NEUR0010
Chemical Control, Motivation, Memory 1

Prepared by Ronnie Li

Chemical Control of Brain and Behavior (Aizenman) Describe what is meant by a "diffuse modulatory system." Where are the cell bodies for these modulatory systems? - Norepinephrine - Serotonin - Dopamine - Acetylcholine LSD resembles which neurotransmitter? Which two areas play a role in reward and addictive behaviors? What neurotransmitter is responsible for this? Drugs like cocaine and amphetamines enhance the effect of which two neurotransmitters? Which type of cells are the first to degenerate in Alzheimer's? Describe the process of hypothalamic control of the posterior pituitary.	

Two major hormones of posterior pituitary Prairie voles/montane voles are monogamous or non-pair-bonding? Which type of voles have more oxytocin and vasopressin receptors in their brains' reward areas? What is the effect of injecting oxytocin receptor *antagonists* into the brains of monogamous voles? What is the effect of increasing vasopressin receptor expression in the brains of montane voles? Describe the process of hypothalamic control of the anterior pituitary. Hormones of the anterior pituitary	

What does the HPA axis stand for? What are the steps in releasing cortisol? When is cortisol released?	
The amygdala excites/inhibits the HPA axis. Describe the effects of chronic stress or excess cortisol on the hippocampus. What evidence is there for this in animals?	
Compare and contrast the sympathetic and parasympathetic systems in terms of: - preganglionic neurotransmitter - postganglionic neurotransmitter - dermatomes in spinal cord - location of ganglia in relation to target organ	

Motivation (McIlwain) DRINKING Two types of thirst - What does each type indicate about the body? - Describe the process of initiating each type - Note: one type of thirst has two "stages." Detail these stages. TEMPERATURE List the heating and cooling mechanisms. Which artery relays information about body temperature to the brain? Which area is the "thermostat" for controlling body temperature? Is temperature regulation an example of positive or negative feedback?	

EATING Lateral and ventromedial hypothalamus: - Pro-feeding or anti-feeding? - What would lesions do? Leptin: pro-feeding or anti-feeding? Where are the receptors located? Ghrelin: pro-feeding or anti-feeding? When is it released? Two circuits: orexigenic and anorectic - Pro-feeding or anti-feeding? - What chemicals do they use? - Do they excite or inhibit the lateral hypothalamus? - Does leptin excite or inhibit each? - Does ghrelin excite or inhibit each? Prader-Willi Syndrome - What is the main finding of people with this disorder in terms of ghrelin levels?	

Name the satiety signals – one chemical is especially important. ***Memory: vertebrate models (Bear)*** Compare and contrast working memory, short term, and long term memory: - small/large capacity? - time duration? - brain area responsible? Outline the pathway of information flow through the hippocampus. Describe the mechanism of LTP. Include the following: - receptors involved? - what's so special about one of the receptors? - what ion is responsible? What can the ion do (2 things)?	

Compare and contrast LTP and LTD: - positive or negative change in synaptic strength? - result of high or low frequency stimulation? - high or low intracellular calcium? - protein kinases or phosphatases involved?	
Describe the BCM theory using a graph. Label your axes and indicate areas of LTP and LTD.	