

**A3.1 Systems Neuroscience**

1. Discuss recent advances in understanding the relationship between inflammation and depression.
2. Discuss the importance of cortical control in the motor system.
3. How much can the study of cognitive impairment in Parkinson's disease tell us about the role of dopamine in cognition?
4. "Central sensitisation is one of the mechanisms underlying forms of chronic pain including inflammatory and neuropathic pain". Provide and discuss experimental evidence supporting this statement.
5. How do the visual responses of neurons in primary visual cortex differ from those of retinal ganglion cells? Discuss what is known about the basis of these differences.

**A3.2 Addiction Biology**

6. Abnormalities in brain systems associated with inhibitory control may predispose some individuals to addiction. How have neuroimaging studies helped detect such abnormalities?
7. Genetic factors influence substance-use behaviour. How might the effect of genes on substance-use behaviour be moderated?
8. What are the behavioural determinants of drug addiction and how best can they be modelled in laboratory animals to develop novel treatments?

**A3.3 Neuropsychology of Mental Health**

9. 'Diagnosing the correct sub-type of dementia is not important, as no effective treatments are available'. Critically appraise this statement.
10. Discuss why new antidepressant treatments are needed, and which strategies have been pursued to achieve this aim.
11. Critically appraise the evidence for the neurodevelopmental hypothesis of schizophrenia.
12. Outline and discuss the theories used to explain the role of the hippocampus in consolidating material in long-term episodic memory.

**A3.4 Neuroimaging**

13. Describe how the fields of structural and functional neuroimaging differ in their methods and in their usage.
14. Discuss the reasons why preclinical neuroimaging helps to bridge the gap between clinical and preclinical research.

**A3.5 Neurodegeneration**

15. What do the gene mutations that cause amyotrophic lateral sclerosis tell us about the disease mechanisms that contribute to motor neuron degeneration?
16. What factors determine whether exogenously-acquired prions pose an ongoing threat to UK public health? Relate the evidence discussed to the biological mechanisms involved in prion disease.