

# Neuroanatomy Neuroscience Exam 2004

# 3

## Neuroscience Exam #3

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## 4. Chapter: Neuroscience Exam 2004 3

### 1. Neuroscience Exam 2004 3 Questions

#### 4.1.1. The dark current of photoreceptors is so named since it flows in th...

Author: David Corey

The dark current of photoreceptors is so named since it flows in the dark.

It was initially recorded between two extracellular electrodes one placed at the outer segment, and the other placed nearer to the inner segment.

What ionic current is being measured here? (3 points):

a) Ion responsible:

b) Type of channel responsible:

c) Subcellular localization of channel:

- a) Ion responsible: mostly Na<sup>+</sup>
- b) Type of channel responsible: cyclicnucleotide (cGMP) gated
- c) Subcellular localization of channel: outer segment

Check the answer of this question online at QuizOver.com:

Question: [The dark current of photoreceptors is so by Dr. David Corey @MIT](#)

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#### 4.1.2. Following the interaction of rhodopsin with light, which of the fol...

Author: David Corey

Following the interaction of rhodopsin with light, which of the following play a role in stopping the downstream signaling? (3 points)

Please choose only one answer:

- The G-protein coupled receptor transducin is hydrolyzes its GTP and ceases to signal.
- Active rhodopsin eventually hydrolyses its GTP and ceases to signal.
- Active transducin is phosphorylated by opsin kinase and then inactivated by arrestin.
- Active rhodopsin is phosphorylated by opsin kinase and then inactivated by arrestin.
- Active rhodopsin is phosphorylated by opsin kinase and then endocytosed.
- Activation of a phosphodiesterase reduces intracellular cGMP and closes gates of cyclic nucleotide gated channels.

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#### 4.1.3. Sensory adaptation in the retina occurs since (2 points):

Author: David Corey

Sensory adaptation in the retina occurs since (2 points):

Please choose all the answers that apply:

- Calcium influx through cGMP gated channels is reduced during prolonged light exposure. Resting calcium is reduced, which disinhibits guanylyl cyclase and modestly increases cGMP concentration in the photoreceptor.
- The center-surround structure of horizontal cells tends to reduce signals in response to only extremely bright light, always resulting in an intermediate firing pattern in retinal ganglion cells.
- An amacrine cell, which makes a reciprocal connection at the bipolar-retinal ganglion cell synapse, can release GABA or glycine once stimulated by the bipolar neuron. Thus, with a temporal lag, the response of the ganglion cell will be reduced.
- Once exposed to light, rhodopsin is photobleached and needs to be recycled before it can be used again in the photoreceptor. Thus, for seconds afterwards, any particular photoreceptor cells is not available after exposure to light.

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#### 4.1.4. Which of the following are true about the odorant receptor proteins...

Author: David Corey

Which of the following are true about the odorant receptor proteins in primary olfactory sensory neurons? (3 points)

Please choose all the answers that apply:

- They are all seven transmembrane receptors.
- Though encoded by only a few genes, they produce enormous variability in olfactory response through alternative splicing.
- They produce enormous variability in olfactory response since they are encoded by several hundred distinct genes.
- Though encoded by only a few genes, they produce enormous variability in olfactory response through coupling to a large number of different G-proteins.
- They appear to play a role in glomerular targeting of olfactory sensory neurons.
- They appear to play a role in differentiation, ensuring that newborn olfactory sensory neurons express region-appropriate olfactory receptor proteins.

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#### 4.1.5. Which of the following are true about the organization of the olfac...

Author: David Corey

Which of the following are true about the organization of the olfactory epithelium? (3 points)

Please choose all the answers that apply:

- Olfactory sensory neurons (OSNs) provide a graded response to odorants and release transmitter onto olfactory ganglion neurons which project to glomeruli in the olfactory bulb.
- Olfactory sensory neurons expressing a receptor appropriate to an odorant fire action potentials strongly with shorter latency; other OSNs may fire to a lesser degree, or with greater latency, since their receptor may be partially activated by the odorant.
- Olfactory sensory neurons expressing the same olfactory receptor are restricted to certain zones or strips within the olfactory epithelium, but appear to be randomly located within that zone.
- In the adult olfactory system, neural precursor cells differentiate into olfactory sensory neurons, replacing OSNs on a regular basis.
- Sensory neurons expressing a specific type of olfactory receptor target two and only two glomeruli in the olfactory bulb on each side of the brain.

Check the answer of this question online at QuizOver.com:

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#### 4.1.6. Release of glutamate onto the mGluR6 receptor of a bipolar cell wil...

Author: David Corey

Circle the correct response: (2 points)

Release of glutamate onto the mGluR6 receptor of a bipolar cell will cause that cell to fire an action potential.

Please choose only one answer:

- True
- False

Check the answer of this question online at QuizOver.com:

Question: [Release of glutamate onto the mGluR6 receptor Circle correct response](#)

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#### 4.1.7. Parvocellular Ganglion cells have [ Small / Large ] receptive field...

Author: David Corey

Circle the correct response: (2 points)

Parvocellular Ganglion cells have [ Small / Large ] receptive fields and constitute [ More than / Less than ] 50% of the ganglion cells in the retina.

