SAMPLE EXAM QUESTIONS

Multiple Choice:

1. An afferent to the striatum contains both DA and a neuroactive peptide. Which of the following statements could be true?
(a) DA and the peptide bind to the same receptor docking site
(b) the peptide might influence the ability of DA to open or close ion gates
(c) DA could act at the level of the ion gates and the peptide at the level of the nucleus
(d) the effects of the peptide might be more long-lasting than those of DA
(e) b + c + d

2. It is possible for a given NT to facilitate and inhibit transmission within a given target neuron because
(a) this statement is impossible
(b) some ion channels can allow either Na_{+} or K_{+} to pass through the same channel
(c) there may be multiple subtypes of the NT's receptor on the same target neuron
(d) different subtypes of a NT's receptor may be linked to fundamentally different transduction mechanisms
(e) c + d

3. Drug X is an indirect agonist at the β-NE receptor and when administered increases blood pressure. β-NE receptor activity is associated with an increase in cAMP production in smooth muscle lining blood vessels. Which of the following properties of Drug Y might be used to counteract the administration of Drug X?
(a) Drug Y acts to increase the conversion of Tyr to L-DOPA (a precursor in the synthesis of NE)
(b) Drug Y acts to decrease the permeability of presynaptic Ca_{+2} channels in the vicinity of the blood vessels
(c) Drug Y acts to increase the rate of breakdown of cAMP within smooth muscle
(d) Drug Y acts as a direct agonist of a neuropeptide that serves as a negative modulator of β-NE receptors
(e) b + c + d

4. A hypothetical disease is thought to be the result of too much DA release in the cortex. Assuming that stimulation of DA afferents produces EPSP's within the cortex and that these DA terminals possess Glu and GABA presynaptic receptors, which of the following could be true?
(a) drugs that reduce high affinity DA reuptake could intensify the disease
(b) an inhibitor of DA biosynthesis could decrease the disease symptoms
(c) a GABA agonist could decrease the disease symptoms
(d) a drug that blocked action potentials within Glu neurons could decrease the disease symptoms
(e) all of the above

Short Answer (these questions must be answered in the space provided)

1. Discuss the opportunities and challenges that the occurrence of multiple receptor subtypes has for the discovery of novel pharmacotherapeutic agents.

2. Describe two different mechanisms in which Drug X might negatively modulate activity of the $GABA_A$ receptor.