

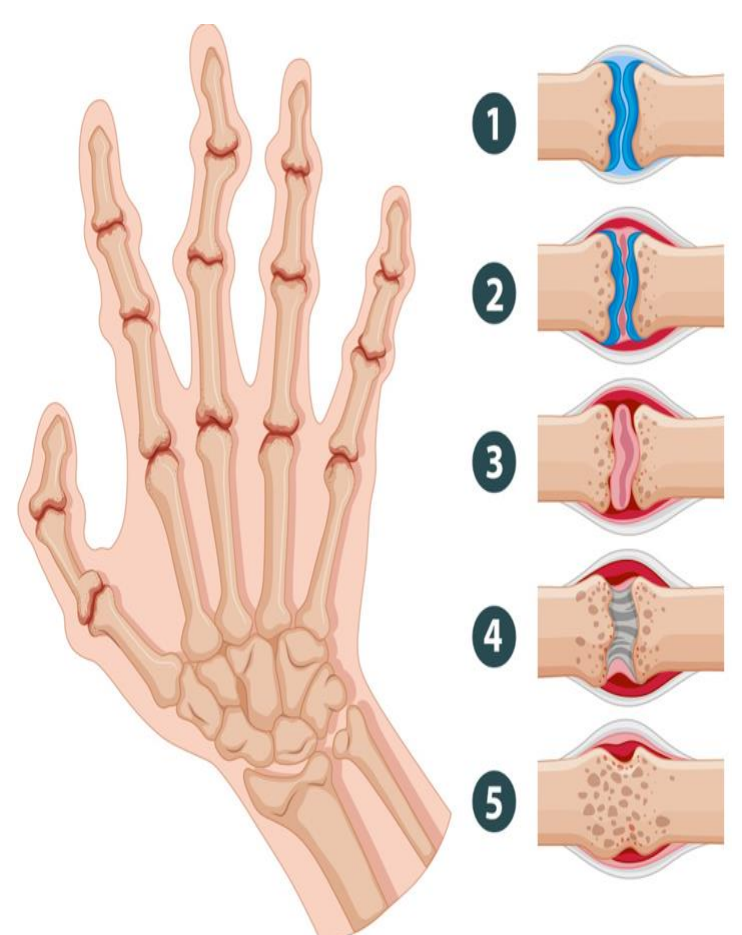
# PHOTOBIOMODULATION THERAPY REDUCES LEVELS OF MMPs AND TNF- $\alpha$ , CONTROLLING TISSUE DEGRADATION, PROMOTING MAINTENANCE OF CARTILAGE RESISTANCE, IN AN EXPERIMENTAL MODEL OF RHEUMATOID ARTHRITIS.

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## INTRODUCTION:



Rheumatoid Arthritis (RA) is a chronic inflammatory, autoimmune, systemic and progressive disease that leads to irreversible destruction of cartilage and bone. In vivo and in vitro experimental studies using photobiomodulation therapy have shown positive effects on the modulation of factors that cause disease progression.

