockface images Left hemisphere Histology Nissl Nissl Coronal left hemisphere, intact (6x8) and as mosaic reconstructions from 2x3 sections; individual 2x3 sections SMI-32 2x3 sections Gene Expression -500 samples from left cerebral, cerebellar and brainstem structures, including controls and sample replicates ISH 88 and 176 genes in subcortex and cortex,			Brainstem		6.4 ± 0.0	
8 right hemisphere cerebral slabs in coronal orientation 8 cerebellar slabs in sagittal orientation; 1 cm thickness 1 brainstem, whole Additional Medical nformation Sudden cardiac arrest. Benign spindle cell proliferation and dystrophic calcification in temporal horn of lateral ventricle, ~5 mm, possibly an old choroid plexus infarct or degenerated xanthogranuloma. Available Datasets MRI, DTI, Photodocumentation MRI Viewable online, available for download Blockface images Left hemisphere Histology Nissl Nissl Coronal left hemisphere, intact (6x8) and as mosaic reconstructions from 2x3 sections; individual 2x3 sections SMI-32 2x3 sections Gene Expression Microarray Microarray -500 samples from left cerebral, cerebellar and brainstem structures, including controls and sample replicates ISH 88 and 176 genes in subcortex and cortex,	Neuropathology					
nformationcalcification in temporal horn of lateral ventricle, ~5 mm, possibly an old choroid plexus infarct or degenerated xanthogranuloma.Available DatasetsMRI, DTI, PhotodocumentationMRIViewable online, available for download Blockface imagesBlockface imagesLeft hemisphereHistologyNisslNisslCoronal left hemisphere, intact (6x8) and as mosaic reconstructions from 2x3 sections; individual 2x3 sectionsSMI-322x3 sectionsGene ExpressionMicroarrayMicroarray~500 samples from left cerebral, cerebellar and brainstem structures, including controls and sample replicatesISH88 and 176 genes in subcortex and cortex,	Tissue Received	8 right hemisphere cerebral slabs in coronal orientation 8 cerebellar slabs in sagittal orientation; 1 cm thickness			ntation	
MRIViewable online, available for downloadBlockface imagesLeft hemisphereHistologyHistologyNisslCoronal left hemisphere, intact (6x8) and as mosaic reconstructions from 2x3 sections; individual 2x3 sectionsSMI-322x3 sectionsGene ExpressionGene ExpressionMicroarray~500 samples from left cerebral, cerebellar and brainstem structures, including controls and sample replicatesISH88 and 176 genes in subcortex and cortex,	Additional Medical Information	calcification in temporal horn of lateral ventricle, ~5 mm, possibly an old			-5 mm, possibly an old	
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Gene ExpressionMicroarray~500 samples from left cerebral, cerebellar and brainstem structures, including controls and sample replicatesISH88 and 176 genes in subcortex and cortex,		Nissl		mosaic reconstructions from 2x3 sections;		
Microarray~500 samples from left cerebral, cerebellar and brainstem structures, including controls and sample replicatesISH88 and 176 genes in subcortex and cortex,		SMI-32		2x3 sections		
and brainstem structures, including controls and sample replicatesISH88 and 176 genes in subcortex and cortex,		Gene Expressio	n			
0		Microarray		and brainstem structures, including controls		
		ISH				

Table 4. Donor profile: H0351.1012.

