

# Neurobiology – overview of the human CNS

Italicized regions are represented twice (e.g. SNc is anatomically part of the tegmentum but functionally part of the basal ganglia; reticular formation extends through several areas). \*\*\* = full of subdivisions, see elsewhere.

forebrain (prosencephalon)

telencephalon

## **cerebral cortex**

frontal lobe

primary motor cortex

premotor cortex

prefrontal cortex (dorsolateral, orbitofrontal)

parietal lobe

\*\*\*

occipital lobe

\*\*\*

temporal lobe

\*\*\*

## **hippocampal formation**

hippocampus (cornu ammonis)

subiculum

dentate gyrus

## **basal ganglia**

input nuclei (striatum = neostriatum)<sup>1</sup>

caudate nucleus

putamen

nucleus accumbens

olfactory tubercle

output nuclei

*substantia nigra pars reticulata*

globus pallidus – internal segment

ventral pallidum

intrinsic nuclei

globus pallidus – external segment

subthalamic nucleus

*substantia nigra pars compacta (A9)*

*ventral tegmental area (A10)*

## **amygdala**

corticomedial

basolateral

central nucleus

septal nuclei

medial – ACh to hippocampus

lateral

**nucleus basalis** of Meynert – ACh to neocortex

bed nucleus of the stria terminalis

diencephalon

## **thalamus**

## **hypothalamus**

epithalamus

pineal (unpaired) – driven by SCN, secretes melatonin

habenula nuclei

midbrain (mesencephalon)

tectum

## **superior colliculus**

inferior colliculus

*periaqueductal grey*

*reticular formation*

tegmentum

## **substantia nigra**

red nucleus

magnocellular – gives rise to rubrospinal tract

parvocellular – projects to inferior olivary nucleus

## **ventral tegmental area (A10)**

mesencephalic trigeminal nucleus (V)

Edinger-Westphal nucleus (III)

oculomotor nucleus (III)

trochlear nucleus (IV)

## **dorsal raphe nucleus**

interpeduncular nucleus

parabigeminal nucleus

hindbrain (rhombencephalon)

*reticular formation*

metencephalon

## **pons**

### **locus coeruleus (A6)**

*periaqueductal grey*

nucleus of the lateral lemniscus

trigeminal main sensory nucleus (V)

trigeminal motor nucleus (V)

vestibular nuclei (VIII) (superior, lateral)

abducens nucleus (VI)

spinal trigeminal nucleus (V) (oral nucleus)

facial nucleus (VII)

superior olivary complex

pontine nuclei

pontobulbar nuclei

## **cerebellum**

spinocerebellum

vermis → fastigial nucleus

intermediate hemisphere → nucleus interpositus (comprises globose n. and emboliform n.)

cerebrocerebellum

lateral hemisphere → dentate nucleus

vestibulocerebellum

flocculonodular node (→ fastigial and vestibular nuclei)

myelencephalon

## **medulla**

**inferior olivary nucleus** (principal, dorsal accessory and medial accessory olivary nuclei)

nucleus ambiguus (IX, X, XI)

nucleus tractus solitarius (VII, IX, X)

spinal trigeminal nucleus (V) (oral nucleus)

cochlear nuclei (VIII) (dorsal, ventral)

vestibular nuclei (VIII) (medial, inferior)

prepositus nucleus

arcuate nucleus

## **raphe nuclei**

spinal cord

<sup>1</sup> ventral striatum = nucleus accumbens + ventromedial portions of the caudate and putamen + olfactory tubercle