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Development of Ovalbumin-Lipopolysaccharide induced Vasculitis in rats - An experiment animal model

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Abstract

Vasculitis is considered a hidden factor for many pathological conditions, and thus, there is a need to develop a distinctive animal model to aid drug testing. Studies reported that the adjunct use of antigens, ovalbumin, and lipopolysaccharide exaggerates inflammation. However, to date, none has established the effect of Ova and LPS individually or in combination in vasculitis induction. The study aimed to investigate the effect of ovalbumin and lipopolysaccharide on vasculitis induction in rats. The rats were sensitized with Ova and challenged with LPS. The sensitization and challenge in rats have shown a significant increase in circulating inflammatory cells, Erythrocyte Sedimentation Rate (ESR), Inflammatory cytokines (IL-1β, IL-6, and TNF-α), C-reactive protein (CRP), ANCA (Anti-MPO, Anti-PR3), liver function enzymes (AST, ALT), kidney damage markers (BUN, Creatinine) in the serum. MMP-9 level was significantly increased in the temporal, carotid, aorta, iliac, mesentery, and coronary arteries. We also found the disease control group developed hematuria and proteinuria, which was incomparable to the normal control. Furthermore, the histopathology suggested significant neutrophil infiltration with fibrinoid necrosis, indicating vascular injury and hyperplasia, resulting in extracellular matrix degradation. Thus, we conclude that the ovalbumin and lipopolysaccharide, in combination, have developed vasculitis like conditions, which suggest OVA-LPS as a possible new experimental model for vasculitis and could be considered in future therapeutic studies.

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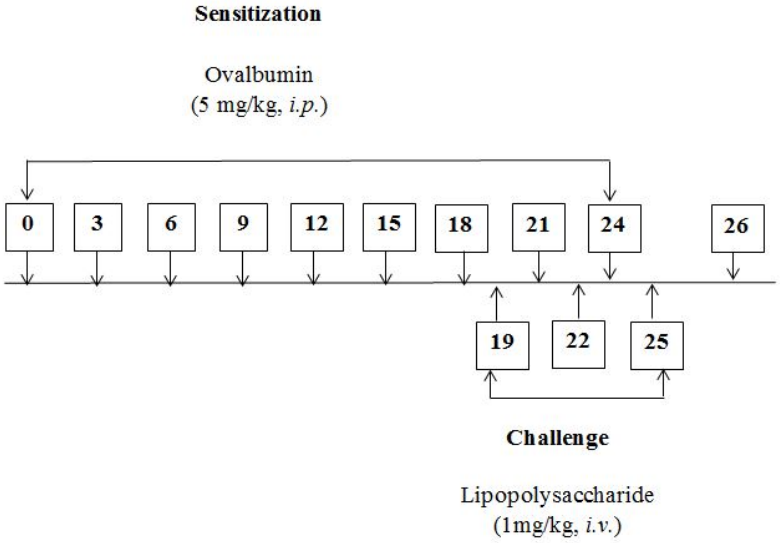

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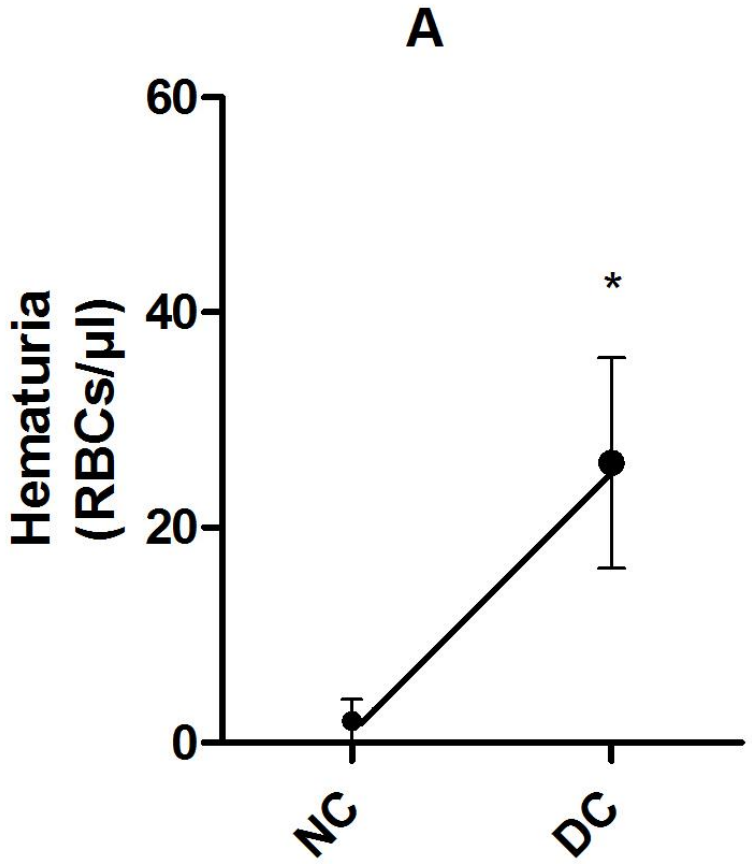