Please choose all the answers that apply:

- Small
- Large
- More than
- Less than

Check the answer of this question online at QuizOver.com:

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#### 4.1.8. In class, we have seen how optical illusions can exploit informatio...

Author: David Corey

In class, we have seen how optical illusions can exploit information processing in our visual system.

In one illusion, a square of a certain luminance surrounded by lighter ones that appears seems darker than an square of the same luminance that is surrounded by darker colored ones.

Which is the BEST explanation for this effect? (2 points)

Please choose only one answer:

- Photoreceptor adaptation to the different light intensities in the surround makes the square surrounded by light ones appear darker.
- Intraretinal processing by horizontal cells establish a spatial center-surround for retinal ganglion cells, thus enhancing edges and making objects surrounded by darker ones appear lighter (and vice versa).
- Intraretinal processing by amacrine cells establish a temporal center-surround for retinal ganglion cells, thus enhancing edges and making objects surrounded by darker ones appear lighter (and vice versa).

Check the answer of this question online at QuizOver.com:

Question: [In class we have seen how optical illusions by Dr. David Corey @MIT](#)

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#### 4.1.9. Which of the following are true with respect to the functional arch...

Author: David Corey

Which of the following are true with respect to the functional architecture of visual cortex? (2 points)

Please choose all the answers that apply:

- Penetrating an ocular dominance column from shallow (pial) to deep, you will encounter cells with a preference first for one eye, then binocular cells, and then cells with a preference for the other eye, all covering the same general spatial receptive field location.
- Per degree of visual space, visual cortex devotes a larger area to processing inputs from near the fovea than the periphery.
- Retinotopy is preserved in all layers (Layer 2/3, Layer 4, etc.) of striate cortex.
- The interaction of retinotopy and orientation selectivity in visual cortex is such that, for a region of visual space (say, the upper left visual field), cells that prefer objects of various orientations in that field are found near one another in cortex.

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#### 4.1.10. Which are true about somatic sensation: (circle all that apply) (3 ...

Author: David Corey

Which are true about somatic sensation: (circle all that apply) (3 points)

Please choose only one answer:

- DRG neurons innervating Pacinian corpuscles and encoding vibration make synapses on dorsal horn neurons of the ascending anterolateral system.
- The receptive fields of dorsal root ganglion cells are shaped by inhibitory feedback from the thalamus
- TRPV1 channels are activated by high temperatures, capsaicin and low pH
- Dorsal root ganglia contain the sensory neurons innervating Meissner corpuscles and Merkel cells, joint and tendon organs, and muscle spindles, but not the nociceptive (C-fiber) neurons with free nerve endings in the skin.
- Skin near whiskers has many more Meissner corpuscles per cm<sup>2</sup> than the skin of the upper arm.

Check the answer of this question online at QuizOver.com:

Question: [Which are true about somatic sensation circle by Dr. David Corey](#)

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#### 4.1.11. Dorsal root ganglia: (circle all true statements; 2 points)

Author: David Corey

Dorsal root ganglia: (circle all true statements; 2 points)

Please choose all the answers that apply:

- Contain the first order neurons of Meissner and Merkel receptors, joint receptors, muscle spindles but not of free nerve ending which are in the dorsal horn.
- Are considered part of the central nervous system
- At the level of the lumbar spinal cord are important for the knee jerk reflex
- Are functionally equivalent to the spiral ganglion (auditory)

Check the answer of this question online at QuizOver.com:

Question: [Dorsal root ganglia circle all true statements by Dr. David Corey](#)

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#### 4.1.12. Ascending sensory pathways share-to some extent-a common architectu...

Author: David Corey

Ascending sensory pathways share-to some extent-a common architecture.

Cells in layer IV of primary sensory cortex receive input from cells in a thalamic nucleus, which in turn receive input from brainstem or spinal cord neurons.

Complete the list below. (5 points)

[table]

stimulus ; sensory cell ; relay neuron ; project to thalamus ; thalamus ; cortex

light touch ; dorsal root ganglion cell; dorsal root ganglion cell; ? ; ? ; postcentral gyrus

sound ; ? ; ? ; cochlear nucleus ; ? ; transverse temporal gyrus

light ; ? ; ? ; ? ; LGN ; ?

[/table]

- [table]  
stimulus ; sensory cell ; relay neuron ; project to thalamus ; thalamus ; cortex  
light touch ; dorsal root ganglion cell; dorsal root ganglion cell; (dorsal column nuclei) ; (VPL) ; postcentral gyrus  
sound ; (hair cell) ; (spiral ganglion cell) ; cochlear nucleus ; (MGN) ; transverse temporal gyrus  
light ; (photoreceptor) ; (bipolar cell) ; (retinal ganglion cell) ; LGN ; (striate cortex)  
[/table]

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#### 4.1.13. If you shock the gamma efferent motor axons innervating a muscle, w...

Author: David Corey

If you shock the gamma efferent motor axons innervating a muscle, what would you record from the muscle's spindle afferents?

If the reflex loop is intact, what would you record from the alpha motor axons innervating the same muscle? Why? (2 points)

- The gamma efferents cause contraction of the muscle spindle, which is the equivalent of stretch. Thus the afferents would increase their firing. These synapse on the alpha motor neurons, which fire to contract the muscle.

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Question: [If you shock the gamma efferent motor axons by Dr. David Corey @MIT](#)

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#### 4.1.14. Which of the following are TRUE about mechanotransduction in hair c...

