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Introduction

Chronic exposure to inflammatory bowel disease (IBD) is associated with an increased risk of developing colon cancer¹. Chronic inflammation acts as a colonic neoplastic driver with Nuclear Factor kappa B (NF- κ B) pathway playing a crucial role promoting cell proliferation and survival². The Azoxymethane/Sodium Dextran Sulfate (AOM/DSS) model is used to induce of colon cancer associated with colitis in mice and has helped elucidate the role of inflammation in the process of tumorigenesis of the colon³.

Aerobic exercise of low-moderate intensity demonstrates systemic anti-inflammatory effects with reduction in IBD progression in rodent models and patients^{4,5}. Exercise also seems to exert a preventive and anti-tumoral effect in rodent models of colon carcinogenesis^{6,7}. However, it is not clear the impact of the exercise and its better moment of intervention about the formation of colon tumors favored by chronic inflammation.

Methodology

75 Balb/C mice (adult males, 7 weeks of age) born and raised in the breeding room of the Inca Research Center (CPQ-INCA) will be divided in four experimental groups (Figure2).The moderate-intensity swimming protocol (Figure1, five times per week, for six weeks) will be carried out in a polyethylene box with a capacity of 36 liters (dimensions 21 x 39 x 60 cm) filled with waterpreheated at (33 ° + 2 ° C). The training intensity will be established by the determination of the maximal lactate stade-state in the control group (MLSS).

Western Blot and ELISA will be use to the quantification of key pro and anti-inflammatory factors in plasma and colon tissue (COX-2, IL-1 β , TNF- α , INOS, IFN- γ , IL-1ra, IL-15 and IL10) as well as NF- κ B and PGC-1 α in colon tissue only.

