UNIVERSITY OF TORONTO
Faculty of Arts and Science

APRIL-MAY EXAMINATIONS 2003

NRS 201H1 S
Duration - 3 hours
No Aids Allowed

11 points for each question

1. Review evidence that dopamine and glutamate (and their receptors) are involved in the expression of schizophrenia. Why is it still uncertain whether these chemicals cause schizophrenia?

2. Compare the strengths and weaknesses of positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) methods for visualizing functional activity in the human brain.

3. Circadian rhythms (measured by behavioral activity in hamsters) can be altered by strong light or by arousing stimuli. Describe where circadian cycles are generated in the hypothalamus, when these cycles are altered by light and by arousal, and what neurons and pathways appear to be important.

4. Describe the life cycle of a pyramidal cell that ends up in deep layers of the adult cerebral cortex, from its birth to its fully formed connections with many other neurons in the fully developed brain. What factors can increase or decrease the number of cortical neurons?

5. Review the brain systems and chemicals needed for the performance of unconditioned and conditioned responses to strong footshock in rodents (summarized under the terms "fear and anxiety"). What is the evidence that homologous systems are also important for "anxiety disorders" in humans?

6. Review evidence that CREB (cyclic AMP response-element binding protein) is important for long-term memory and long-term potentiation in animals.