

## Spinal cord pathology during chronic exposure to MPTP in mice: new anatomical pathways explaining motor behavior in parkinsonism

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MPTP treatment is a widely validated model to produce experimental parkinsonism. Among different administration protocols, chronic exposure to little amounts of MPTP has been reported to reproduce neuropathological features characterizing dopaminergic neurons in human Parkinson disease [1]. Recent studies by our group have found that MPTP, besides dopaminergic neurons, affects also spinal motor neurons [2], thus bridging, at neuropathological level, Parkinson disease and Amyotrophic Lateral Sclerosis.

In the present study we show that chronic MPTP treatment, as well as acute one, is able to induce motor neurons loss in lumbar spinal cord. We have investigated the involvement of autophagy and the occurrence of alterations in alpha-synuclein immunostaining, after MPTP treatment. The activation of autophagic pathway is proved by the significant increase of MAP LC3 $\beta$  in the motor neurons of MPTP treated mice. The same neurons possess altered alpha-synuclein immunostaining, detected by two novel homemade monoclonal antibodies.

Motor neuron pathology could depend on direct effect of MPTP, but it can be also due to a remodeling in anatomical connections of motor neurons with descending pathways or intra-spinal networks. Among these, we have particularly investigated the Renshaw cells and the coeruleo-spinal noradrenaline projections, which can intervene in both physiology and survival of motor neurons [3].

Our result shed new light on the physiopathology of motor symptoms in parkinsonism and call for novel pharmacological and neurophysiological approaches to relive motor function in Parkinson disease, through modulation of spinal circuits.

### References

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