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Table 5. Donor profile: H0351.1015.						
Donor H0351.1015 – Microard	ray Survey					
Tissue Receipt Date	10/11/2011					
Sex	Female					
Age	49 years					
Race/Ethnicity	Hispanic					
Handedness	Right					
Postmortem Interval	30 hours (estimat	ed time of death to time that tiss	sue is frozen)			
Serology	Pass					
Toxicology	Positive for caffei	ne, at levels usually not toxicolo	gically significant			
Tissue pH	6.9 (measured in	frontal pole)				
RNA Quality	Pass	RIN value (Mean ± SD)				
		Frontal poles	7.0 ± 0.2			
		Occipital poles	5.8 ± 1.2			
		Cerebellum (left & right)	7.5 ± 0.2			
	Brainstem		6.1 ± 0.4			
Neuropathology	Gross Pathology: Normal Microneuropathology: Normal; modest numbers of hemosiderin laden macrophages noted in Virchow-Robin spaces in parietal and occipital lobes, mild arteriosclerosis					
Tissue Received	16 left hemisphere 1 cm cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 8 cerebellar slabs in sagittal orientation; 1 cm thickness 1 brainstem, whole					
Additional Medical Information	Splenectomy, hypothyroidism treated with Levothroid					
Available Datasets	MRI, DTI, Photoc	locumentation				
	MRI	Viewable online, available fo	r download			
	Blockface images	Left hemisphere				
	Histology					
	Nissl	Coronal left hemisphere, inta reconstructions from 2x3 sec sections				
	SMI-32	2x3 sections				
	Gene Expression	1				
	Microarray	~500 samples from left cereb brainstem structures includin replicates				

Table 5. Donor profile: H0351.1015.

Donor H0351.1016 – Microa	rray Survey, Neuro	otransmit	ter Study (ISH)			
Tissue Receipt Date	10/25/2011					
Sex	Male	Male				
Age	55 years					
Race/Ethnicity	Caucasian	Caucasian				
Handedness	Right					
Postmortem Interval	18 hours (estimated time of death to time that tissue is frozen)					
Serology	Pass	Pass				
Toxicology	Positive for caffei significant	Positive for caffeine and theobromine, at levels usually not toxicologically significant				
Tissue pH	6.8 (measured in	frontal po	ole)			
RNA Quality	Pass	Region Tested		RIN value (Mean ± SD)		
		Frontal poles		6.4 ± 0.5		
		Occipital poles		6.7 ± 0.7		
		Cerebellum (left & right)		7.4 ± 0.3		
		Brainstem		6.6 ± 0.2		
Neuropathology	Gross Pathology: Normal Microneuropathology: Normal					
Tissue Received	16 left hemisphere cerebral slabs in coronal orientation 8 right hemisphere cerebral slabs in coronal orientation 9 cerebellar slabs in sagittal orientation; 1 cm thickness 1 brainstem, whole					
Additional Medical Information	Coronary artery atherosclerosis, prescriptions for clotting and high cholesterol.			clotting and high		
Available Datasets	MRI, DTI, Photo	documer	itation			
	MRI		Viewable online, available for download			
	Blockface images		Left hemisphere			
	Histology					
	Nissl		Coronal left hemisphere, intact (6x8) and as mosaic reconstructions from 2x3 sections; individual 2x3 sections			
	SMI-32		2x3 sections			
	Gene Expressio	n				
	Microarray		-	ft cerebral, cerebellar ires, including controls		
	ISH		88 and 176 genes in respectively; right her	subcortex and cortex, nisphere		

Table 6. Donor profile: H0351.1016.

Table 7. Donor profile: H0351.2001.

Donor H0351.2001 – Microa	rray Survey					
Tissue Receipt Date	7/29/2009					
Sex	Male					
Age	24 years					
Race/Ethnicity	African American	African American				
Handedness	Left					
Postmortem Interval	23 hours (estima	23 hours (estimated time of death to time that tissue is frozen)				
Serology	Pass					
Toxicology	Positive for atropine and caffeine, at levels usually not toxicologically significant					
Tissue pH	6.72					
RNA Quality	Pass	Region Tested	RIN value (Mean ± SD)			
		Frontal poles	7.1 ± 0.4			
		Occipital poles	6.5 ± 0.6			
		Cerebellum (left & right)	8.1 ± 0.4			
		Brainstem	7.1 ± 0.2			
Neuropathology	MRI-based Radiology Report: Normal Microneuropathology: Normal					
Tissue Received	32 cerebral slabs in coronal orientation; 5 mm thickness 20 cerebellar slabs in sagittal orientation; 5 mm thickness 1 brainstem, whole					
Additional Medical Information	History of asthma	à				
Available Datasets	MRI, DTI, Photo	documentation				
	MRI	Viewable online, avai	lable for download			
	DTI Viewable online, avai		ailable for download			
	Histology					
			econstructions from 2x3 k3 sections			
	Gene Expressio	n				
	Microarray	~1000 samples from cerebral, cerebellar a including controls and	nd brainstem structures,			

Table 8. Donor profile: H0351.2002.

