

Part Time MSc Neuroscience Programme 2012 – 2014

Titles for Essay A1

Submission Deadline midday on the 11th January 2013

A1.1 Neuroanatomy

1. Discuss the evidence that ATP is a 'gliotransmitter'.
2. Discuss the importance of commissures in brain function.
3. How relevant are 19th century methods to 21st century neuroscience?
4. How does stereology overcome sampling bias and why is this important for studying the diseased brain?

A1.2 Cell Biology

5. Describe the mechanisms used to achieve apoptosis. How do extracellular signals influence the choice between cell division and apoptosis?
6. Discuss the wide range of roles of the cytoskeleton with respect to central nervous system (CNS) development and CNS disorders.

A1.3 Neurotransmission

7. Describe the mechanisms by which ion channels initiate, mediate and terminate synaptic transmission.
8. Discuss the evidence that variation in nicotinic acetylcholine receptor genes plays a role in epilepsy.

A1.4 Cell signalling

9. Does a knowledge of cell-cell signalling help us understand the normal and pathological functioning of the brain?
10. Discuss the particular importance of G-protein coupled receptors and second messenger systems for signal transduction in the CNS. Include details of their mechanisms of action.
11. Discuss the range of methods by which microRNAs can be delivered to the brain for treatment of brain-associated disease. Detail the relative merits of each.
12. Describe the structure and functions of proBDNF.