1. What does contralateral neglect syndrome suggest about the neuroanatomy of attention? Why does contralateral neglect result from damage to the right, but not left, parietal lobe cortex?

Most contralateral neglect syndrome patients contain parietal cortex lesion, which indicates that parietal area is associated with attention. Right parietal lobe mediates attention to both left and right part of body and extra personal space, whereas left parietal lobe only mediates right part. Therefore, lesion on right parietal lobe is more harmful.

2. What did you learn from the study of the (lateral) parietal cortex?

(1) Patients with parietal lobe lesions usually contain contralateral neglect syndrome. And experiments on monkey shows that some neurons’ activities in parietal area are respond to monkeys’ attention to stimuli. Thus, we can speculate that parietal area involves attention.

(2) Decision signals in lateral intraparietal (LIP) area indicate that parietal area may be relative to decision making.

(3) Parietal area is involved in sensory history mediated bias.

(4) Recent research indicate that parietal area is required for stimulus categorization. (Zhong et al, Nature neuroscience)

3. What lines of evidence support the proposal that declarative memory and procedural memory involve different brain mechanisms? What evidence shows that short-term and long-term memory involve different brain mechanisms?

Patient with brain lesions (such as cerebellum damage) can just be found deficits in declarative memory or procedural memory. Therefore, this phenomenon indicates that the formation of decelerative memory and procedural memory involve different mechanisms.

Like above, some patient loss their abilities to form and store long time memory with short time memory intact. This indicates that short-term and long-term memory involve different brain mechanisms.

4. What cortical region is particularly critical for the delayed response task? What’s persistent activity? List the possible mechanisms that maintain persistent activity.

Prefrontal cortex. Persistent activity, observed in multiple brain area in multiple species, is the activity can be determined during the delay between stimuli and behaviors.

Mechanisms:

Local area network: Circuits in a certain area construct a feedback system to maintain persistent activity.

Distributed network: It involves multiple area in brain to construct circuit which contribute to maintain persistent activity.