Table 8. Donor profile: H0351.2002.						
Donor H0351.2002 – Microar	ray Survey					
Tissue Receipt Date	8/25/2009					
Sex	Male	Male				
Age	39 years	39 years				
Race/Ethnicity	African America	an				
Handedness	Left	Left				
Postmortem Interval	10 hours (estimated time of death to time that tissue is frozen)					
Serology	Pass					
Toxicology			ine, lidocaine and monon not toxicologically signifi			
Tissue pH	6.86					
RNA Quality	Pass	Region Lested		RIN value (Mean ± SD)		
		Frontal	pole (left & right)	7.5 ± 0.2		
		Occipital pole (left & right)		7.1 ± 1.0		
		Cerebellum (left & right)		8.6 ± 0.6		
		Brainstem 7.3 ± 0		7.3 ± 0.0		
Neuropathology	MRI-based Radiology Report: Normal; possible small pituitary adenoma Microneuropathology: Normal; single neurofibrillary tangle in entorhinal cortex					
Tissue Received	25 cerebral slabs in coronal orientation; 5 mm thickness 17 cerebellar slabs in sagittal orientation; 5 mm thickness; 1 broken and irreparable 1 brainstem, whole					
Additional Medical Information	None known					
Available Datasets	MRI, DTI, Phot	odocumer	ntation			
	MRI		Viewable online, available for download			
	DTI		Viewable online, available for download			
	Blockface images		Left and right hemispheres			
	Histology					
	Nissl Full coronal 6x8 sections and full coronal reconstructions from 2x3 sections; individual sections					
	SMI-32	2x3 section	ons			
	Gene Express	ion				
	Microarray ~1,000 samples from > 300 left and right cerel cerebellar and brainstem structures, including p controls and sample replicates					

Table 9. Donor profile H0351.2003 .