Author: David Corey

Which of the following are TRUE about mechanotransduction in hair cells? (3 points)

Please choose all the answers that apply:

- The deflection of the hair bundle in any direction leads to a depolarizing receptor potential
- When mechanotransduction channels open in hair cells in vivo there is a passive inward K<sup>+</sup> current.
- Hair cell mechanotransduction channels are relatively fast, opening in tens of milliseconds
- One mechanism for adaptation by hair cells is an adjustment of tip-link tension by myosin motors within the stereocilia.
- Hair cells are fragile, but like olfactory neurons can regenerate in days if killed by trauma or aminoglycoside antibiotics.

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Question: [Which of the following are TRUE about mechanotransduction by Dr.](#)

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#### 4.1.15. A hair cell makes no action potentials but nevertheless communicate...

Author: David Corey

A hair cell makes no action potentials but nevertheless communicates the receptor potential to neurons in the spiral ganglion or vestibular ganglia.

Which of the following regarding this process are true? (3 points)

Please choose all the answers that apply:

- Transmitter is released, not by vesicles, but by a glutamate transporter running in reverse.
- Voltage-gated calcium channels in hair cells open at relatively negative membrane potentials-near the resting potential-to evoke vesicle release.
- The receptor potential is very large, peaking near +10 mV, which can open ordinary calcium channels.
- Hair cells are electrically coupled by gap junctions to postsynaptic fibers.
- Potassium entering through transduction channels in the stereocilia directly stimulates vesicle release.
- Hair cells continuously release vesicles, and small changes in membrane potential modulate the release rate up or down.

Check the answer of this question online at QuizOver.com:

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#### 4.1.16. Detects linear acceleration of the head: \_\_\_\_\_

Author: David Corey

For each of the following, identify which structure performs the function listed. (3 points)

Detects linear acceleration of the head: \_\_\_\_\_

Please choose only one answer:

- cochlear nucleus
- lateral superior olive
- semicircular canals
- inferior colliculus
- utricle
- nucleus of lateral lemniscus
- medial superior olive
- superior vestibular nucleus
- inferior vestibular nucleus

Check the answer of this question online at QuizOver.com:

Question: [Detects linear acceleration of the head For each following identify](#)

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4.1.17. Is the first CNS auditory relay : \_\_\_\_\_

Author: David Corey

For each of the following, identify which structure performs the function listed. (3 points)

Is the first CNS auditory relay : \_\_\_\_\_

Please choose only one answer:

- cochlear nucleus
- lateral superior olive
- semicircular canals
- inferior colliculus
- utricle
- nucleus of lateral lemniscus
- medial superior olive
- superior vestibular nucleus
- inferior vestibular nucleus

Check the answer of this question online at QuizOver.com:

Question: [Is the first CNS auditory relay For each of following identify which](#)

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#### 4.1.18. Processes interaural time differences: \_\_\_\_\_

Author: David Corey

For each of the following, identify which structure performs the function listed. (3 points)

Processes interaural time differences: \_\_\_\_\_

Please choose only one answer:

- cochlear nucleus
- lateral superior olive
- semicircular canals
- inferior colliculus
- utricle
- nucleus of lateral lemniscus
- medial superior olive
- superior vestibular nucleus
- inferior vestibular nucleus

Check the answer of this question online at QuizOver.com:

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4.1.19. Contains cells that might form a spatial auditory map: \_\_\_\_\_

Author: David Corey

For each of the following, identify which structure performs the function listed. (3 points)

Contains cells that might form a spatial auditory map: \_\_\_\_\_

Please choose only one answer:

- cochlear nucleus
- lateral superior olive
- semicircular canals
- inferior colliculus
- utricle
- nucleus of lateral lemniscus
- medial superior olive
- superior vestibular nucleus
- inferior vestibular nucleus

Check the answer of this question online at QuizOver.com:

Question: [Contains cells that might form a spatial For each of the following](#)

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#### 4.1.20. Projects to motor neurons of extraocular muscles \_\_\_\_\_

Author: David Corey

For each of the following, identify which structure performs the function listed. (3 points)

Projects to motor neurons of extraocular muscles \_\_\_\_\_

Please choose only one answer:

- cochlear nucleus
- lateral superior olive
- semicircular canals
- inferior colliculus
- utricle
- nucleus of lateral lemniscus
- medial superior olive
- superior vestibular nucleus
- inferior vestibular nucleus

Check the answer of this question online at QuizOver.com:

Question: [Projects to motor neurons of extraocular For each the following identify](#)

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#### 4.1.21. Briefly describe how frequency and intensity are coded by the audit...

Author: David Corey

Briefly describe how frequency and intensity are coded by the auditory nerve. (2 points)

- Frequency uses a space code (or labeled line code)--different frequencies activate auditory fibers in different places (tonotopy).  
Intensity uses a rate code--an increased stimulus magnitude increases the rate of action potentials.

Check the answer of this question online at QuizOver.com:

Question: [Briefly describe how frequency and intensity by Dr. David Corey](#)

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#### 4.1.22. Contrast the definitions of receptive field for spiral ganglion neu...

