

The Effect of Low-Level Laser Therapy (LLLT) Applied Prior to Muscle Injury

Beatriz Guimarães Ribeiro, MSc,¹ Agnelo Neves Alves, MSc,¹ Lucas Andreo Dias dos Santos, MSc,² Kristianne Porta Santos Fernandes, PhD,^{1,2} Tatiane Matarazzo Cantero, BS,³ Mariana Teixeira Gomes, BS,² Cristiane Miranda Franc, a, PhD,² Daniela de F_ atima Teixeira da Silva, PhD,² Sandra Kalil Bussadori, PhD,^{1,2} and Raquel Agnelli Mesquita-Ferrari, PhD

^{1,2_}

¹Rehabilitation Sciences, Universidade Nove de Julho – UNINOVE, São Paulo – SP, Brazil

²Biophotonics Applied to Health Sciences, Universidade Nove de Julho – UNINOVE, São Paulo – SP, Brazil

³Universidade Nove de Julho – UNINOVE, São Paulo – SP, Brazil

Aim: To evaluate the effect of LLLT (780 nm; 10 J/cm², 40mW, 3.2 J) prior to injury on the morphological analysis, collagen deposition, and activity of matrix metalloproteinase-2 (MMP-2).

Methods: Wistar rats were divided into groups: control; sham; only LLLT; only muscle injury and LLLTþ injury. The rats were euthanized at 1, 3, and 7 days following cryoinjury to muscle that was removed for analysis.

Results: LLLT applied prior to muscle injury led to a reduction in myonecrosis and inflammatory cells, an increase of blood vessels and immature muscle fibers. An increase in MMP-2 activity and a decrease in collagen deposition were also found, with a better collagen organization and distribution.

Conclusion: LLLT applied immediately prior to injury had positive effects during the muscle regeneration process. Therefore, this resource may have considerable therapeutic value, especially for athletes who practice sports in which there is a constant risk of muscle injury. *Lasers Surg. Med.* 47:571–578, 2015. © 2015 Wiley Periodicals, Inc.