MacroMicrodissection

2008

Detailed protocol

Only dissected human brain samples are stored. The microdissection is performed on frozen brains and the samples are kept on -70°C.

Requirements:

- short post mortem delay. Brains were removed from the skull within 2-6 h after death
- family consent or medicolegal cases
- family report
- medical report (died in public places), or
- clinical report (died in hospitals)
- pathological report
- tests for: HIV, hepatitis, syphylis, Tb, major drugs
- neuropathological report

Specification of the brain samples

1) Macrodissected human brain areas (in 2.0 ml Eppendorf tubes)

50 different brain regions (representative for the whole brain):

100 mg - 2 g tissue weight

2) Microdisssected human brain nuclei and areas (in 1.5 ml Eppendorf tubes)

130 different brain regions: 100 µg - 100 mg tissue weight

3) Topographically oriented brain tissue blocks

50 different brain regions in about 10 x 20 x 20 mm size ready for cryostat sectioning and in situ hybridization histochemistry

Storage of samples: on -70°C

BrainNet Europe II

Project Co-ordinator:

Prof. Dr. Hans Kretzschmar

Contact:

www.brainnet-europe.org

Network of Excellence funded by the EC in the 6th Framework Program "Life Science"

Content

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Proving of the usefulness of the microdissected brain samples (containing individual brain nuclei) for:

proteomics: minimum tissue weight: 2 mg

High resolution biopolymer FTICR-MS and elemental LA-ICP-MS

Dept. of Chemistry, Univ. of Konstanz, Germany (M. Przybylski)

genomics: minimum tissue weight: 10 mg

DNA chip technology – microarray – gene expression analysis

Max-Planck-Institute of Evol. Anthropol., Leipzig, Germany (S. Pääbo)

National Institute of Mental Health, Bethesda, MD, USA (M.J. Brownstein)

in situ hybridization histochemistry:

Routin technique in our laboratory

Laboratory of Neuromorphology, MTA-Semmelweis Univ., Budapest

Protocols:

Macrodissected human brain samples (n=50)

olfactory bulb	central amygdala	pontine nuclei
frontal cortex	basal amygdala	pontine tegmentum
cingulate cortex	lateral amygdala	parabrachial nuclei
olfactory tubercle	ventral thalamus	cerebellar cortex
nucleus accumbens	hippocampus	cerebellar nuclei
caudate nucleus	habenula	gigantocellular ret. nucleus
somatomotor cortex	lateral geniculate body	vestibular nuclei
septum	rostral central gray	cochlear nuclei
NIST	mamillary body	sensory trigeminal nuclei
somatosensory cortex	substantia nigra	ventrolateral medulla
preoptic area	medial geniculate body	vagal nuclei
globus pallidus	superior colliculus	inferior olive
anterior hypothalamus	dorsal raphe	medullary reticular formation
anterior thalamus	pontine reticular formation	ventral horn
putamen	inferior colliculus	dorsal horn
midline thalamus		
medial-basal hypothalamus		
premamillary region		
dorsolateral hypothalamus		
medial amygdala		

Microdissected human brain samples (n=130)

agranular insular cortex	anteroventral thalamic nucleus	rostral SGC
olfactory bulb	paraventricular thalamic nucl.	superior colliculus
frontal cortex	midline thalamic nuclei	cuneiform nucleus
cingulate cortex	lateral thalamic nucleus	oculomotor nuclei
prelimbic cortex	ventral thalamic nucleus	nucleus ruber
infralimbic cortex	medial habenula	substantia nigra
olfactory tubercle	lateral habenula	interpeduncular nucleus
nucleus accumbens	median eminence	retrorubral field
piriform cortex	arcuate nucleus	medial geniculate body
caudate nucleus	vetromedial nucleus	dorsal SGC
somatomotor cortex	dorsomedial nucleus	lateral SGC
medial septum	perifornical nucleus	dorsal raphe
dorsal septum	dorsolateral Hth area	midbrain raphe
lateral septum	lateral (ventral) Hth area	colliculus inferior
nucleus tractus diagonalis	zona incerta (rostral)	nucl. ret. pontis oralis
NIST	posterior Hth area	pedunculopontine nucleus
medial preoptic nucleus	subparafascicular nucleus	nucl. tegmentalis dorsalis
lateral preoptic area	hippocampus CA1	Barrington nucleus
subfornical organ	hippocampus CA2	locus coeruleus
globus pallidus	hippocampus CA2	subcoeruleus area