Author: David Corey

Contrast the definitions of receptive field for spiral ganglion neurons and retinal ganglion cells. (2 points)

- Spiral ganglion neuron receptive fields are defined by auditory frequency, whereas retinal ganglion cells receptive fields are defined by position in visual space and by color.

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#### 4.1.23. The firing rate of vestibular neurons innervating the semicircular ...

Author: David Corey

The firing rate of vestibular neurons innervating the semicircular canals is largely proportional to angular velocity of the head (rather than angular acceleration) because of (select the one best answer) (2 points):

Please choose only one answer:

- the inhibitory commissural projections that interconnect the vestibular nuclei
- adaptation of hair cell mechanotransduction
- higher density of the otoconia relative to endolymph
- damped mechanics of the canal / cupula

Check the answer of this question online at QuizOver.com:

Question: [The firing rate of vestibular neurons innervating by Dr. David Corey](#)

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#### 4.1.24. In the VOR (for small movements without nystagmus), the motor neuro...

Author: David Corey

In the VOR (for small movements without nystagmus), the motor neurons innervating the extraocular muscles must have firing rates proportional to the angular position of the head.

Yet the vestibular ganglion neurons driving the VOR respond to angular velocity of the head.

How is a velocity signal converted to a position signal for the VOR? (2 points)

Please choose only one answer:

- a collection of neural integrator cells in the nucleus prepositus hypoglossi
- adapataion of the ganglion neurons due to the cupula elasticity
- summation (integration) in superior and medial vestibular nucleus neurons by post-tetanic facilitation
- inhibitory feedback by neurons of the medial superior olive

Check the answer of this question online at QuizOver.com:

Question: [In the VOR for small movements without nystagmus by Dr. David Corey](#)

Flashcards:

<http://www.quizover.com/flashcards/in-the-vor-for-small-movements-without-nystagmus-by-dr-david-corey?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/in-the-vor-for-small-movements-without-nystagmus-by-dr-david-corey?pdf=1505>

#### 4.1.25. List three other properties that differ between fast twitch and slo...

Author: David Corey

List three other properties that differ between fast twitch and slow twitch muscle fibers. (3 points)

[table]

Fast Twitch ;Slow Twitch

1. Activate quickly ;1. Activate slowly

2. ;2.

3. ;3.

4. ;4.

[/table]

- Fast twitch are more anaerobic, have less myoglobin and mitochondria, generate more force, fatigue after continued exertion (any 3 of 4).

Check the answer of this question online at QuizOver.com:

Question: [List three other properties that differ by Dr. David Corey @MIT Introduction](#)

Flashcards:

<http://www.quizover.com/flashcards/list-three-other-properties-that-differ-by-dr-david-corey-mit-introduc?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/list-three-other-properties-that-differ-by-dr-david-corey-mit-introduc?pdf=1505>

4.1.26. A single alpha motor neuron innervates one and only one motor fiber.

Author: David Corey

Which of the following are false? (3 points)

A single alpha motor neuron innervates one and only one motor fiber.

Please choose only one answer:

- True
- False

Check the answer of this question online at QuizOver.com:

Question: [A single alpha motor neuron innervates one Which of the following](#)

Flashcards:

<http://www.quizover.com/flashcards/a-single-alpha-motor-neuron-innervates-one-which-of-the-following?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/a-single-alpha-motor-neuron-innervates-one-which-of-the-following?pdf=1505>

#### 4.1.27. Reflexes are not able to coordinate motor responses on both sides o...

Author: David Corey

Which of the following are false? (3 points)

Reflexes are not able to coordinate motor responses on both sides of the body.

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Reflexes are not able to coordinate motor Which of the following](#)

Flashcards:

<http://www.quizover.com/flashcards/reflexes-are-not-able-to-coordinate-motor-which-of-the-following?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/reflexes-are-not-able-to-coordinate-motor-which-of-the-following?pdf=1505>



#### 4.1.28. The motor unit type (fast/slow twitch) is determined by its innerva...

Author: David Corey

Which of the following are false? (3 points)

The motor unit type (fast/slow twitch) is determined by its innervating motor neuron.

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [The motor unit type fast/slow twitch is Which of following are false](#)

Flashcards:

<http://www.quizover.com/flashcards/the-motor-unit-type-fast-slow-twitch-is-which-of-following-are-false?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/the-motor-unit-type-fast-slow-twitch-is-which-of-following-are-false?pdf=1505>

#### 4.1.29. There are more muscle fibers per motor unit in the large muscles of...

Author: David Corey

Which of the following are false? (3 points)

There are more muscle fibers per motor unit in the large muscles of the thigh than the intrinsic muscles controlling the fingers.

Please choose only one answer:

- True
- False

Check the answer of this question online at QuizOver.com:

Question: [There are more muscle fibers per motor unit Which of the following](#)

Flashcards:

<http://www.quizover.com/flashcards/there-are-more-muscle-fibers-per-motor-unit-which-of-the-following?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/there-are-more-muscle-fibers-per-motor-unit-which-of-the-following?pdf=1505>

#### 4.1.30. Fiber type grouping in the muscle suggests that the individual is s...

Author: David Corey

Which of the following are false? (3 points)

Fiber type grouping in the muscle suggests that the individual is suffering from primary damage to the muscle.