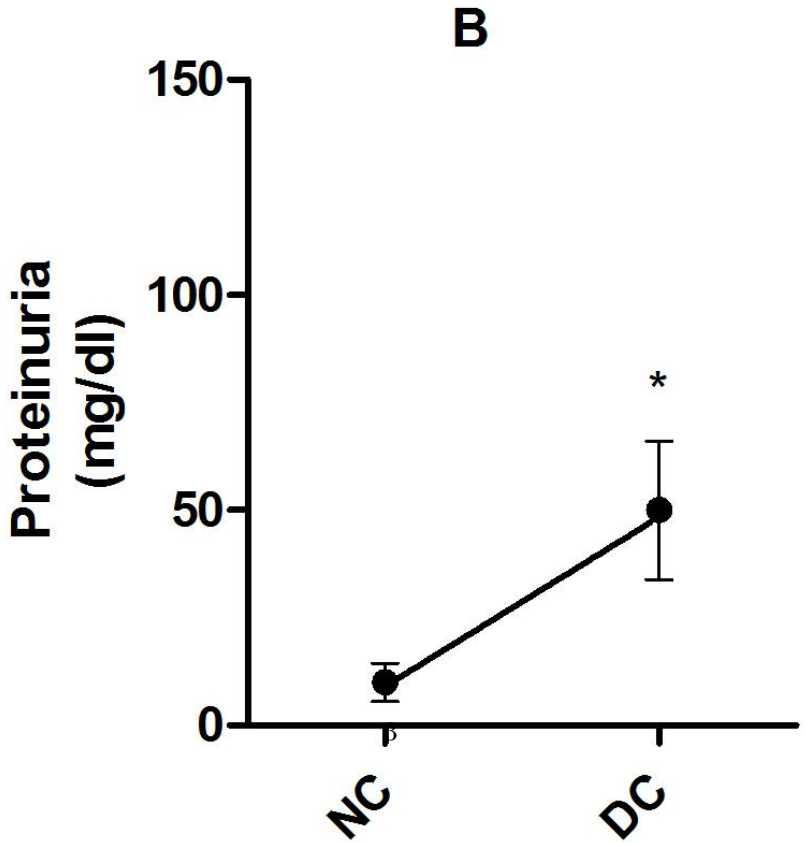

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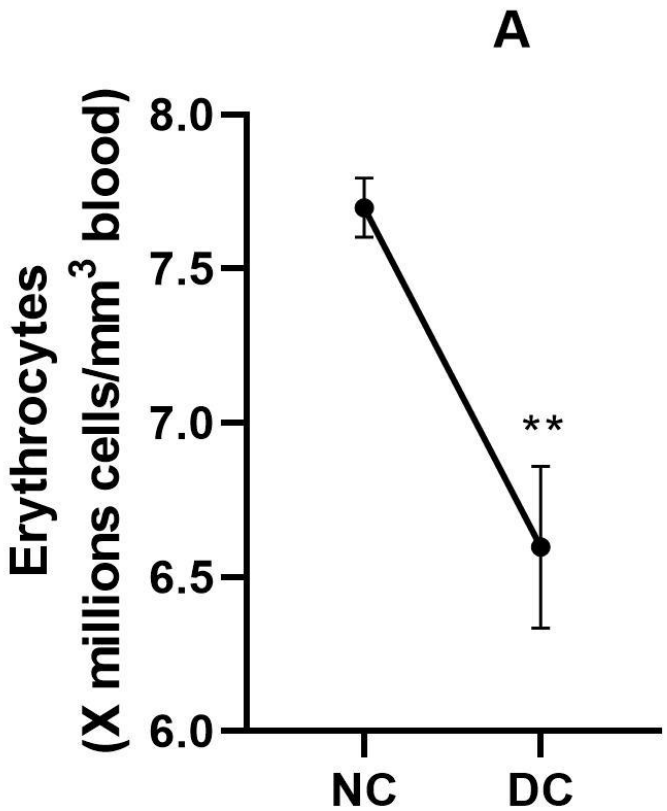

