

## Biomaterials

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## Microscopical alterations of the anterior tibial muscle after sciatic nerve crushing treated with lasertherapy and natural latex protein

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Peripheral nerve injury results in damage not only to nerve tissue, but also to muscle that is affected by various changes [1], [2] because the nerve injury compromises the nerve supply of the muscular tissue, restoration and function preservation of this structure [3]. This study evaluated the tibialis anterior muscle after sciatic nerve crush (15 kgf, 5.2 MPa, 10 min) treated with low level laser therapy (LLLT, 15J/cm<sup>2</sup>, 780nm) and the protein purified from natural latex (P1, 0.1%). It was used 60 Wistar rats, male, 200-250g, which were divided into 6 groups (n = 10): G1. control; G2. exposed nerve; G3. injured nerve; G4. injured nerve irradiated with LLLT; G5. injured nerve treated with protein extracted of the latex, and G6 injured nerve treated with protein and irradiated. After 4 or 8 weeks of the injury, morphological (hematoxylin-eosin) and histochemical (NADH – nicotinamide adenine nucleotide, and SDH – succinate dehydrogenase) analyses were performed. Morphological data of the treated groups after nerve injury (G4, G5 and G6) showed improvement of these parameters in comparison with the injured group (G3), in both periods. After 8 weeks, the morphological aspects of the treated groups resembled the control group, G5 presented the best results, at 4 and 8 weeks after nerve injury. The NADH and SDH data of injured animals showed loss of the fibers typing, increasing the intermediary fibers areas, which was more evident at 4 weeks after the injury, and reduced aspects after 8 weeks. For the last period of time, the distribution of fiber types more similar to the control group, according to the NADH reaction, was the G5 groups, and for SDH reaction was the G6 group. In conclusion, the treatments applied on the injured sciatic nerve led to improved morphology and oxidative metabolism of the anterior tibial muscle. The loss typing of the fibers was common at four weeks after the lesion, and in general, the treatment performed with only the protein extracted from the latex was the most efficient, revealing no positive integration between the protein and the LLLT treatment, according to the parameters used in this study.

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