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We appreciate the interest expressed by Chaouloff and colleagues in our recent review of the role of endocannabinoids in motor control. Our goal was to link cellular and synaptic mechanisms to specific aspects of motor behavior, and, therefore, we did not explicitly discuss behavioral results in intact animals such as those pointed out by Chaouloff and colleagues.

These results are indeed interesting and further support the fact that motor behavior represents the overt expression of the integrated processing of emotional, motivational, and cognitive processing in the central nervous system. In addition, they also show the pivotal role endocannabinoid receptors play in this processing and the execution of specific motor tasks.

The observed change in running behavior can be mediated by changes in the planning and selection centers in the basal ganglia as well as in the initiation and execution centers in the brain stem and spinal cord. We have previously shown that CB1 receptors are necessary for short- and long-term potentiation of the frequency of locomotor activity (1–3). An initial way to tease out the contribution of these different centers is to develop mice with CB1 receptors deleted in specific areas in the central nervous system and to evaluate the behavioral outcome in these mice.

Although some pieces are starting to fall in place in terms of linking cannabinoid receptor-mediated cellular and synaptic mechanisms to circuit operation and ultimately motor behavior, there are still unanswered questions. The development of new technologies and tools should help shed some light on some of the remaining issues in this field.

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