

Dental Conference 4

1. What is the difference between serial and parallel processing in sensory systems?
2. A person suffers an injury which severs one side of the spinal cord. What should happen to the sensations of touch and of pain on the body surfaces innervated by sensory axons synapsing at or caudal to the site of spinal cord injury?
3. What is the major difference between the receptive fields of a neuron in the cerebral cortex that responds to touch on the fingertips and one that responds to touch on the back? What is an important functional consequence of this difference?
4. How do the electrical responses of slowly and rapidly adapting somatosensory receptors differ? Which receptor would you predict would be more important in distinguishing between fine- and coarse-grained sandpaper?
5. What is surround inhibition in a receptive field? What purpose does it serve?
6. Would cells in different layers of a column in the primary somatosensory cortex have similar receptive fields? What is the functional significance of the layering?
7. Why is there a delayed component to pain sensation (second pain)?
8. TRP channels form a large family of recently discovered ion channels. What is their significance for pain sensation?
9. There is an interneuron in the dorsal horn of the spinal cord which releases an opioid transmitter onto the synapse between the primary nociceptor and the projection neuron. Does this transmitter act pre- or postsynaptically and does it excite or inhibit that synapse?
10. What is the role of the anterior cingulate cortex in pain perception? From where does it receive input concerning pain?