

ABSTRACT - Scientific Student Conference

The predictive model of brainfunctioning claims that besides having the representative function of the sensory system, the comparison of the inner model, created by the brain, and the external model is essential too. The dopamine containing neurons in the midbrain are responsible for producing this comparison signal in that context. In the case of our experiments it is important that the dopamine system activates when a rewarding event happens. When the input effects such as the properties of the reward from the perceived environment result in a different model from the inner one, the system activates immediately. This external sign or input can be a new, unexpected event or a miss of an expected event, that got used to coming in the situation but it did not arrive. When the inner representation model differs from the perceived environment, an error signal, the reward prediction error occurs. However we do not have data and exact information about how that manifests in the cortex. During our experiments we examined the appearance of the prediction reward error in the cortical region by a two-photon microscope, using Ca^{2+} -indicators and optimized behavioral protocols designed for our research task in mice. Our results show that the prediction error signal occurs in the activity pattern of vasoactive intestinal polypeptide (VIP) expressing interneurons, which cells have effects on other types of neurons that are connected with them in the disinhibitional circuit. VIP cells might be responsible for the development of the associative memory, which helps the individual to adapt to the environment by recognizing situations that demand special attention.