Denor H0351.2003 - Subcortex Study Tissue Receipt Date 4/1/2010 Sex Female Age 48 years Race/Ethnicity Caucasian Handedness Right Postmortem Interval 24 hours (estimated time of death to time that tissue is frozen) Serology Pass Toxicology Pass Pass Region Tested RIN value (Mean ± SD) Frontal pole (left & right) Seroing RiN value (Mean ± SD) Frontal pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Midtional Medical Information 6 cerebral slabs in cornal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, anatomy-based cuts Tom <t< th=""><th>Table 9. Donor profile H0351.2003 .</th><th><u></u></th><th></th><th></th><th></th></t<>	Table 9. Donor profile H0351.2003 .	<u></u>					
Sex Female Age 48 years Race/Ethnicity Caucasian Handedness Right Postmortem Interval 24 hours (estimated time of death to time that tissue is frozen) Serology Pass Toxicology Positive for caffeine and theobromine at levels usually not toxicologically significant, acetone (1.6 mg/dL) consistent with low level fasting or diabetes. Tissue pH 6.65 RNA Quality Pass Region Tested RIN value (Mean ± SD) Frontal pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis. Tissue Received 6 cerebral slabs in coronal orientation, average thickness: 7 mm Additional Medical Information MRI, DTI, Photodocumentation MRI Available for download DTI Available for download DTI Available for download DTI Available for download DTI Avail	Donor H0351.2003 – Subcor	tex Study					
Age48 yearsRace/EthnicityCaucasianHandednessRightPostmortem Interval24 hours (estimated time of death to time that tissue is frozen)SerologyPassToxicologyPassToxicologyPassToxicologyPassToxicologyPassSerologyPassToxicologyPassToxicologyPassToxicologyPassTissue pH6.65RNA QualityPassPassRegion TestedRill value (Mean ± SD) Frontal pole (left & right)5.9 ± 0.7 5.9 ± 0.7 Occipital pole (left & right)SerologyReliantermNeuropathologyReliantermMRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis.Tissue Received6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mmAdditional Medical InformationEnlarged heart, history of sleep apnea and morbid obesityAvailable DatasetsMRI, DTI, Photodocumentation Available for downloadDTIAvailable for downloadDTIAvailable for downloadDTIAvailable for downloadHistologyIsslNissl2x3 sectionsCytochrome Oxidase2x3 sectionsCytochrome Oxidase2x3 sectionsCytochrome Oxidase2x3 sectionsCytochrome Oxidase2x3 sectionsC	Tissue Receipt Date	4/1/2010					
Race/Ethnicity Caucasian Handedness Right Postmortem Interval 24 hours (estimated time of death to time that tissue is frozen) Serology Pass Toxicology Pass Tissue pH 6.65 RNA Quality Pass Pass Region Tested Region Tested RIN value (Met sright) Frontal pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; moderate arteriosclerosis and perivascular hemosiderosis. Tisue Received 6 cerebral slabs in coronal ori	Sex	Female	Female				
Handedness Right Postmortem Interval 24 hours (estimated time of death to time that tissue is frozen) Serology Pass Toxicology Positive for caffeine and theobromine at levels usually not toxicologically significant, acetone (1.6 mg/dL) consistent with low level fasting or diabetes. Tissue pH 6.65 RNA Quality Pass Pass Region Tested RIN value (Mean ± SD) Frontal pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis. Tissue Received 6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mm Additional Medical Information Enlarged heart, history of sleep apnea and morbid obesity MRI Available for download DTI Available fo	Age	48 years					
Postmortem Interval 24 hours (estimated time of death to time that tissue is frozen) Serology Pass Toxicology Positive for caffeine and theobromine at levels usually not toxicologically significant, acetone (1.6 mg/dL) consistent with low level fasting or diabetes. Tissue pH 6.65 RNA Quality Pass Region Tested RIN value (Mean ± SD) Frontal pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis. Tissue Received 6 cerebral slabs in coronal orientation, average thickness: 7 mm Additional Medical Information MRI, DTI, Photodocumentation Available Datasets MRI, DTI, Photodocumentation MIC Available for download DTI AchE 2x3 sections Cytochrome Oxidase 2x3 sections Gene Expression ISH Right hypothalamus/amygdala: 10 genes	Race/Ethnicity	Caucasian					
Serology Pass Toxicology Positive for caffeine and theobromine at levels usually not toxicologically significant, acetone (1.6 mg/dL) consistent with low level fasting or diabetes. Tissue pH 6.65 RNA Quality Pass Region Tested RIN value (Mean ± SD) Frontal pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis. Tissue Received 6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mm Additional Medical Information Enlarged heart, history of sleep apnea and morbid obesity Available Datasets MRI. DTI, Photodocumentation MRI Available for download DTI Available for download	Handedness	Right	Right				
Toxicology Positive for caffeine and theobromine at levels usually not toxicologically significant, acetone (1.6 mg/dL) consistent with low level fasting or diabetes. Tissue pH 6.65 RNA Quality Pass Region Tested RIN value (Mean ± SD) Frontal pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis. Cerebellar slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mm Additional Medical Information Enlarged heart, history of sleep apnea and morbid obesity MRI Available for download DTI MRI Available for download DTI MISI 2x3 sections Cytochrome Oxidase 2x3 sections Cytochrome Oxidase 2x3 sections Cytochrome Oxidase 2x3 sections Edite Right hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posterionly to the posterior	Postmortem Interval	24 hours (estimated time of death to time that tissue is frozen)					
significant, acetone (1.6 mg/dL) consistent with low level fasting or diabetes.Tissue pH6.65RNA QualityPassRegion Tested(RIN value) (Mean ± SD) Frontal pole (left & right)5.9 ± 0.7 5.9 ± 0.7 Occipital pole (left & right)5.9 ± 0.7 7.7 ± 0.4 	Serology	Pass					
