KING'S COLLEGE LONDON

INSTITUTE OF PSYCHIATRY

MSc NEUROSCIENCE EXAMINATION

12th March 2014 at 14.00-16.30pm

Neurodegeneration

B4 WRITTEN EXAMINATION

Answer FOUR questions only

1. The shape of the neuronal cytoskeleton is constantly changing due to reorganisation of microtubule and neurofilament proteins. Discuss the different ways in which the dynamic nature of the cytoskeleton is important for enabling communication between neurons.

2. What is the evidence for a causative role for abnormal tau splicing in neurodegeneration?

3. Do you believe the amyloid cascade hypothesis, and why?

4. Why is Drosophila a good model system to study human neurodegeneration?

5. What is the molecular basis of the inheritance pattern of Huntington's disease? Explain, using examples, some of the pathogenic mechanisms identified from studying this neurodegenerative disorder.

6. Discuss the importance of axonal transport of mitochondria and describe the mechanisms by which mitochondrial transport can become defective in neurodegenerative diseases.

7. Compare and contrast the genetics of Parkinson's and Alzheimer's diseases.

8. What are the four major causative genes for Amyotrophic Lateral Sclerosis (ALS)? Rank each of the four ALS genes in terms of frequency of cases and briefly discuss the biological significance of each.