Please choose only one answer:

- True
- False

Check the answer of this question online at QuizOver.com:

Question: [Fiber type grouping in the muscle suggests Which of following are](#)

Flashcards:

<http://www.quizover.com/flashcards/fiber-type-grouping-in-the-muscle-suggests-which-of-following-are?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/fiber-type-grouping-in-the-muscle-suggests-which-of-following-are?pdf=1505>

4.1.31. \_\_\_\_ A patient has difficulty performing simple balance tasks, and c...

Author: David Corey

\_\_\_\_ A patient has difficulty performing simple balance tasks, and cannot read while turning his head back and forth.

Please choose only one answer:

- M1 lesion
- Cerebellar lesion: left cerebellar cortex/hemisphere
- Left corticospinal tract lesion, red nucleus spared
- Right corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: right cerebellar cortex/hemisphere
- Right corticospinal tract lesion, red nucleus spared
- PM or SMA lesion
- Left Corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: flocculonodular node.

Check the answer of this question online at QuizOver.com:

Question: [A patient has difficulty performing simple by Dr. David Corey @MIT](#)

Flashcards:

<http://www.quizover.com/flashcards/a-patient-has-difficulty-performing-simple-by-dr-david-corey-mit?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/a-patient-has-difficulty-performing-simple-by-dr-david-corey-mit?pdf=1505>

4.1.32. \_\_\_\_ A patient's posture is affected such that upon noxious stimulat...

Author: David Corey

\_\_\_\_ A patient's posture is affected such that upon noxious stimulation, he brings his left arm and leg towards his body and rotates them backward.

Please choose only one answer:

- M1 lesion
- Cerebellar lesion: left cerebellar cortex/hemisphere
- Left corticospinal tract lesion, red nucleus spared
- Right corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: right cerebellar cortex/hemisphere
- Right corticospinal tract lesion, red nucleus spared
- PM or SMA lesion
- Left Corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: flocculonodular node.

Check the answer of this question online at QuizOver.com:

Question: [A patient s posture is affected such that by Dr. David Corey @MIT](#)

Flashcards:

<http://www.quizover.com/flashcards/a-patient-s-posture-is-affected-such-that-by-dr-david-corey-mit?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/a-patient-s-posture-is-affected-such-that-by-dr-david-corey-mit?pdf=1505>

4.1.33. \_\_\_\_ A patient finds she has ataxic movements in her right arm and h...

Author: David Corey

\_\_\_\_ A patient finds she has ataxic movements in her right arm and hand while dribbling a basketball, but can use her left arm and hand without any difficulty.

Please choose only one answer:

- M1 lesion
- Cerebellar lesion: left cerebellar cortex/hemisphere
- Left corticospinal tract lesion, red nucleus spared
- Right corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: right cerebellar cortex/hemisphere
- Right corticospinal tract lesion, red nucleus spared
- PM or SMA lesion
- Left Corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: flocculonodular node.

Check the answer of this question online at QuizOver.com:

Question: [A patient finds she has ataxic movements by Dr. David Corey @MIT](#)

Flashcards:

<http://www.quizover.com/flashcards/a-patient-finds-she-has-ataxic-movements-by-dr-david-corey-mit?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/a-patient-finds-she-has-ataxic-movements-by-dr-david-corey-mit?pdf=1505>

4.1.34. \_\_\_\_ A patient can bend her arm about the elbow and wrist, but has t...

Author: David Corey

\_\_\_\_ A patient can bend her arm about the elbow and wrist, but has trouble completing a task in which using the 2 joints in combination is necessary (such as retrieving a piece of candy behind a transparent barrier).

Please choose only one answer:

- M1 lesion
- Cerebellar lesion: left cerebellar cortex/hemisphere
- Left corticospinal tract lesion, red nucleus spared
- Right corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: right cerebellar cortex/hemisphere
- Right corticospinal tract lesion, red nucleus spared
- PM or SMA lesion
- Left Corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: flocculonodular node.

Check the answer of this question online at QuizOver.com:

Question: [A patient can bend her arm about the elbow by Dr. David Corey @MIT](#)

Flashcards:

<http://www.quizover.com/flashcards/a-patient-can-bend-her-arm-about-the-elbow-by-dr-david-corey-mit?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/a-patient-can-bend-her-arm-about-the-elbow-by-dr-david-corey-mit?pdf=1505>

4.1.35. \_\_\_\_ Following a period of weakness lasting several days, a patient ...

Author: David Corey

\_\_\_\_ Following a period of weakness lasting several days, a patient develops a persistent flexion of the right arm, while the right leg remains extended.

Please choose only one answer:

- M1 lesion
- Cerebellar lesion: left cerebellar cortex/hemisphere
- Left corticospinal tract lesion, red nucleus spared
- Right corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: right cerebellar cortex/hemisphere
- Right corticospinal tract lesion, red nucleus spared
- PM or SMA lesion
- Left Corticospinal tract and red nucleus lesion, medial brainstem system spared
- Cerebellar lesion: flocculonodular node.

