

UNIVERSITY OF LONDON
NEUROSCIENCE MSc EXAMINATION

**For Internal Students of the
INSTITUTE OF PSYCHIATRY
King's College London**

14th January 2013 at 14:00 - 16:30

PAPER A2

Answer FOUR questions only

1. Genome-wide association studies have provided an insight into the genetics of neuropsychiatric disorders. Discuss the successes and failures, using any ONE particular disorder.
2. Describe the model organisms used to study genes and the different ways in which genes can be altered in these model systems, including both quantitative genetics approaches (e.g. breeding strategies) and single gene manipulations (e.g. targeted knockout).
3. In what theoretical and practical ways do genetic linkage and association differ?
4. Explain the term "bidirectional signaling" and give an example of a class of axon guidance molecules where this is observed. What are the consequences of this mechanism regarding the presence of guidance cues on the cells in the nervous system.
5. What have we learnt from animal models of autism spectrum disorders?
6. Compare and contrast the different stem/progenitor cells that exist within the germinal zones of the developing cerebral cortex and how they contribute to neurogenesis.
7. Describe an example of distributed representation in neural networks.
8. What is Hebb's postulate? Discuss whether or not long-term potentiation (LTP) is in agreement with Hebb's postulate.
9. Outline the functions of the cytokines TNF α and IFN γ in the development of inflammation within the CNS.
10. Describe, using specific examples, the different 'types' of microglial activation and their outcomes in the CNS.