

Vagus can make you Happy!!

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'The great wandering protector' Vagus nerve

The longest among the cranial nerves is the tenth cranial nerve called the vagus nerve (VN). It contains motor and sensory fibers and passes through the neck and thorax to the abdomen. Apart from its main functions which includes the control of the respiratory system, cardiovascular system, endocrine immune systems of the body. It also regulates gastro intestinal physiology. It has a major role in the regulation of appetite and obesity and encompasses a multifaceted interaction between peripheral and central mechanisms relating efferent and afferent Vagal Nerve fibers. Inflammation in the periphery is sensed by afferent nerve fibers of vagal Nerve which is then integrated in the parts of brainstem. This process affects the mood, sickness behaviour, appetite. Thus the vagus nerve is called the "great wandering protector" as it has a vital role in the homeostasis.

The mystery behind Gut Brain Axis

Conventionally, researchers alleged that the vagus nerve solely facilitated various functions such as nausea and satiety. Whereas reward signals from the gut to the brain is transmitted by the hormones in blood circulation. The old-style interpretation is that the vagus nerve is not related to pleasure and motivation. Earlier research recognized the gut as a chief controller of emotional and motivational states. But then, the germane neuronal circuitry concerned with the gut-brain axis concerned with reward and motivation continued to be elusive.

Optogenetics & Vagal neurons

Study by Ivan de Araujo *et al*, Senior Faculty in the Department of Neuroscience at the Icahn School of Medicine at Mount Sinai used a state-of-the-art procedure called the "optogenetics," which united several viruses that transports molecular tools in a way that permitted them to activate vagal neurons in the gut optically while vagal neurons to other organs remained unaffected.

Vagus nerve & Reward neurons

Ivan de Araujo *et al* found that, dispersed amongst the sensory cells of the vagus nerve (right branch), there exists a neuronal population of 'reward neurons'. They also discovered that the stimulation of the vagus nerve, precisely its upper gut branch, is adequate to powerfully excite reward neurons which is located deep in the brain. They also discovered that these reward neurons of the right vagus nerve functions similar to that of the reward neurons in the central nervous system. This shows that the vagal neurons forms the association between the peripheral neurons to the formerly charted groups of reward neurons in the central nervous system. Interestingly, they also found that unlike the right vagal neurons, the left vagal neurons were not connected with reward function but linked with satiety.

Say No to Vagotomy

While a few decades ago, vagotomy was signified as a well-established surgical management for peptic ulcer and in maintenance of homeostasis of a variety of organ systems. But it is now recognised

that vagus nerve is actually precious as it regulates the satiety, appetite, mood and reward functions. Clinical research are progressing in such a way that they will shortly reveal that the vagus nerve should be preserved with great care rather than being dissected as in vagotomy. Undeniably, the vagus nerve still skins many unrevealed anonymities which will be germane for better knowledge and understanding of physiology behind the gut brain axis and pathophysiology of various gut disorders.

References

1. Browning KN, Verheijden S, Boeckxstaens GE. (2016). The Vagus Nerve in Appetite Regulation, Mood, and Intestinal Inflammation. *Gastroenterology* 152(4): 730-744.
2. Wenfei Han, Luis A. Tellez, Matthew H. Perkins, Isaac O. Perez, Taoran Qu, Jozelia Ferreira, et al. (2018). A Neural Circuit for Gut-Induced Reward. *Cell* 175(3): 665-678.e23.

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