

News and Views

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NEWS

Global Control of Blood Flow by Brain Cells

It is known that brain has tremendous control over heart and blood vessels which is essential for our survival. This may be a simple mundane task of change in posture, but it actually involves a huge shift in blood flow. If this is not balanced can even risk our life. However, it was unknown how exactly brain achieves this function effortlessly. Recently, a group of researchers from Florey Institute of Neuroscience and Mental health and Macquarie University have reported discovery of a group of brain cells called RVLM neurons which act as the master controller for cardiovascular system. The research explores how blood flows to different parts of body under the central control of brain. These cells can simultaneously exert influence on multiple targets of body which includes heart, blood vessels of limbs etc. These neurons also target sympathetic nerves meant for functionally similar tissues. Thus, they are involved in a coordinated activity across the cardiovascular system as a single unit as part of global control of blood flow. For this experiment they used genetically modified canine adenovirus in rat model. Then they successfully made the blood flow regulating brain cells glow which was visualized under microscope. This method for the first time enabled them to trace the cells' connections to multiple parts of cardiovascular system. Among the group of cells, they further identified a critical type of cells which was evolutionarily the most conserved part of medulla oblongata. These preserved cells are in charge of sending connections to multiple cardiovascular targets. By using a technique of 'optogenetics', they further made these cells sensitive to laser light (473nm × 20 ms pulses at 10 mW) and therefore, could control the cellular activity. With this technique they could activate sympathetic premotor neurons projecting to lumbar spinal rostral spinal segments proving global changes in sympathetic activity. This is an important discovery since the master controllers can explain the mechanisms involved in hypertension and heart failure with regulatory point in brain.

VIEWS

Puppy Eye

Have you ever imagined if your dog is using its puppy eye to actually win you over?

Faces capture our attention. If one dog turns his head away from another dog it actually avoiding his eye contact probably to avoid confrontation. Dogs are more skillful in using human communication cues. Dogs are even able to track human eye movement which helps them to perceive our intention. However, is there a logic behind it? Various scientific experiments done on human volunteers have already supported this notion. But, it's interesting to note that even animals applied this fact and used for capturing our attention. The most trusted animal for human beings is dogs. Is there a science behind the connection between man and dog? Yes, now science supports this with new discoveries. It is now discovered that during evolution dogs actually evolved newer muscles around eyes so that their level of communication with human beings increased. Domestication of wolves into dogs led to change in not only their behaviors but also anatomy. Especially the *Levator anguli oculi medialis* muscle was responsible for raising the inner eyebrow in dogs which was not there in wolves. Perhaps those dogs who used these muscles more were able to capture the attention of our forefathers and were domesticated compared to others. This could have been the origin of phrase: 'puppy eye'; it has also been suggested that mutual gaze between dog and human may trigger a rise in oxytocin in both. Oxytocin has a fundamental role in affiliative behaviors in mammals. As this cross-species oxytocin loop is restricted only between dogs and humans and not even shared by related animals such as wolves, the evolutionary anatomical changes in *Levator anguli oculi medialis* muscle might have played a major role in selective domestication of dogs compared to other species.

So next time your dog gives you the puppy eye you must give your full attention.

REFERENCE

1. Farmer DGS, Pracejus N, Dempsey B, Turner A, Bokinić P, Paton JFER, *et al.* On the presence and functional significance of sympathetic premotor neurons with collateralised spinal axons in the rat. *J Physiol.* 2019. doi: 10.1113/JP277661