***Dr. Ammar Yaseen Mansour***

***The Spinal Reflex: The Traditional Physiology***

[video*To watch a brief video explaining the classic physiology of the spinal reflex,  
click this link:*](https://youtu.be/FVKRX3FR1mE)

***Conventionally****, each spinal reflex is said to possess:*

* *An****afferent sensory pathway***
* *An****efferent motor pathway***

*Typically, the first pathway terminates where the second begins—within the****same spinal segment****. Occasionally, both pathways interface across****adjacent spinal segments****(rostral or caudal).*

* ***Sensory Afferent Pathway****:*

*Converges at****sensory neurons****within the****spinal ganglion****of the posterior root (dorsal root) of the spinal nerve.*

* ***Motor Efferent Pathway****:*

*Originates from****motor neurons****in the****anterior horn****of the spinal cord.*

*So far, I agree with traditional physiology regarding the occurrence of the spinal reflex. Beyond this, my perspectives diverge irrevocably.*

***The Traditional Model Asserts****:*

*Interposed between sensory neurons (SN) and lower motor neurons are****intermediate neurons (interneurons)****. These interneurons relay the****afferent impulse****directly from sensory to motor neurons, thereby completing a functional circuit:*

* *The****Lower Motor Neuron (LMN) Circuit***
* *Equivalently, the****Spinal Reflex Circuit***

*Thus, according to this model (see Figure below), the spinal reflex comprises:*

* *The****sensory neuron (SN)***
* *The****lower motor neuron (LMN)****(within the same or adjacent segment)*
* ***Interneurons****bridging them...or so they claim.*

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| ***The Spinal Reflex (Traditional Conception)***  [video](https://youtu.be/FVKRX3FR1mE)[*To watch a brief video explaining the classic physiology of the spinal reflex, click this link:*](https://youtu.be/FVKRX3FR1mE)  ***The spinal reflex circuit comprises three elements:***   1. *Sensory Neuron (SN)* 2. *Interneuron (Intermediate Neuron)* 3. *Lower Motor Neuron (LMN)*   ***Neuroanatomical Localization:***   | ***Component*** | ***Location*** | | --- | --- | | ***Sensory Neuron (SN)*** | *Spinal ganglion of the dorsal root* | | ***Interneuron*** | *Posterior horn of the spinal cord* | | ***Lower Motor Neuron (LMN)*** | *Anterior horn of the spinal cord* |   *All neural elements reside within****one or two adjacent spinal segments****.*  ***Physiological Sequence (Traditional View):***   1. ***Sensory input****arrives at the sensory neuron (SN).* 2. *Excitation is relayed via an****interneuron****to the lower motor neuron (LMN).* 3. *The sensory input carries a****binding motor command****that mandates execution.* 4. *LMNs promptly issue motor orders to effector targets.*   ***Role of the Upper Motor Neuron (UMN):***  *The UMN remains****detached from the decision site****. It merely:*   * *Monitors reflex activity* * *Evaluates reflex performance...without direct engagement in the reflex execution.* |

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*In other contexts, you can also read the following articles:*

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