

# Transcutaneous systemic photobiomodulation reduces lung inflammation in experimental model of asthma

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## Abstract

Asthma is a chronic inflammatory disease characterized by recurrent and reversible episodes of wheezing, dyspnea, chest stiffness and cough. Its treatment includes several drugs, high cost, and considerable side effects. Photobiomodulation (PBM) emerge as an alternative treatment, showing good results; and it can be applied locally or systemically. Here, we aim to evaluate the effect of transcutaneous systemic photobiomodulation (TSPBM) by red diode light. Therefore, adult rats were sensitized and challenged with ovalbumin (OVA) plus alum for induction of asthma and irradiated or not with TSPBM in the caudal vein (Wavelength  $660 \pm 10$  nm; Total Radiant Emission 15 J; Area 2.8 cm<sup>2</sup>; Energy density 5.35 J/cm<sup>2</sup>; Irradiance 33.3 mW/cm<sup>2</sup>; Exposure time 150 s). Our investigations prioritized the cell migration into the alveolar space and lung, tracheal responsiveness, release and gene expression of cytokines, mast cell degranulation, and anaphylactic antibodies. Our results showed that TSPBM reduced the cell migration and mast cell degranulation without alter the tracheal responsiveness and ovalbumin antibody titers. Indeed, TSPBM increased the levels of interleukin 10 (IL-10) in the BAL fluid without alter the gene expression of cytokines in the lung tissue. Thus, this study showed that transcutaneous systemic irradiation reduced lung inflammation by altering mast cells degranulation and IL-10 level. Further studies, investigating different dosimetric parameters are needed in order to improve the effects of the TSPBM.

## Recent Publications \

**DE SOUZA, VANESSA**; SALLOUM ZEITOUN, SANDRA ; TAKAO LOPES, CAMILA ; DIAS DE OLIVEIRA, ANA PAULA ; DE LIMA LOPES, JULIANA ; BOTTURA LEITE DE BARROS, ALBA LUCIA . Clinical usefulness of the definitions for defining characteristics of activity intolerance, excess fluid volume and decreased cardiac output in decompensated heart failure: a descriptive exploratory study. Journal of Clinical Nursing (Print) **JCR**, v. May, p. n/a-n/a, 2015.

**DE SOUZA, VANESSA**; ZEITOUN, SANDRA SALLOUM ; LOPES, CAMILA TAKAO ; DE OLIVEIRA, ANA PAULA DIAS ; **LOPES, JULIANA DE LIMA** ; DE BARROS, ALBA LUCIA BOTURA LEITE . Content Validation of the Operational Definitions of the Nursing Diagnoses of Activity Intolerance, Excess Fluid Volume, and Decreased Cardiac Output in Patients With Heart Failure. International journal of nursing knowledge **JCR**, v. 3, p. n/a-n/a, 2013.

**DE SOUZA, VANESSA** ; ZEITOUN, SANDRA SALLOUM ; **BARROS, ALBA LUCIA BOTTURA LEITE DE** . Débito cardíaco diminuído: revisão sistemática das características definidoras. Acta Paulista de Enfermagem (UNIFESP. Impresso) **JCR**, v. 24, p. 114-119, 2011.



## Biography (150 word limit)

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## References:

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