supraoptic nucleus	dentate gyrus	parabrachial nuclei
periventricular nucleus	subiculum	lateral lemniscal nuclei
suprachiasmatic nucleus	occipital cortex	medial paralemniscal nucleus
paraventricular nucleus	temporal cortex	nucl. ret. pontis caudalis
anterior hypoth. nucleus	amygdalo-hippocampal area	rostral ventrolateral medulla
lateral hypothalamic area	premamillary nuclei	pontine raphe
somatosensory cortex	supramamillary nucleus	superior olive
putamen	medial mamillary body	medial ventromedial medulla
cortical amygdala	lateral mamillary body	motor trigeminal nucleus
medial amygdala	ventral tegmental area	sensory trigeminal nucl. I.
basal amygdala	zona incerta (caudal)	lateral vestibular nucleus
lateral amygdala	lateral geniculate body	medial vestibular nucleus
central amygdala	intergeniculate leaflet	motor facial nucleus
fundus striati	preoptic area	gigantocellular ret. nucleus
entorhinal cortex	posterior thalamic nucleus	sensory trigeminal nucl. II.

Microdissected human brain samples (n=130) - cont.

cochlear nuclei inferior olive medullary raphe nuclei parvicellular ret. nucleus vermis	nucleus of the solitary tract caudal ventrolateral medulla area postrema NTS (commissural part) sensory trigeminal nucl. III.	spinal cord, dorsal horn spinal cord, ventral horn spinal cord, central gray spinal cord, white matters intermediolat. cell column
cerebellar cortex cerebellar white matter cerebellar nuclei flocculo-nodular lobe C1 cell group	paratrigeminal nucleus peritrigeminal nucleus cuneate nucleus gracile nucleus motor hypoglossal nucleus	

Topographically oriented tissue blocks

cerebral cortex	preoptic area
somatosensory cortex	hypothalamus
somatomotor cortex	lateral hypothalamus
premotor cortex	mamillary body + ventral tegmental area
supplementary cortex	thalamus
frontopolar cortex	- midline nuclei
dorsomedial prefrontal cortex	diencephalon
ventrolateral prefrontal cortex	diencephalon + midbrain
frontal cortex	midbrain
superior frontal cortex	- rostral
cingulate cortex	- caudal
caudal cingulate cortex	- unilateral
intermediate parietal cortex	- central gray + dorsal raphe
superior parietal cortex	midbrain + pineal gland
visuosensory cortex	midbrain + pineal gland + rostral pons
parastriatal cortex	midbrain + rostral pons
temporo-occipital cortex	midbrain + pons
auditory cortex	pons
temporal cortex	- caudal
parahippocampal cortex	- pontine nuclei
cerebral white matter	- pontine tegmentum
olfactory bulb	- pontine tegmentum/locus coeruleus
nucleus of the diagonal band	pons + medulla oblongata
amygdala	sensory ganglion
hippocampus	choroid plexus
hippocampus + amygdala	medulla oblongata
hippocampus + parahippocampal cortex	- rostral
hippocampus + putamen	

nucleus accumbens	- caudal
septum	- dorsal
septum + NIST	- ventral
caudate nucleus	ventrolateral medulla
striatum (caudate-putamen)	- rostral
striatum + pallidum	- caudal
striatum + nucleus accumbens	vagal nuclei
striatum + NIST	lower brainstem
striatum + nucleus basalis	lower brainstem + cerebellar nuclei
striatum + claustrum	cerebellum
putamen	- cortex
putamen + globus pallidus	- vermis
putamen + internal capsule	- hemispheres
putamen + insular cortex	- nuclei
putamen + claustrum	- flocculonodular lobe
putamen + claustrum + insular cortex	- white matter
putamen + claustrum + globus pallidus	spinal cord
globus pallidus	- cervical
pallidum + ventral pallidum	- lumbar
	- sacral
	pituitary gland

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