RNA Quality Pass Region Tested RIN value (Mean ± SD) Frontal pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis. Tissue Received 6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mm Additional Medical Information Enlarged heart, history of sleep apnea and morbid obesity MRI, DTI, Photodocumentation MRI Available Datasets MRI, DTI, Photodocumentation MRI Available for download DTI 2x3 sections Cytochrome Oxidase 2x3 sections Cytochrome Oxidase 2x3 sections Enterspression ISH Right hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior	Toxicology	significant, acetone (1.6 mg/dL) consistent with low level fasting or					
Region Tested (Mean ± SD) Frontal pole (left & right) 5.9 ± 0.7 Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstern 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis. Tissue Received 6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mm Additional Medical Information Enlarged heart, history of sleep apnea and morbid obesity MRI Available for download DTI Available for download DTI Available for download DTI Available for download MRI ZX3 sections AchE 2X3 sections Cytochrome Oxidase 2x3 sections Cytochrome Oxidase 2x3 sections Left subcortical region extending from head of caudate nucleus posteriorly to the posterior	Tissue pH	6.65					
Occipital pole (left & right) 7.7 ± 0.4 Cerebellum (left & right) 8.2 ± 0.3 Brainstem 7.5 ± 0.1 Neuropathology MRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis. 7.5 ± 0.1 Tissue Received 6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mm Additional Medical normality of sleep apnea and morbid obesity Available Datasets MRI, DTI, Photodocumentation WRI MRI Available for download DTI DTI Available for download MRI Missl 2x3 sections Cytochrome Oxidase Cytochrome Oxidase 2x3 sections 10 genes ISH Right hypothalamus/amygdala: 10 genes Left subcortical region extending from head of catudate nucleus posteriorly to the posterior	RNA Quality	Pass	Region Tested				
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Brainstem7.5 ± 0.1NeuropathologyMRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis.7.5 ± 0.1Tissue Received6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mm7.5 ± 0.1Additional Medical InformationEnlarged heart, history of sleep apnea and morbid obesity7.5 ± 0.1Available DatasetsMRI, DTI, Photodocumentation MRIAvailable for downloadDTIAvailable for download10DTIAvailable for download10Histology2x3 sectionsAchE2x3 sectionsCytochrome Oxidase2x3 sectionsGene Expression10 genesISHRight hypothalamus/amygdala: 10 genesLeft subcortical region extending from head of caudate nucleus posteriorly to the posterior			Occipital pole (left & right)		7.7 ± 0.4		
NeuropathologyMRI-based Radiology Report: Normal; incidental 4mm angioma in left thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis.Tissue Received6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mmAdditional Medical InformationEnlarged heart, history of sleep apnea and morbid obesityAvailable DatasetsMRI, DTI, Photodocumentation MRIMRIAvailable for downloadDTIAvailable for downloadHistologyNisslNissl2x3 sections Cytochrome OxidaseGene ExpressionSections Left subcortical region extending from head of caudate nucleus posteriorly to the posterior			Cereb	ellum (left & right)	8.2 ± 0.3		
thalamus Microneuropathology: Normal; moderate arteriosclerosis and perivascular hemosiderosis.Tissue Received6 cerebral slabs in coronal orientation, anatomy-based cuts 10 cerebellar slabs in sagittal orientation, average thickness: 7 mmAdditional Medical InformationEnlarged heart, history of sleep apnea and morbid obesityAvailable DatasetsMRI, DTI, PhotodocumentationMRIAvailable for download DTIDTIAvailable for downloadDTIAvailable for downloadDTIZx3 sectionsAchE2x3 sectionsCytochrome Oxidase2x3 sectionsGene ExpressionISHISHRight hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior			Brainstem		7.5 ± 0.1		
10 cerebellar slabs in sagittal orientation, average thickness: 7 mm Additional Medical Information Enlarged heart, history of sleep apnea and morbid obesity Available Datasets MRI, DTI, Photodocumentation MRI Available for download DTI Available for download DTI Available for download Histology Nissl AchE 2x3 sections Cytochrome Oxidase 2x3 sections Cytochrome Oxidase 2x3 sections ISH Right hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior	Neuropathology	thalamus Microneuropathology: Normal; moderate arteriosclerosis and			-		
Information MRI, DTI, Photodocumentation Available Datasets MRI, DTI, Photodocumentation MRI Available for download DTI Available for download Histology Nissl AchE 2x3 sections Cytochrome Oxidase 2x3 sections Gene Expression ISH Right hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior	Tissue Received						
MRIAvailable for downloadDTIAvailable for downloadHistologyNissl2x3 sectionsAchE2x3 sectionsCytochrome Oxidase2x3 sectionsGene ExpressionISHISHRight hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior		Enlarged heart, history of sleep apnea and morbid obesity			ty		
DTIAvailable for downloadHistologyNissl2x3 sectionsAchE2x3 sectionsCytochrome Oxidase2x3 sectionsGene ExpressionRight hypothalamus/amygdala: 10 genesISHRight hypothalamus/amygdala: 10 genesLeft subcortical region extending from head of caudate nucleus posteriorly to the posterior	Available Datasets	MRI, DTI, Photod	ocumer	ntation			
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Nissl2x3 sectionsAchE2x3 sectionsCytochrome Oxidase2x3 sectionsGene ExpressionISHISHRight hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior		DTI		Available for download			
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Cytochrome Oxidase 2x3 sections Gene Expression Right hypothalamus/amygdala: 10 genes ISH Right hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior		Nissl		2x3 sections			
Gene Expression ISH Right hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior		AchE		2x3 sections			
ISH Right hypothalamus/amygdala: 10 genes Left subcortical region extending from head of caudate nucleus posteriorly to the posterior		Cytochrome Oxida	ase	2x3 sections			
Left subcortical region extending from head of caudate nucleus posteriorly to the posterior		Gene Expression	١				
caudate nucleus posteriorly to the posterior		ISH		Right hypothalamus/amygda	la: 10 genes		
				caudate nucleus posteriorly to the posterior			

