

Full Time MSc Neuroscience Programme 2015-2016
Titles for Essay A1
Submission Deadline: 12 October, at 15.00pm

A1.1 Neuroanatomy and neuropathology

1. Discuss the key processes in the development of oligodendrocytes and how these are relevant to Multiple Sclerosis.
2. Discuss current views regarding the origins and routes of axonal pathways carrying motor commands from the cortex to the spinal cord and brainstem.
3. Golgi vs. Cajal: who made the greater contribution to our understanding of the brain? Discuss their relative contributions to the field of neuroscience.

A1.2 Cell Biology

4. Discuss the differences between the mitochondrial dependent pathway and the Bcl-2 family members in the activation of apoptosis.
5. Explain how mitochondria are transported towards synapses via fast axonal transport, with a focus on the specific motor and adaptor proteins.
6. Discuss the role of post translational modification of the protein tau in Alzheimer's disease.

A1.3 Neurotransmission

7. Explain the mechanisms that lead to the resting membrane potential of a neuron, the events that lead to the generation of an action potential and how alterations in potassium channels may alter neuronal excitability.
8. Discuss how local energy availability in the brain affects the sources and removal processes that determine extracellular glutamate concentrations during normal neurotransmission. How are these processes affected when the brain is injured?
9. Discuss how cloning and sequencing of receptor genes has contributed to our understanding of receptors function.

A1.4 Cell signalling

10. Discuss key mechanisms that cells use to transduce signals from other cells.
11. Discuss the role of proBDNF during neural development.