Check the answer of this question online at QuizOver.com:

Question: [Following a period of weakness lasting several by Dr. David Corey](#)

Flashcards:

<http://www.quizover.com/flashcards/following-a-period-of-weakness-lasting-several-by-dr-david-corey?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/following-a-period-of-weakness-lasting-several-by-dr-david-corey?pdf=1505>



4.1.36. Indicate all the following that are true about motor control (3 poi...

Author: David Corey

Indicate all the following that are true about motor control (3 points):

Please choose all the answers that apply:

- Most corticospinal axons synapse on alpha motoneurons.
- Motor cortex, unlike sensory cortex, varies in its properties along the radial axis (perpendicular to the cortical).
- Neurons sensitive to the direction of limb movements can be found in both M1 and PMA.
- An M1 neuron encoding the kinematics of an arm movement would be expected to fire at a similar rate for the same changes in joint angles, regardless of the force required to make the movement.
- The direction-tuning of M1 neurons tends to be rather narrow, implying that only a few specific neurons may be required to complete precise movements.
- As you go from premotor to motor areas of the cortex, there is a trend toward less anticipatory "set" neural activity.

Check the answer of this question online at QuizOver.com:

Question: [Indicate all the following that are true by Dr. David Corey @MIT](#)

Flashcards:

<http://www.quizover.com/flashcards/indicate-all-the-following-that-are-true-by-dr-david-corey-mit?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/indicate-all-the-following-that-are-true-by-dr-david-corey-mit?pdf=1505>

4.1.37. \_\_\_ Fibers bifurcate in the molecular layer and run in opposite dir...

Author: David Corey

Climbing fibers and Mossy fibers are the main input to the cerebellum. For each of the following, indicate whether the statement is true for climbing fibers (C), mossy fibers (M), both (B), or neither (N). (3 points)

\_\_\_ Fibers bifurcate in the molecular layer and run in opposite directions, parallel to the long axis of the lobules.

Please choose only one answer:

- climbing fibers (C),
- mossy fibers (M),
- both (B), or
- neither (N)

Check the answer of this question online at QuizOver.com:

Question: [Fibers bifurcate in the molecular layer Climbing and Mossy are main](#)

Flashcards:

<http://www.quizover.com/flashcards/fibers-bifurcate-in-the-molecular-layer-climbing-and-mossy-are-main?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/fibers-bifurcate-in-the-molecular-layer-climbing-and-mossy-are-main?pdf=1505>

#### 4.1.38. \_\_\_\_ Form excitatory synapses

Author: David Corey

Climbing fibers and Mossy fibers are the main input to the cerebellum. For each of the following, indicate whether the statement is true for climbing fibers (C), mossy fibers (M), both (B), or neither (N). (3 points)

\_\_\_\_ Form excitatory synapses

Please choose only one answer:

- climbing fibers (C),
- mossy fibers (M),
- both (B), or
- neither (N)

Check the answer of this question online at QuizOver.com:

Question: [Form excitatory synapses Climbing fibers and Mossy fibers are the](#)

Flashcards:

<http://www.quizover.com/flashcards/form-excitatory-synapses-climbing-fibers-and-mossy-fibers-are-the?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/form-excitatory-synapses-climbing-fibers-and-mossy-fibers-are-the?pdf=1505>

#### 4.1.39. \_\_\_ Excitation leads to complex spikes in Purkinje neurons

Author: David Corey

Climbing fibers and Mossy fibers are the main input to the cerebellum. For each of the following, indicate whether the statement is true for climbing fibers (C), mossy fibers (M), both (B), or neither (N). (3 points)

\_\_\_ Excitation leads to complex spikes in Purkinje neurons

Please choose only one answer:

- climbing fibers (C),
- mossy fibers (M),
- both (B), or
- neither (N)

Check the answer of this question online at QuizOver.com:

Question: [Excitation leads to complex spikes in Purkinje Climbing fibers and](#)

Flashcards:

<http://www.quizover.com/flashcards/excitation-leads-to-complex-spikes-in-purkinje-climbing-fibers-and?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/excitation-leads-to-complex-spikes-in-purkinje-climbing-fibers-and?pdf=1505>

4.1.40. \_\_\_\_ Arise in the inferior olivary nucleus

Author: David Corey

Climbing fibers and Mossy fibers are the main input to the cerebellum. For each of the following, indicate whether the statement is true for climbing fibers (C), mossy fibers (M), both (B), or neither (N). (3 points)

\_\_\_\_ Arise in the inferior olivary nucleus

Please choose only one answer:

- climbing fibers (C),
- mossy fibers (M),
- both (B), or
- neither (N)

Check the answer of this question online at QuizOver.com:

Question: [Arise in the inferior olivary nucleus Climbing fibers and Mossy fibers](#)

Flashcards:

<http://www.quizover.com/flashcards/arise-in-the-inferior-olivary-nucleus-climbing-fibers-and-mossy-fibers?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/arise-in-the-inferior-olivary-nucleus-climbing-fibers-and-mossy-fibers?pdf=1505>

#### 4.1.41. \_\_\_\_ Synapse on Purkinje neurons

Author: David Corey

Climbing fibers and Mossy fibers are the main input to the cerebellum. For each of the following, indicate whether the statement is true for climbing fibers (C), mossy fibers (M), both (B), or neither (N). (3 points)

\_\_\_\_ Synapse on Purkinje neurons

Please choose only one answer:

- climbing fibers (C),
- mossy fibers (M),
- both (B), or
- neither (N)

Check the answer of this question online at QuizOver.com:

Question: [Synapse on Purkinje neurons Climbing fibers and Mossy fibers are](#)

