QUIZ 11 - KEY

Instructions: Download the quiz from Blackboard (in Quiz Questions Folder), print a copy and use the paper copy to work through the various questions and problems. Mark the correct answers on it. When you are ready to **submit** your answers, you will see the quiz posted under Quiz Answer Sheets.

Click the quiz name to launch the quiz. Enter your answers to each of the corresponding numbered questions onto the **blank answer sheet** (the questions will not be repeated, simply a blank page for your answers). The quiz may be saved if you do not finish entering your answers in one sitting. When you are finished with the quiz, make sure to **submit** your answers and they will be recorded.

For each question, select the one **best answer** from among those given (multiple choice). Each question is worth one (1) point.

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1. Which one of the following is correct about Broca's area?

   a) Broca's area processes incoming sounds
   b) Broca's area passes word-based signals to Wernicke's area through hippocampus
   c) Broca's area is important for producing an ordered sequence of words
   d) Broca's area directly controls the movement of lips, tongue, and larynx.
   e) All above are wrong

2. A friend of yours is an intern at the ER without a particularly good bedside manner. She vents to you after getting home from work that she had a particularly frustrating patient today. The patient just wouldn't answer any of her questions! Instead, the patient quickly started rambling nonsense sentences at the end of even simple questions! You, being the astute neurobiology student, have an ideas about why the patient seemed to be confusingly obstinate. Damage to which of the following brain areas do you think could have caused this behavior?

   a) Broca's area
   b) Wernicke's area
   c) Basal ganglia
   d) Cerebellum
   e) Parietal Lobe

Answer Key: This seems like a classical example of Wernicke's aphasia, with trouble in language comprehension and well as logical speech production. Although patients often have trouble responding appropriately in sentences that make sense, they often have no trouble producing speech sounds and/or words.

3. What distinguishes language from other forms of communication?

   a) Language is based only on sound signals.

b) Language features a finite set of sounds that can be combined with infinite possibilities.
c) Language meaning is insensitive to changes in word order.
d) Other forms of communication do not match sound to meaning.
e) All above are wrong

Answer key: A is incorrect because sign language doesn't use sound. B is correct and C is incorrect because language meaning is sensitive to word order. D is wrong because non-language sounds like simple alarm calls convey meaning. E is wrong because although language is easier to acquire in the critical period, it is not impossible to acquire outside of this period of time.

4. We talked about figure 21.7 in your text book in class. This is an experiment where your eyes are fixating on the center of the stimulus, but are cued to attend to a certain sector of the stimulus. What does this experiment suggest about selective attention?

a) It can preferentially enhance brain activity the area of visual cortex corresponding to the sector of the attended stimulus.
b) It can preferentially decrease brain activity the area of visual cortex corresponding to the sector of the attended stimulus.
c) It can enhance brain activity the area of visual cortex corresponding to the whole visual stimulus.
d) It can decrease brain activity the area of visual cortex corresponding to the whole visual stimulus.
e) All above are wrong.

Answer key: The answer is A because the study showed that if you fixate on the center of the stimulus and attend to a certain section of the stimulus, that area in the retinotopic map on the visual cortex was more comparatively more active than other areas of the visual cortex.

5. Which on of the following statement is correct?
a) Bottom up attention is initiated in sensory cortex and driven by incoming sensory stimulus
b) Bottom-up attention is initiated in frontal cortex, driven by internal goals
c) Pop-out search is an example of top-down attention
d) Top-down attention is initiated in sensory cortex, driven by stimulus
e) All above are wrong

6. How does attention inside or outside a receptive field affects the response properties of a single neuron in V4?

a) Neural response of that V4 neuron when attention is inside the receptive field is **higher** than when attention is outside the receptive field
b) Neural response of that V4 neuron when attention is outside the receptive field is **lower** than when attention is inside the receptive field

c) Neural response of that V4 neuron does not change no matter where the attention is.
d) All above are wrong