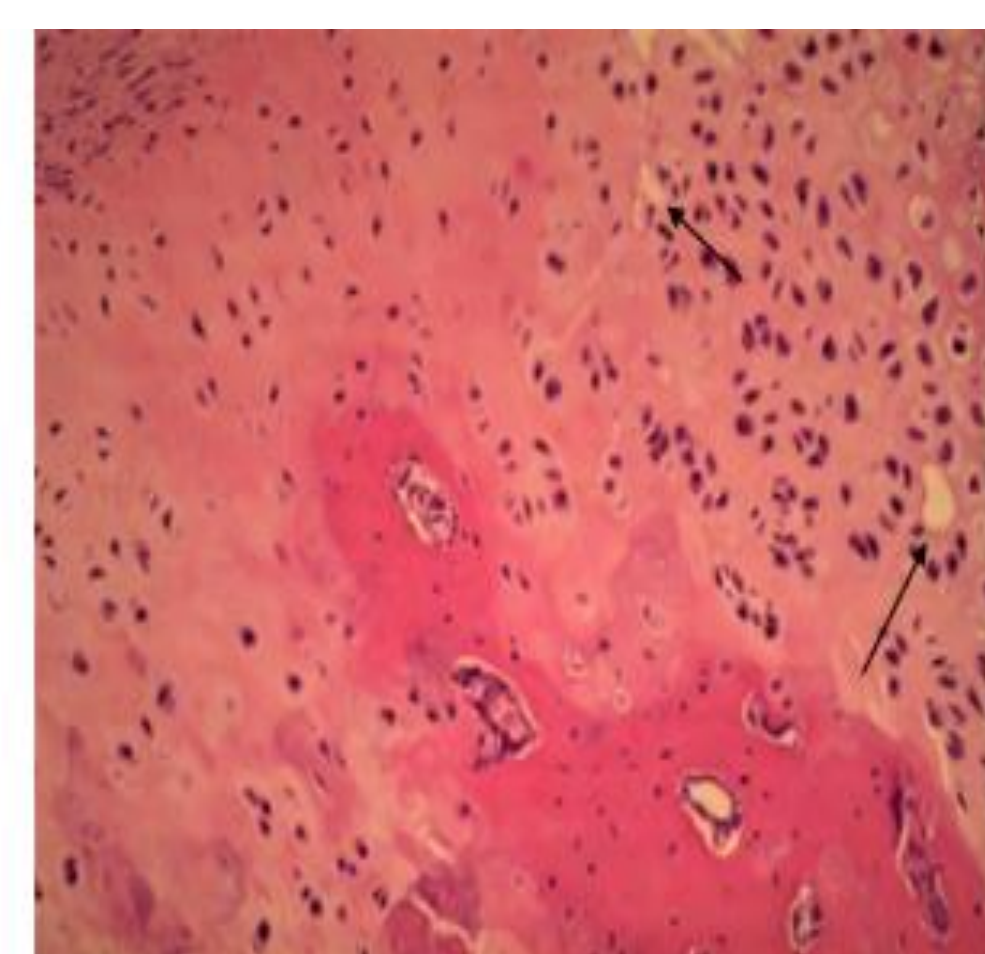
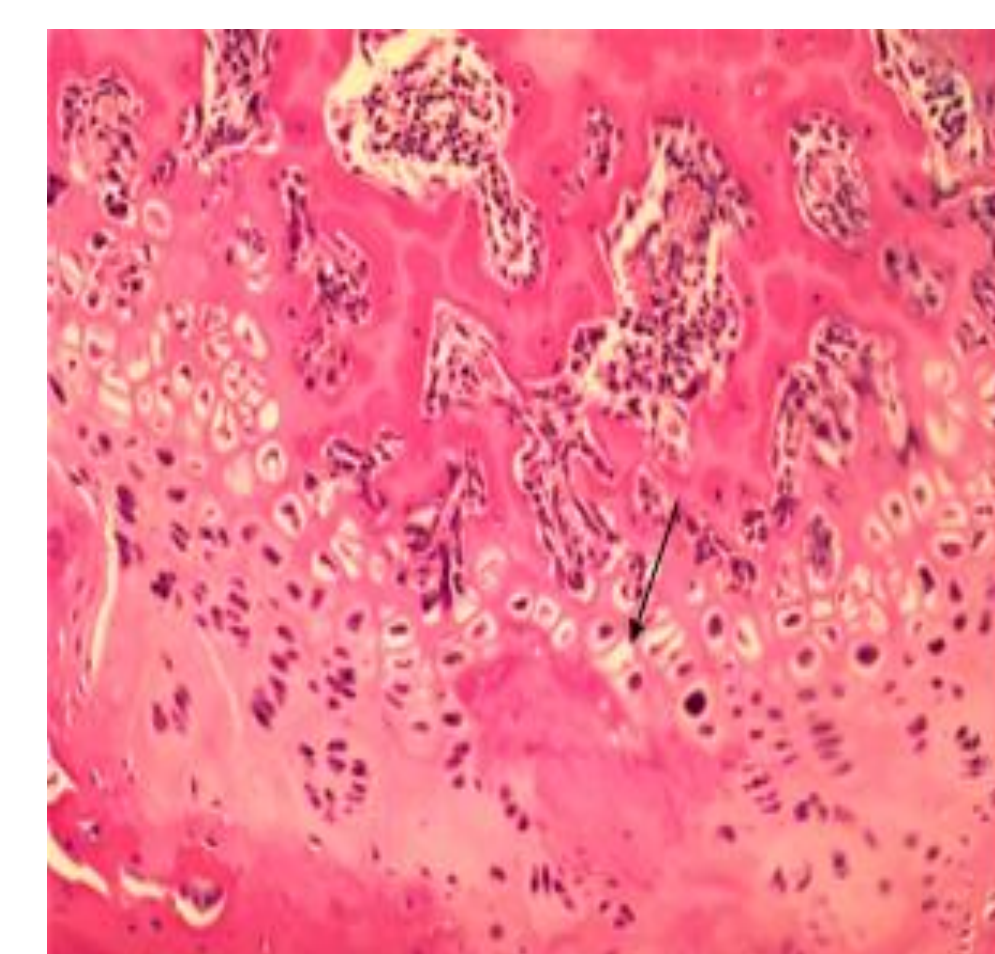