Flashcards:

<http://www.quizover.com/flashcards/synapse-on-purkinje-neurons-climbing-fibers-and-mossy-fibers-are?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/synapse-on-purkinje-neurons-climbing-fibers-and-mossy-fibers-are?pdf=1505>

#### 4.1.42. \_\_\_\_ Form inhibitory synapses

Author: David Corey

Climbing fibers and Mossy fibers are the main input to the cerebellum. For each of the following, indicate whether the statement is true for climbing fibers (C), mossy fibers (M), both (B), or neither (N). (3 points)

\_\_\_\_ Form inhibitory synapses

Please choose only one answer:

- climbing fibers (C),
- mossy fibers (M),
- both (B), or
- neither (N)

Check the answer of this question online at QuizOver.com:

Question: [Form inhibitory synapses Climbing fibers and Mossy fibers are the](#)

Flashcards:

<http://www.quizover.com/flashcards/form-inhibitory-synapses-climbing-fibers-and-mossy-fibers-are-the?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/form-inhibitory-synapses-climbing-fibers-and-mossy-fibers-are-the?pdf=1505>

#### 4.1.43. Draw the direct and (separate drawing) indirect pathways from corte...

Author: David Corey

Draw the direct and (separate drawing) indirect pathways from cortex through striatum and back again, indicating the nuclei involved, the neurotransmitters used by the projection neurons from each nuclei, and the net effect on voluntary movement. (6 points)

Check the answer of this question online at QuizOver.com:

Question: [Draw the direct and separate drawing indirect by Dr. David Corey](#)

Flashcards:

<http://www.quizover.com/flashcards/draw-the-direct-and-separate-drawing-indirect-by-dr-david-corey?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/draw-the-direct-and-separate-drawing-indirect-by-dr-david-corey?pdf=1505>



#### 4.1.44. Which of the following are true: (2 points)

Author: David Corey

Which of the following are true: (2 points)

Please choose all the answers that apply:

- Since projection neurons in the striatum are GABAergic, inhibitory interneurons are not present in the caudate and putamen.
- Medium spiny neurons of the putamen project to both external and internal subdivisions of the globus pallidus.
- Both pharmacological subtypes (D1 and D2) of dopamine receptors are present on medium spiny neurons of the putamen involved in the direct pathway promoting motor movement.
- Both pharmacological subtypes (D1 and D2) of dopamine receptors are present on medium spiny neurons of the globus pallidus involved in the direct pathway promoting motor movement.

Check the answer of this question online at QuizOver.com:

Question: [Which of the following are true 2 points by Dr. David Corey @MIT](#)

Flashcards:

<http://www.quizover.com/flashcards/which-of-the-following-are-true-2-points-by-dr-david-corey-mit?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/which-of-the-following-are-true-2-points-by-dr-david-corey-mit?pdf=1505>

#### 4.1.45. Identify the gene (1):

Author: David Corey

Amyotrophic Lateral Sclerosis:

Although only some cases of Amyotrophic Lateral Sclerosis seem to be inherited, one important recent discovery has identified a gene that plays a role in ALS.

This conclusion is supported by experiments using transgenic animals with similar deficits in the gene. (4 points)

Identify the gene (1):

- Superoxide Dismutase;

Check the answer of this question online at QuizOver.com:

Question: [Identify the gene 1 Amyotrophic Lateral Sclerosis Although only by](#)

Flashcards:

<http://www.quizover.com/flashcards/identify-the-gene-1-amyotrophic-lateral-sclerosis-although-only-by?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/identify-the-gene-1-amyotrophic-lateral-sclerosis-although-only-by?pdf=1505>

4.1.46. Is it sex-linked or autosomal (0.5):

Author: David Corey

Amyotrophic Lateral Sclerosis:

Although only some cases of Amyotrophic Lateral Sclerosis seem to be inherited, one important recent discovery has identified a gene that plays a role in ALS.

This conclusion is supported by experiments using transgenic animals with similar deficits in the gene. (4 points)

Is it sex-linked or autosomal (0.5):

- Autosomal

Check the answer of this question online at QuizOver.com:

Question: [Is it sex-linked or autosomal 0.5 Amyotrophic Lateral Sclerosis Although](#)

Flashcards:

<http://www.quizover.com/flashcards/is-it-sex-linked-or-autosomal-0-5-amyotrophic-lateral-sclerosis-althou?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/is-it-sex-linked-or-autosomal-0-5-amyotrophic-lateral-sclerosis-althou?pdf=1505>

#### 4.1.47. Cell type(s) in which gene is expressed (0.5):

Author: David Corey

Amyotrophic Lateral Sclerosis:

Although only some cases of Amyotrophic Lateral Sclerosis seem to be inherited, one important recent discovery has identified a gene that plays a role in ALS.

This conclusion is supported by experiments using transgenic animals with similar deficits in the gene. (4 points)

Cell type(s) in which gene is expressed (0.5):

- All cells;

Check the answer of this question online at QuizOver.com:

Question: [Cell type s in which gene is expressed Amyotrophic Lateral Sclerosis](#)

Flashcards:

<http://www.quizover.com/flashcards/cell-type-s-in-which-gene-is-expressed-amyotrophic-lateral-sclerosis?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/cell-type-s-in-which-gene-is-expressed-amyotrophic-lateral-sclerosis?pdf=1505>

#### 4.1.48. Type of mutation that accounts for most cases (0.5): (null, nonsens...

Author: David Corey

Amyotrophic Lateral Sclerosis:

Although only some cases of Amyotrophic Lateral Sclerosis seem to be inherited, one important recent discovery has identified a gene that plays a role in ALS.

