



AP Bio

FRQ Fridays

2014 #6
Reflex Arcs

Hi!

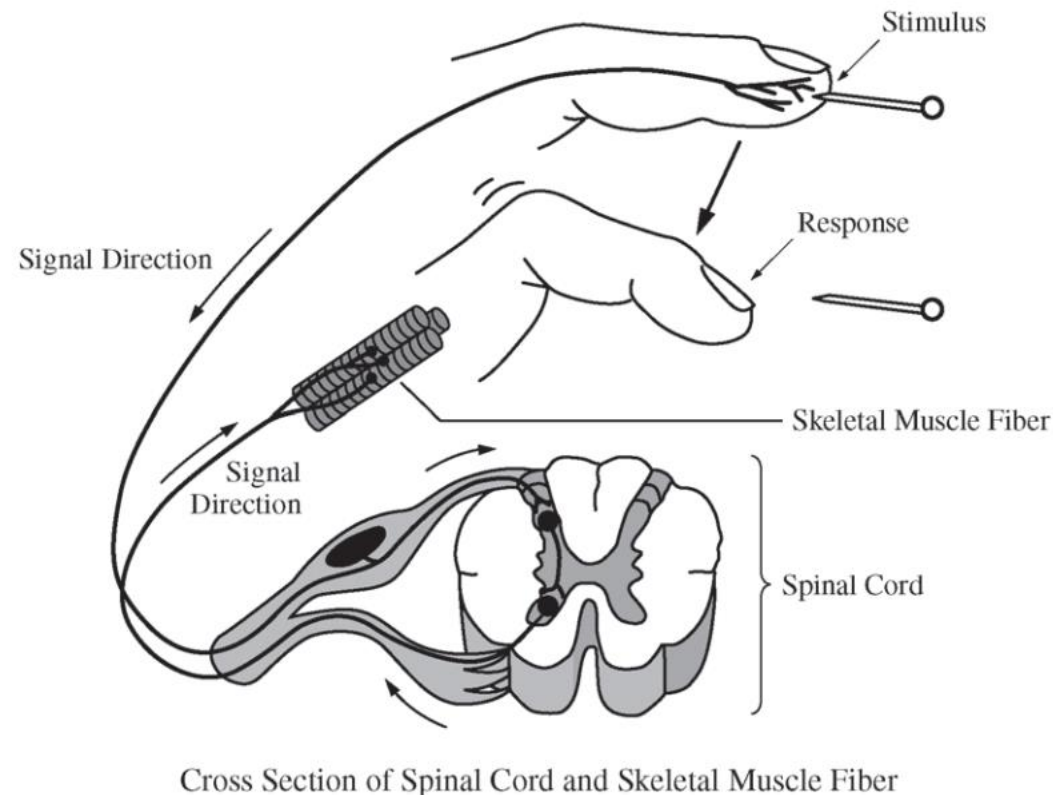
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Information processing involves complex neural pathways that require a certain amount of time between recognition of a stimulus and the resulting response. For some types of stimuli, a reflex arc replaces the typical stimulus-response pathway. A representation of a reflex arc is shown in the figure above.

Based on the figure, **describe** TWO ways that the reflex arc differs from typical stimulus-response transmission pathways. **Provide** reasoning to support the claim that reflex arcs help organisms avoid serious injury.

Nervous System is out of scope of the CED, but can be used for as an illustrative example with information provided



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Based on the figure, **describe** TWO ways that the reflex arc differs from typical stimulus-response transmission pathways. **Provide** reasoning to support the claim that reflex arcs help organisms avoid serious injury.

Description of difference (**1 point each; 2 points maximum**)

- Quicker response time
- No integration with brain / does not reach brain before response occurs
- Fewer neurons / synapses involved in reflex arc / shorter distance for signal to travel
- Involuntary / no conscious control / no processing by brain

Reasoning to support claim (**1 point maximum**)

- Quicker response to a threat
- Response is innate (automatic response) rather than learned / predetermined neuron pathway / hardwired



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Reflex arcs do not require as much time between recognition of a stimulus and the resulting ~~response~~ response. Reflex arcs also only require signals to travel to the spinal cord and not all the way to the brain like in a typical stimulus-response transmission. Reflex arcs help organisms avoid serious injury because it takes less time for them to react to the danger, and the faster reflex could prevent them from cutting



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of burning themselves. It takes less time to alert their body that they are in pain, so they are quicker to react so they are no longer feeling that pain.