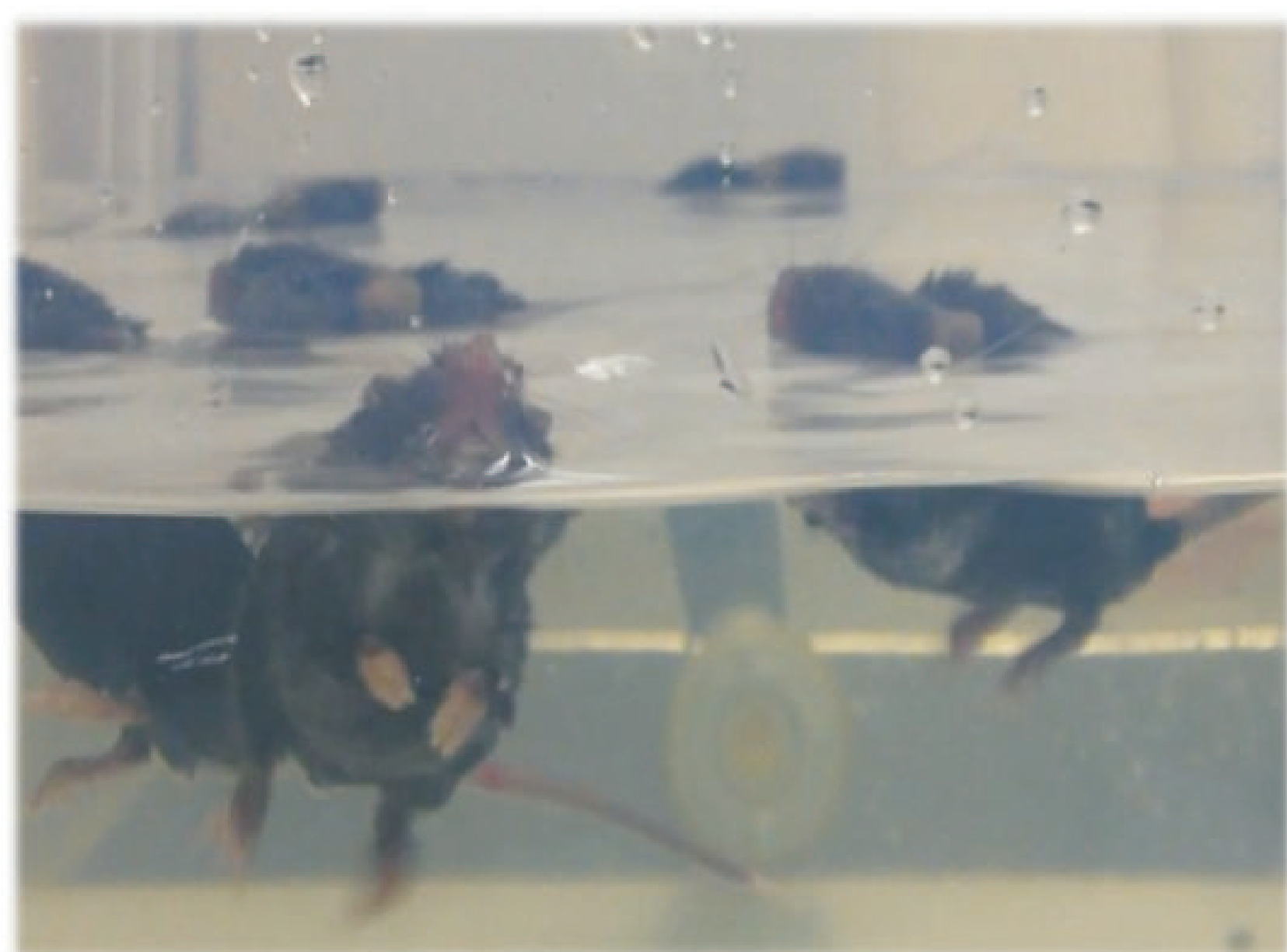


Figure 1. Swimming protocol

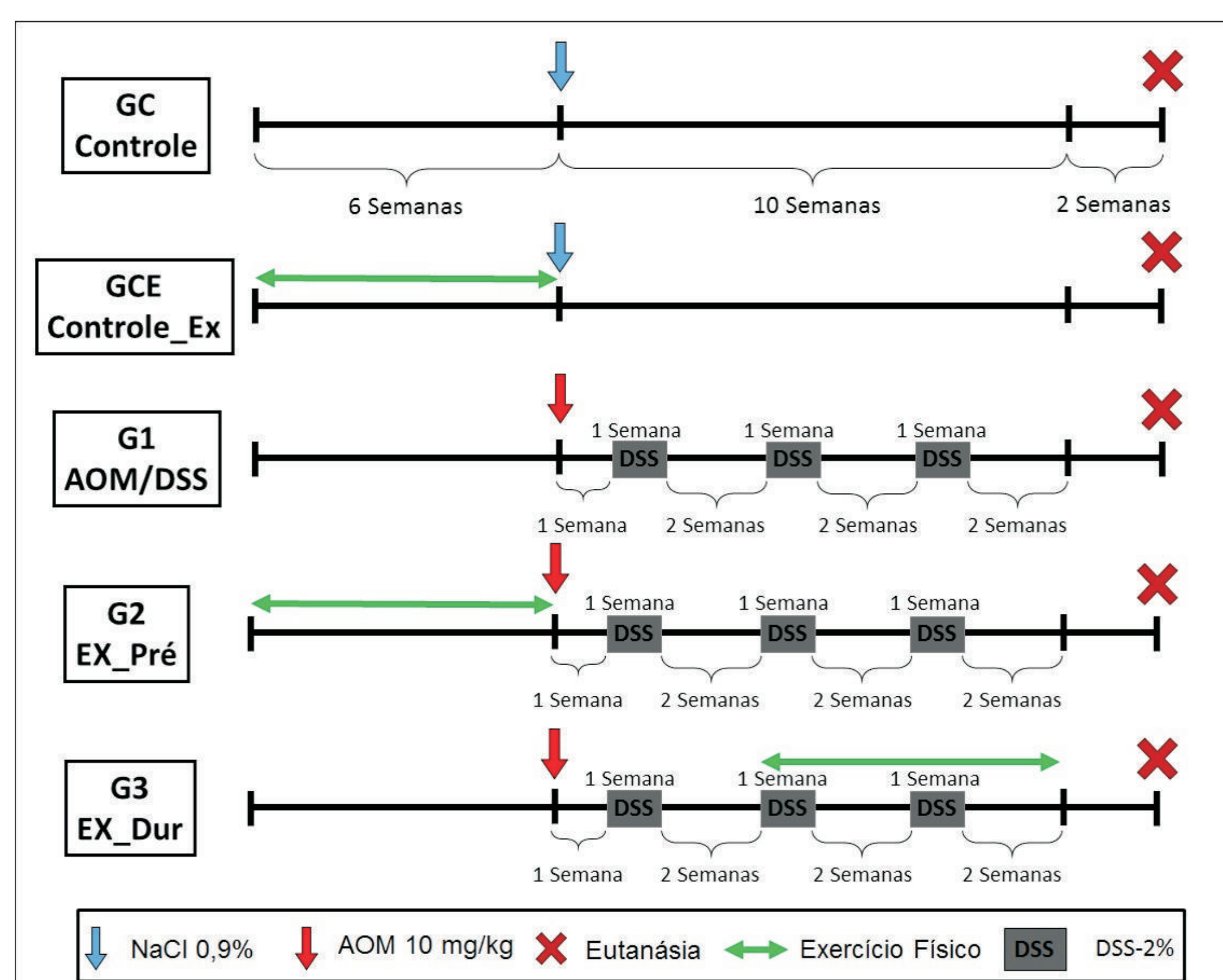


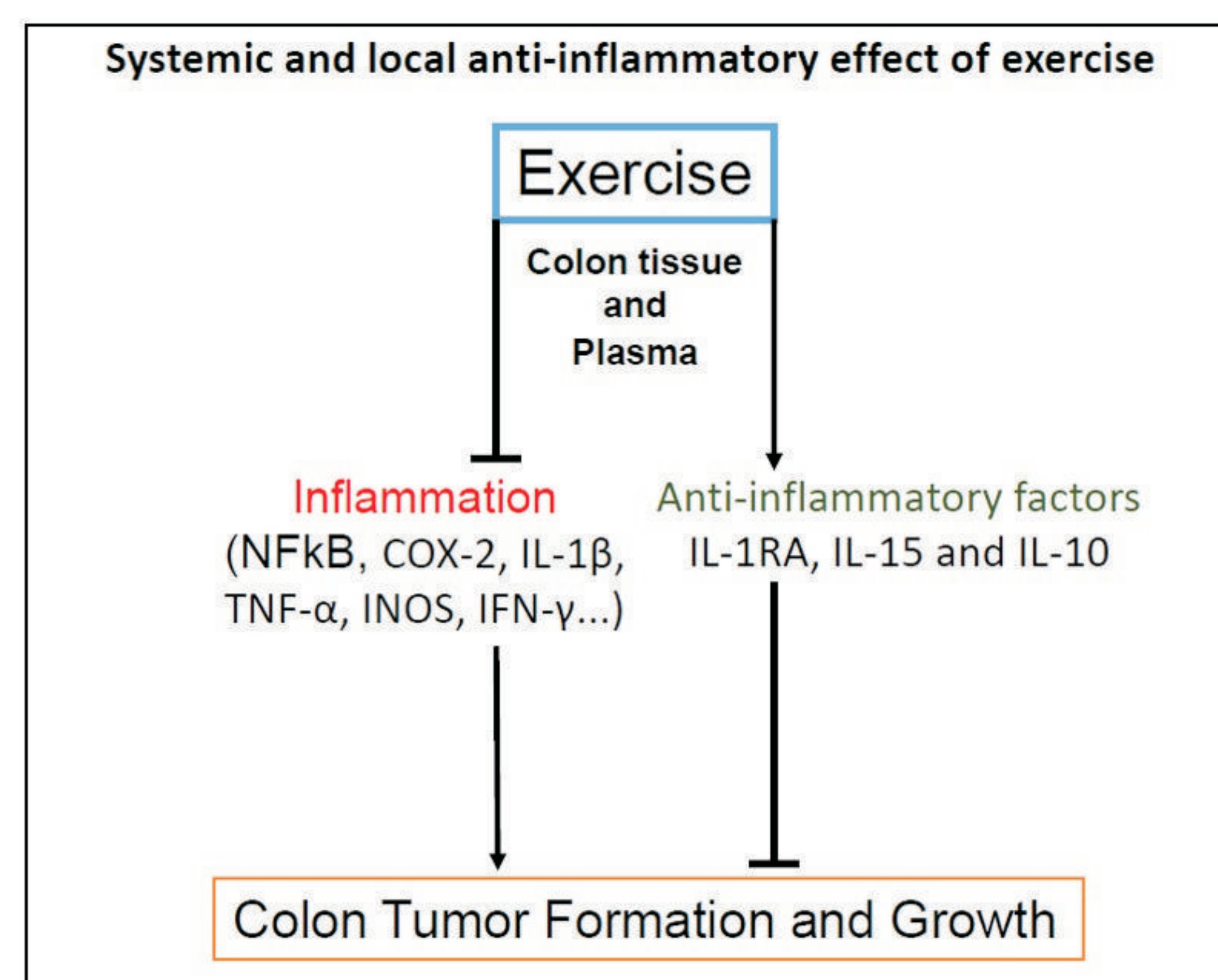
Figure 2. Experimental design. Blue arrow: application of saline solution; Red arrow: application of AOM (10mg/kg); Red X: euthanasia; Green double arrow: Exercise protocol. Gray box: DSS at 3% in water ad libitum; Keys indicate the intervals between activities.

Objectives

The primary endpoint of this project is to investigate the effects of moderate aerobic exercise on the formation, multiplicity and size of colon tumors in Balb/c mice treated with colonotropic carcinogenic inducer azoxymethane (AOM) and inflammatory promoter dextran sodium sulfate (DSS).

The secondary endpoints included: molecular anti-inflammatory regulation of exercise, and investigate if time-effect matters at latter stages of colon tumorigenesis.

Hypothesis



References

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