

STRICTLY CONFIDENTIAL

10 Questions to be asked in the following order:

1. Name three cell or tissue derivatives of the neural crest that are not neurons?

The melanocytes of the skin, and the bones and muscles of the face, schwann cells

2. The resting membrane potential is determined by the concentrations of three main ions. Name these three ions.

Answer: Sodium, potassium, chloride

3. Botulinum toxin inhibits neurotransmitter release at the neuromuscular junction. What is the molecular target that the toxin acts on.

Answer 3 points = SNARE proteins. Also accept synaptobrevin, syntaxin and SNAP-25 (also accept VAMPs 1,2,3).

4. The 'reward system' in the brain reinforces goal oriented behaviours. Name three structures in the brain that are involved in the reward system.

Answer: VTA (ventral tegmental area), nucleus accumbens, orbitofrontal cortex and medial forebrain bundle, ventral pallidum, PVT (paraventricular nucleus of the thalamus).

5. The blood brain barrier is an important functional feature of the brain. In spite of this some regions lack a blood brain barrier. Name three of these structures.

Answer area postrema, pineal body, subcommissural organ, organum vasculosum laminae terminalis (OVLT), neurohypophysis (or posterior pituitary), median eminence, subfornical organ

6. G-proteins are important for signal transduction. Which molecule is bound to G-proteins when they are in their inactivated basal state?

Answer: GDP, or guanosine diphosphate

7. In the nigro-striatal pathway, the output from the pars compacta can be either excitatory or inhibitory. Name the neurotransmitter involved, the inhibitory receptor and the excitatory receptor.

The projection is excitatory when acting through the D1 receptor but inhibitory when acting through the D2 receptor (on the GABAergic neurons of the striatum).

8. Name 1 main region of the adult mammalian brain where multipotent neural progenitor cells can be found.

Answer: SVZ (subventricular zone); DG (dentate gyrus of the hippocampus); also the SGZ (sub granular zone) and the nucleus accumbens.

9. How do proteins synthesised in the paraventricular nucleus of the hypothalamus reach the anterior pituitary?

Answer: hypothalamo hypophyseal portal vascular system, or via a portal blood vascular system

10. What regions of the developing hindbrain give rise to the cerebellum?

Answer: The isthmus and the first rhombomere (1 mark for rhombic lip).