

ORGANIZATION OF BRAIN AND SPINAL CORD LOCOMOTOR NETWORKS IN LARVAL LAMPREY

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ABSTRACT

In vertebrates, brain locomotor command systems activate spinal central pattern generators (CPGs) to initiate locomotor behavior. The size and pharmacology of brain command systems are unknown, and the movements that result from these command systems have not been investigated. In addition, it is uncertain whether reciprocal coupling between right and left spinal locomotor networks is necessary for rhythmogenesis or primarily for phasing of locomotor activity.

In the present study, in semi-intact preparations from larval lamprey, stimulation in brain locomotor areas evokes swimming. In *in vitro* preparations, brain locomotor areas are confined to discrete areas of the brain and their pharmacology is similar to that of other vertebrates. These results suggest that the organization of the lamprey locomotor command system is similar to that in "higher" vertebrates. In separate experiments, results from *in vitro* preparations and whole animals demonstrated that reciprocal coupling in the spinal cord is necessary for rhythmogenesis.