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### Researches Classified – Panels Award – Basic Area

#### The inflammatory nitric oxide mechanism and its participation in cardiac tissue injuries

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**Introduction:** Nitric oxide exerts an important effect on the mediation of chemical processes, on the transmitting and signaling action on the inflammatory response in different pathological disorders. It has a vasodilatory effect and modulates inflammatory or anti-inflammatory reactions, depending on the cell type and the stimulus. It has the power to produce hemodilation in the muscles (it dilates the blood vessels increasing the blood flow); by this factor, one can associate the greater blood flow with the muscular recovery, process that ends up becoming faster.

**Objective:** Understand the mechanisms by which nitric oxide acts on cardiac lesions and the inflammatory response.

**Methodology:** The databases of CAPES, PubMed and SciELO were used as sources of search. The articles went through a selection filter so that those of greater scientific relevance were selected, based on the selection of articles published in the last 7 years in impact journals. The keywords used in the search include: "nitric oxide" and "heart" or "heart disease" or "heart failure" and "inflammatory mechanism".

**Results:** Since its discovery, nitric oxide has been intriguing researchers about its multiple actions in the human body, as well as in the pharmaceutical industry for its applicability to active drug components. Nitric oxide has already been associated with several functions, emphasizing its importance in vascular relaxation and signaling in inflammatory processes controlling them, being produced locally in the vessels or when inflammation occurs. In some situations, the vasodilatory effect of nitric oxide can be considered potentially beneficial when analyzed in cardiac lesions, to be included in myocardial ischemia. It is noteworthy that nitric oxide in high concentrations may exert a toxic effect, and it occurs in situations of oxidative stress, generation of oxygen intermediates and deficiency of the antioxidant system. Thus, it is clear the importance of a better understanding of nitric oxide, how it acts beneficially in some lesions, what their molecular roles are, to what extent their production leads to toxicity, as it acts in the inflammatory processes of cardiac lesions. Its role in cardiac lesions varies from protection to aggression depending on the amount present in the medium and degree of injury. The major study lesions that alter the nitric oxide balance in cardiac tissue include myocardial ischemia, acute myocardial infarction, and myocardial hypertrophy. Furthermore, plasma levels of nitric oxide are increased in mice infected with *T.cruzi* (experimental model of Chagas' disease).

**Discussion and conclusion of the results:** Considering the points discussed, it is concluded that nitric oxide plays a crucial role in cardiac lesions, which has a marked influence on the prognosis and clinical evolution of the cardiac lesion. Still, it can aggravate your picture, worsening general condition, when in inadequate concentrations; or improves it when administered and controlled exogenously, providing better perfusion, and reduction in the formation of atherosclerotic plaques, reduction of ischemia among many other functions.

**Keywords:** Nitric oxide; Heart disease; Inflammation.