

INMED Conference Room

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And

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A descending dopamine pathway controlling locomotion

The muscle activations finely sequenced during locomotion are generated by spinal cord interneurons, collectively known as "Central Pattern Generators" (CPG). The spinal CPGs are in turn controlled by supraspinal structures that start, maintain, and stop locomotion. This conference will deal with some of the neural organisation involved in the supraspinal control of locomotion. One brainstem area that plays a crucial role is the Mesencephalic Locomotor Region (MLR), located at the junction between the midbrain and the hindbrain. It sends signals to the reticulospinal cells that in turn activate the spinal cord. The MLR is activated by forebrain structures, but the detailed organisation of those inputs has remained elusive. Dopamine neurons are involved and their contribution has traditionally been attributed to ascending projections to the basal ganglia that, in turn, project down to the MLR. We recently discovered in lampreys that the MLR receives a direct descending dopaminergic input that increases locomotor output. We also found that the descending dopaminergic pathway is conserved in higher vertebrates and its presence may be important for understanding the neuropathology of Parkinson's disease. This conference will then focus on this dopaminergic descending input and its role in controlling locomotion.