Table 9. Donor profile: H0372-006.

Donor H0372-006 – Subcortex StudyTissue Receipt Date12/04/2009SexMaleAge44 yearsRace/EthnicityCaucasian					
Sex Male Age 44 years					
Age 44 years					
Race/Ethnicity Caucasian					
	Caucasian				
Handedness Right	Right				
Postmortem Interval 24 hours (estimated time of death to time	24 hours (estimated time of death to time that tissue is frozen)				
Serology Pass					
	Positive for atropine, caffeine, lidocaine, theobromine, and dextro/levo- methorphan; at levels usually not toxicologically significant				
Tissue pH6.85					
RNA Quality Pass Region Tested	RIN value				
Frontal pole (left &	right) 7.4				
Occipital pole (left	& right) 6.3				
Cerebellum (left &	right) Not sampled				
Brainstem	6.0				
Neuropathology MRI-based Radiology Report: Normal Microneuropathology: Normal					
Tissue Received4 cerebral slabs in coronal orientationSlab thickness: 3.25 - 3.5 mm					
Additional MedicalFlu-like symptoms prior to deathInformationFlu-like symptoms prior to death					
Available Datasets MRI, DTI, Photodocumentation					
MRI Available fe	or download				
DTI Available f	Available for download				
Histology					
Nissl 2x3 section	2x3 sections				
	2x3 sections				
Cytochrome Oxidase 2x3 section	าร				
Gene Expression					
	thalamus/amygdala: 10 genes				
caudate nu	rtical region extending from head of acleus posteriorly to the posterior he substantia nigra: 55 genes				