This conclusion is supported by experiments using transgenic animals with similar deficits in the gene. (4 points)

Type of mutation that accounts for most cases (0.5): (null, nonsense, missense)

- Missense

Check the answer of this question online at QuizOver.com:

Question: [Type of mutation that accounts for most Amyotrophic Lateral Sclerosis](#)

Flashcards:

<http://www.quizover.com/flashcards/type-of-mutation-that-accounts-for-most-amyotrophic-lateral-sclerosis?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/type-of-mutation-that-accounts-for-most-amyotrophic-lateral-sclerosis?pdf=1505>

#### 4.1.49. Normal cellular function of the gene (short answer) (1.5):

Author: David Corey

Amyotrophic Lateral Sclerosis:

Although only some cases of Amyotrophic Lateral Sclerosis seem to be inherited, one important recent discovery has identified a gene that plays a role in ALS.

This conclusion is supported by experiments using transgenic animals with similar deficits in the gene. (4 points)

Normal cellular function of the gene (short answer) (1.5):

- Help cells eliminate/reduce damage from intracellular free radicals by catalyzing superoxide anion to hydrogen peroxide.  
Thus, oxidative cell damage and apoptosis is reduced.

Check the answer of this question online at QuizOver.com:

Question: [Normal cellular function of the gene short Amyotrophic Lateral Sclerosis](#)

Flashcards:

<http://www.quizover.com/flashcards/normal-cellular-function-of-the-gene-short-amyotrophic-lateral-scleros?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/normal-cellular-function-of-the-gene-short-amyotrophic-lateral-scleros?pdf=1505>

## 4.1.50. Muscle fatigue

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Muscle fatigue

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Muscle fatigue Indicate which of the following are cardinal by Dr](#)

Flashcards:

<http://www.quizover.com/flashcards/muscle-fatigue-indicate-which-of-the-following-are-cardinal-by-dr?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/muscle-fatigue-indicate-which-of-the-following-are-cardinal-by-dr?pdf=1505>

## 4.1.51. Rigidity

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Rigidity

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Rigidity Indicate which of the following are cardinal by Dr. David](#)

Flashcards:

<http://www.quizover.com/flashcards/rigidity-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/rigidity-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>



## 4.1.52. Dementia

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Dementia

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Dementia Indicate which of the following are cardinal by Dr. David](#)

Flashcards:

<http://www.quizover.com/flashcards/dementia-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/dementia-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

## 4.1.53. Akinesia

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Akinesia

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Akinesia Indicate which of the following are cardinal by Dr. David](#)

Flashcards:

<http://www.quizover.com/flashcards/akinesia-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/akinesia-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

## 4.1.54. Hemifacial spasms

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Hemifacial spasms

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Hemifacial spasms Indicate which of the following are cardinal by](#)

Flashcards:

<http://www.quizover.com/flashcards/hemifacial-spasms-indicate-which-of-the-following-are-cardinal-by?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/hemifacial-spasms-indicate-which-of-the-following-are-cardinal-by?pdf=1505>

## 4.1.55. Tremor

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Tremor

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Tremor Indicate which of the following are cardinal by Dr. David](#)

Flashcards:

<http://www.quizover.com/flashcards/tremor-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/tremor-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

## 4.1.56. Gait disorder

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Gait disorder

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Gait disorder Indicate which of the following are cardinal by Dr](http://www.quizover.com/question/gait-disorder-indicate-which-of-the-following-are-cardinal-by-dr?pdf=1505)

Flashcards:

<http://www.quizover.com/flashcards/gait-disorder-indicate-which-of-the-following-are-cardinal-by-dr?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/gait-disorder-indicate-which-of-the-following-are-cardinal-by-dr?pdf=1505>

## 4.1.57. Nystagmus

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Nystagmus

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Nystagmus Indicate which of the following are cardinal by Dr. David](#)

Flashcards:

<http://www.quizover.com/flashcards/nystagmus-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/nystagmus-indicate-which-of-the-following-are-cardinal-by-dr-david?pdf=1505>

## 4.1.58. Bradykinesia

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Bradykinesia

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Bradykinesia Indicate which of the following are cardinal by Dr.](#)

Flashcards:

<http://www.quizover.com/flashcards/bradykinesia-indicate-which-of-the-following-are-cardinal-by-dr?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/bradykinesia-indicate-which-of-the-following-are-cardinal-by-dr?pdf=1505>

#### 4.1.59. Loss of coordination and balance

Author: David Corey

Indicate which of the following are cardinal symptoms of Parkinsonism (5 points):

Loss of coordination and balance

Please choose only one answer:

- True
- False

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Loss of coordination and balance Indicate which the following are](#)

Flashcards:

<http://www.quizover.com/flashcards/loss-of-coordination-and-balance-indicate-which-the-following-are?pdf=1505>

Interactive Question:

<http://www.quizover.com/question/loss-of-coordination-and-balance-indicate-which-the-following-are?pdf=1505>