

MSc Neuroscience at the Institute of Psychiatry

2006 Essay titles

Essay I

	Question	Author
1	What are the relative limitations and advantages of using human autopsy material vs. animal models to study neurodegenerative disease?	Jonathan Cooper
2	Compare and contrast the pathological features of Alzheimer's disease and Pick's disease.	Nadeem Khan
3	What are the potential risks of using stem cell grafts for the treatment of CNS diseases and disorders? How might these be overcome?	Helen Hodges
4	Describe the potential therapeutic options for the treatment of the neuronal ceroid lipofuscinoses and which of these options may be suitable for different forms of this disorder.	Jonathan Cooper
5	Review the mechanisms of transduction of axonal guidance signals to the growth cone cytoskeleton.	Jean-Marc Gallo
6	How does Notch signaling mediate Lateral Inhibition? How is this mechanism thought to regulate timing in neurogenesis?	Jack Price
7	Describe the different modes of migration in the developing cerebral cortex; include mechanisms where appropriate.	Brenda Williams

Essay II

	Question	Author
1	Describe the learning algorithms used with 3 different types of artificial neural networks.	Mike Coleman
2	Describe the likely mechanism by which anti-cholinesterases act in the treatment of Alzheimer's disease.	Brian Anderton
3	Of the 30000 or so mammalian genes, roughly 2/3 are of completely unknown function. Discuss some approaches currently used to find the functions of uncharacterised genes and unknown functions of 'known' genes. How many of these would you guess are involved in the development and operation of the central nervous system?	Leo Schalkwyk
4	Describe in detail the functioning of the hypothalamic -pituitary axis. Include a brief description of each of the hormonal systems that are involved	Iain Campbell
5	Compare and contrast, indicating relationships where possible, the phenomenology (biological, genetic, neuropathological), incidence and aetiology of scrapie, CJD and BSE.	Stephen Whatley
6	Describe the various cellular functions that have been proposed for presenilin 1, and discuss how mutations in presenilin 1 may lead to the most aggressive forms of Alzheimer's disease.	Salvador Soriano
7	What is the theoretical basis for the belief that drug discrimination methodology provides animal models for the subjective effects of psychoactive drugs? Discuss whether the evidence from both human and animal experiments supports or refutes such interpretations.	Ian Stolerman
8	Discuss the molecular mechanisms and structural changes that might contribute to long term potentiation at a synapse	John Stephenson

Essay III

	Question	Author
1	"Mood and anxiety disorders have a common neurobiological basis" - Discuss this statement citing evidence for and against from the human, animal and in vitro literature.	John Stephenson
2	Review the evidence for a genetic contribution to personality. Are there any convincing molecular genetic findings linking specific genes to a human personality trait?	John Powell
3	How does molecular imaging contrast with conventional imaging?	Mike Modo

Essay IV

	Question	Author
1	Discuss potential strategies for treating multiple sclerosis, focussing on whether the therapeutic target(s) should be within the CNS or outside the CNS.	David Male
2	RNA splicing and RNA editing are important post-transcriptional events that affect many receptor genes. Discuss how these changes affect receptor function.	Andrew Makoff
3	Microglia are involved in neuroregeneration. Discuss this statement in the context of evidence obtained from studies in vitro and in vivo.	Payam Rezaie