7. Which of the following describes the hemispatial neglect syndrome observed after right posterior parietal lesions? Choose the correct option.

a) Specific types of objects are completely ignored
b) Specific individuals are completely ignored.
c) Everything to one side of the center of gaze is completely ignored.
d) Specific body parts on both sides are completely ignored.
e) All above are wrong

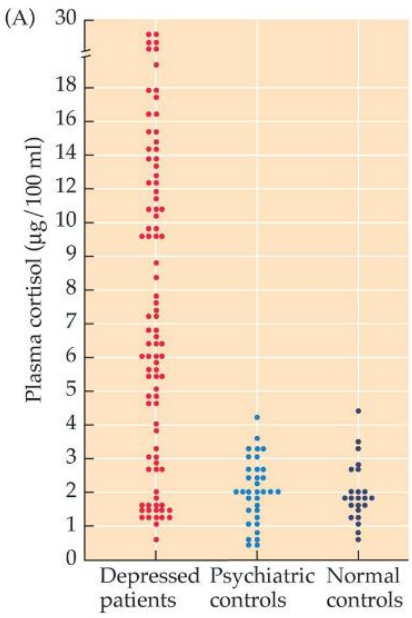
8. Which of the following is true for ALL people who suffer from major depressive disorder?

a) Symptoms arise due to abnormalities of the monaminergic neuromodulators in the brain.
b) Symptoms can be treated using one or a combination of the following drugs: MAOIs, tricyclic antidepressants, SSRIs, SNRIs.
c) Symptoms will include anhedonia and feelings of worthlessness.
d) All of the above are true for ALL people suffering from major depressive disorder.
e) None of the above are true for ALL people suffering from major depressive disorder.

Answer key: Although A-C will potentially be true for many depressive patients, there is an incredible diversity in symptomology and causes for major depression and other mood disorders. As such, it makes it difficult to treat depressives with any particular treatment.

9. Which one of the following statements is correct about stress response?
a) Under stressful conditions, amygdala will not be activated.
b) Under stressful conditions, hypothalamus will secrete cortisol into the blood stream.
c) Under stressful conditions, anterior pituitary will secrete cortisol into the blood stream.
d) Prolonged stress can reduce the neurogenesis in the hippocampus
e) All above are wrong

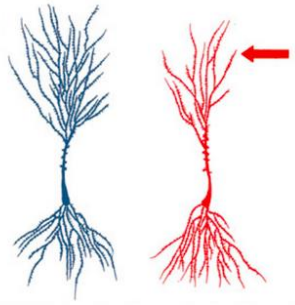
10. Which of the following conclusions can you directly draw from the below figure about depressive patients compared to control patients?



a) Depressed patients always have higher expression of stress hormone receptors.
b) Depressed patients always have impaired feedback regulation of the HPA axis.
c) Depressed patients often have higher levels of activation of the HPA axis.
d) Depressed patients always have hyperactivation of the sympathetic division of the autonomic nervous system.
e) Depressed patients always have more ACTH released from the pituitary gland.

Answer key: This graph shows a broader range and higher overall levels of blood cortisol in depressed patients. This provides direct evidence that there is more HPA axis activity in general, since cortisol is release through activation of the HPA axis, but does not provide direct for the other options; there are multiple mechanisms to increase blood cortisol levels..

11. **Thought question (ungraded):** Stress induces changes in dendritic morphology. Below, the blue neuron is a 'normal' hippocampal neuron, and the red neuron is another neuron from a different animal who did experienced stress. Discuss THREE interventions or drugs that would directly and/or indirectly treat this sort of neuronal symptomology.



Answer key:
For intervention, it could be exercise, ECT, DBS, etc. For Drugs, something to stimulate the release of BDNF would evoke positive structural changes. SSRIs might do the above indirectly. A drug to inhibit the release of cortisol and/or block glucocorticoid receptors in the brain, since they are likely involved in producing this reduced morphology.