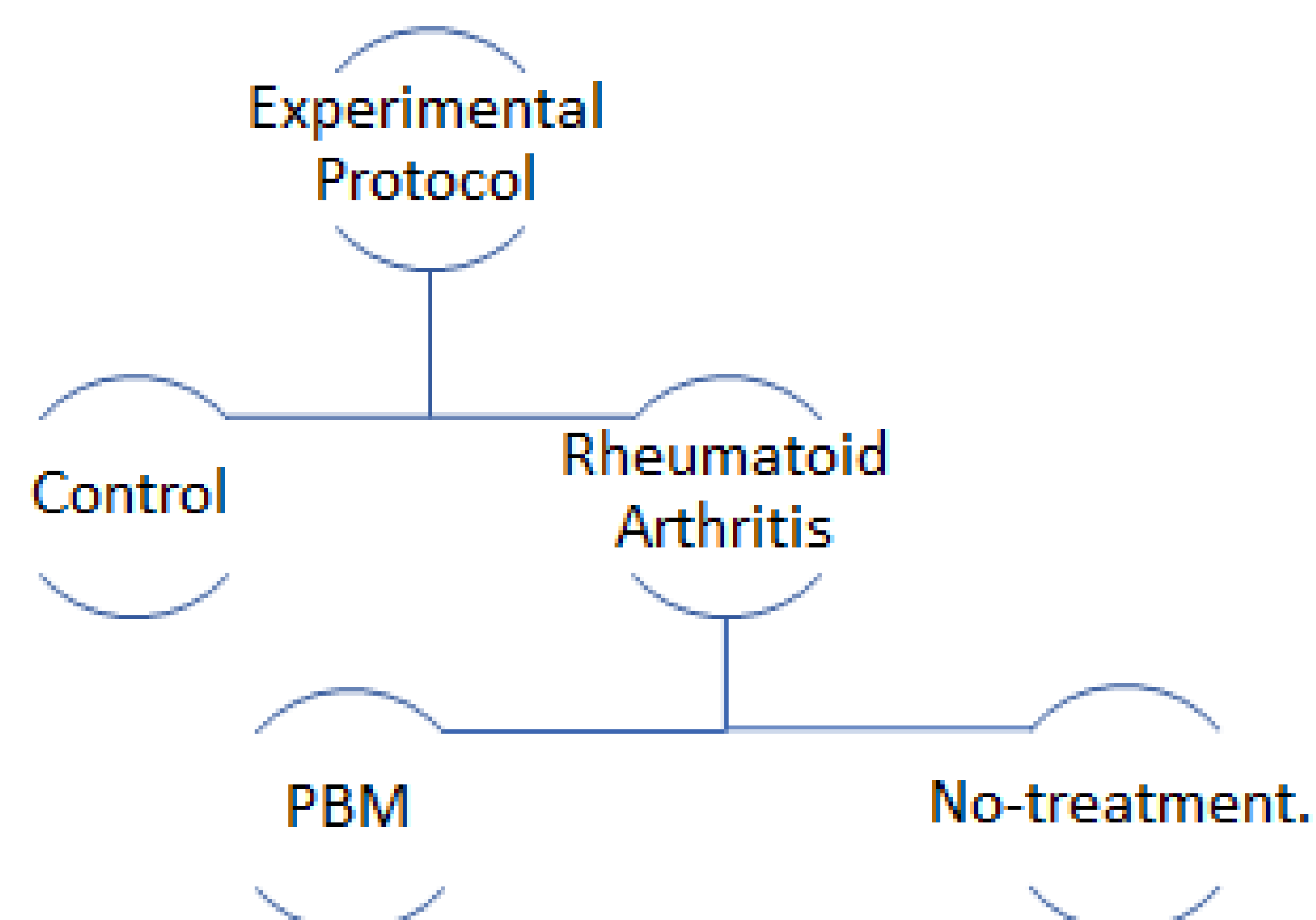
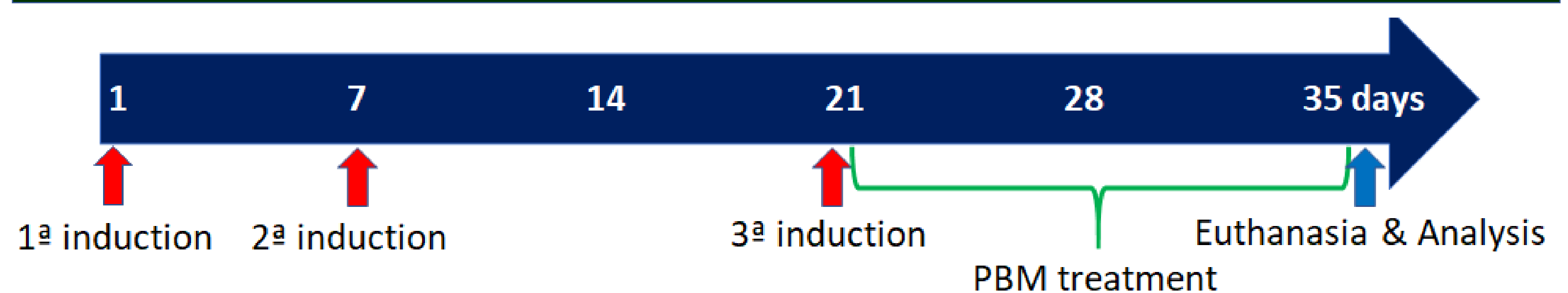
## OBJECTIVE:

The objective of this work was to evaluate the effects of photobiomodulation therapy in the treatment of induced Rheumatoid Arthritis (RA) in relation to biochemical and functional aspects.

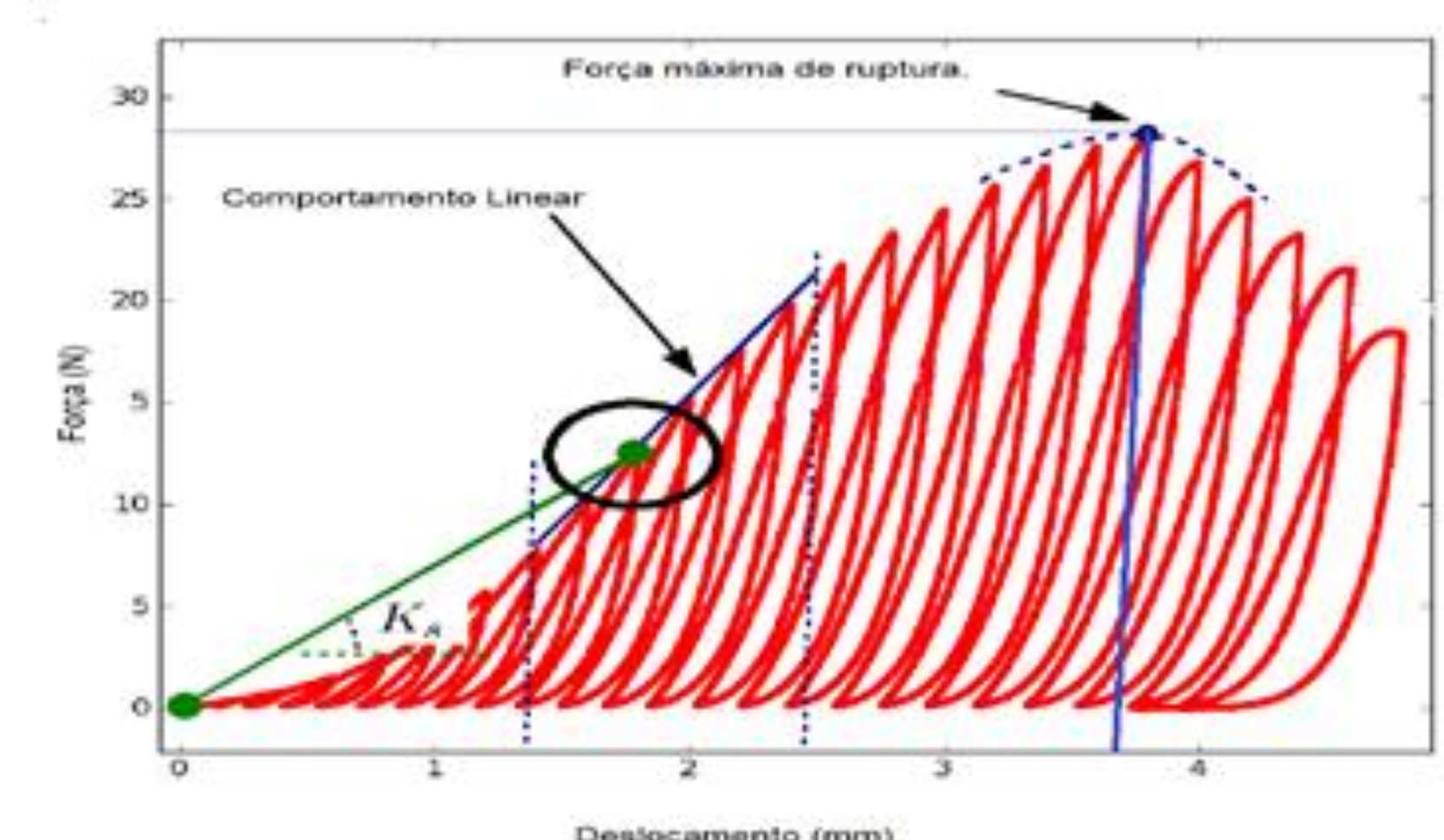
## MATERIAL AND METHODS:

Wistar rats will be used, divided into groups, CTL (control), RA (Rheumatoid Arthritis), and RA + PBM. For the induction of RA, 3 injections of the lesion-induction solution (CIA) will be used on days 1, 7 and 21 days after last induction. For groups that will receive PBM treatment (808 nm; 2J; 100mW) irradiation will be started immediately after the last induction. The strength (Fmax) and maximum deformation (Dmax) supported by the cartilage until the moment of rupture will be evaluated. The quantification of the gene expression of MMPs 2, 9, 13 and TNF- $\alpha$  will be performed.

## EXPERIMENTAL PROTOCOL :



wave-length (nm)	808
Active Medium	AsGaAl
Power (mW)	50
Beam área (cm <sup>2</sup> )	0,028
Irradiance (W/cm <sup>2</sup> )	1,78
Energy (J)	2
Fluency (J/cm <sup>2</sup> )	71,4
Time (Seg.)	40



## HYPOTHESIS:

Increase in the inflammatory process is expected after the induction of rheumatoid arthritis. Photobiomodulation therapy (PBM) may promote the reduction of the joint inflammatory process with functional improvement. Reduction of the inflammatory marker TNF- $\alpha$  and control of matrix metalloproteinases (MMPs) are expected. All this control of the disease may reflect in the improvement of the mechanical properties of the cartilage.

## REFERENCES:

- Dos Santos SA, dos Santos Vieira MA, Simões MCB, Serra AJ, Leal-Junior EC, de Carvalho P de TC. Photobiomodulation therapy associated with treadmill training in the oxidative stress in a collagen-induced arthritis model. Lasers Med Sci. 2017;32(5):1071–9.
- Carolina Araruna Alves A, de Tarso Camillo de Carvalho P, Parente M, Xavier M, Frigo L, Aimbire F, *et.al.* Low-level laser therapy in different stages of rheumatoid arthritis: a histological study. [cited 2018 Oct 18]; Available from: <https://link-springer-com.ez345.periodicos.capes.gov.br/content/pdf/10.1007%2Fs10103-012-1102-7.pdf>.