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Muscle alterations in a Parkinson's disease animal model

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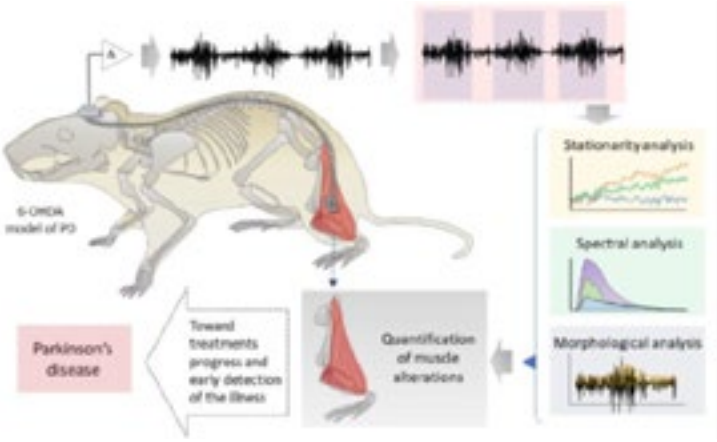
The most common Parkinson's disease animal model induces massive nigrostriatal degeneration by intracerebral infusion of 6-hydroxydopamine (6-OHDA). Motor deficits in rat models of Parkinson's disease were previously addressed in other works. However, an accurate quantification of muscle function in freely moving PD-lesioned rats over time has not been described until now. In this work we address the muscular activity characterization of a 6-OHDA-lesion model of PD along six weeks post-lesion based on spectral and morphological analysis of the signals. Using chronic implanted EMG electrodes in a hindlimb muscle of freely moving rats, we have evaluated the effect of the PD neurotoxic model in the muscular activity during locomotion. EMG signals obtained from animals with different time post-injury were analyzed. Power spectral densities were characterized by the mean and median frequency and the EMG burst stationarity was previously verified for all animals. Our results show that as the time post-lesion increases both frequency parameters decrease. Probability distribution function analysis was also performed. The results suggest that contractile dynamics of the biceps femoris muscle change with time post-lesion. We have also demonstrated here the usefulness of frequency parameters as biomarkers for monitoring the muscular function changes that could be used for early detection of motor dysfunction.



Recent publications:

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Biography

Albarracín is specialized in neurophysiology. Her initial scientific research focused on the peripheral nervous system of the vibrissal system. She has extensive experience in extracellular electrophysiological and patch-clamp techniques in anesthetized and in live animals. Her most important contributions in the sensorial vibrissal system are related to neuronal coding in the vibrissal system, specifically in the texture discrimination code. However, her most recent research is carried out in the neurodegenerative diseases field; specifically she is working on motor deficits and biomechanical aspects in an animal model of Parkinson's disease. These studies include gait studies and analysis of muscular and cortical electrical activity in live animals in order to establish biomarkers related to the pathology.

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