

NEUROSCIENCE MSc EXAMINATION

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

9th March 2012 10:00 - 12:30

PAPER B4 Neurodegeneration

Answer FOUR questions only

1. Describe a gene therapy strategy for the treatment of some inherited forms of amyotrophic lateral sclerosis.
2. Is neuroprotection the right strategy for the treatment of Parkinson's disease?
3. Describe the mechanisms thought to be involved in neurodegeneration in multiple sclerosis.
4. Discuss why treatment strategies based on the amyloid cascade hypothesis have so far failed in clinical trials of people with Alzheimer's disease.
5. Which neuroimaging modality is most suitable for structural imaging of the brain in Alzheimer's disease? Why?
6. Describe the genetic basis of Huntington's disease. Using examples, explain some of the pathogenic mechanisms identified from studying this neurodegenerative disorder.
7. (i) Name the major amino acids targeted for phosphorylation by protein kinases.
(ii) Name five key disease-associated proteins that are phosphorylated in any of the following neurodegenerative disorders: Alzheimer's disease, frontotemporal dementia, Parkinson's disease, amyotrophic lateral sclerosis.
(iii) Give three examples of protein kinases that have been implicated in the pathogenesis of the neurodegenerative diseases in (ii). For one of these kinases, describe the evidence for its involvement in disease pathogenesis.
8. Which role(s) have mitochondria in neurodegenerative diseases?