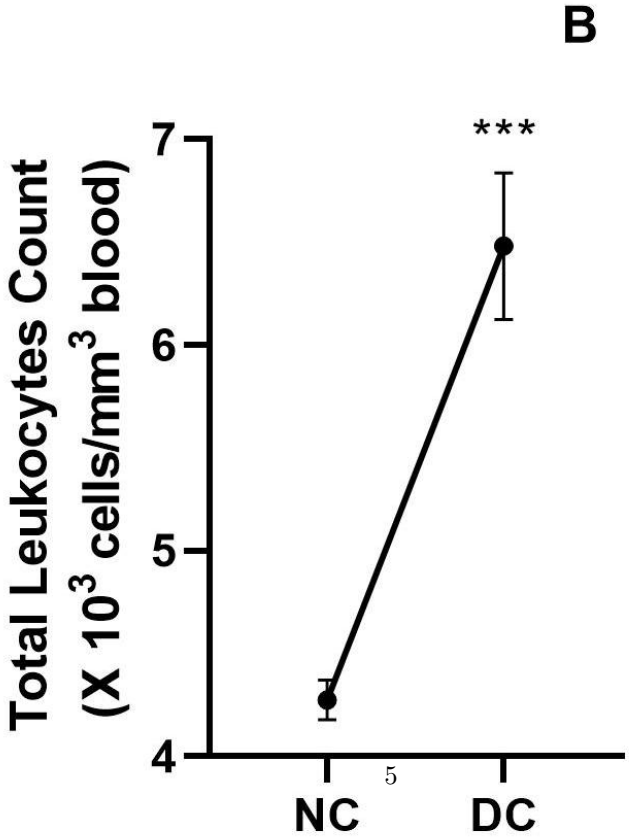

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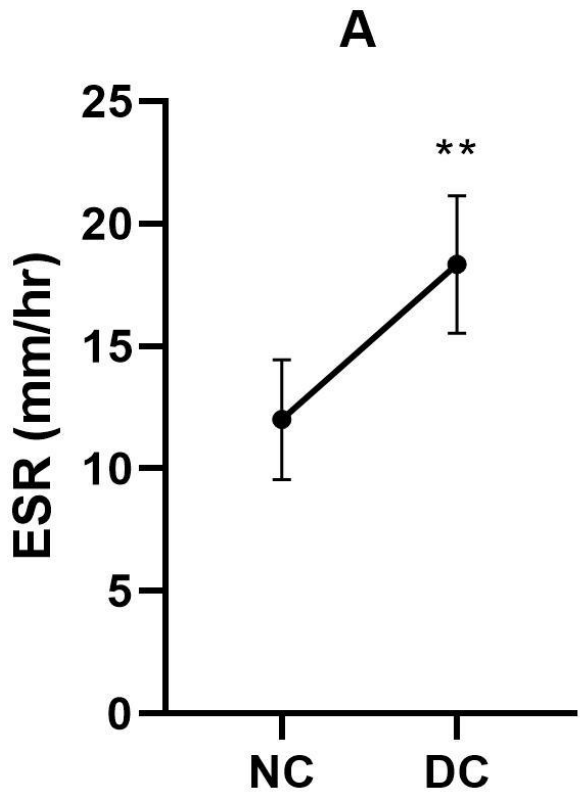

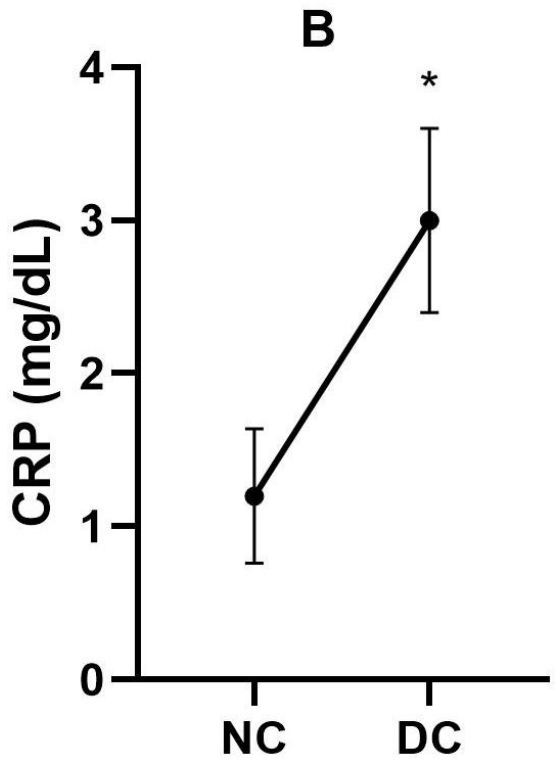

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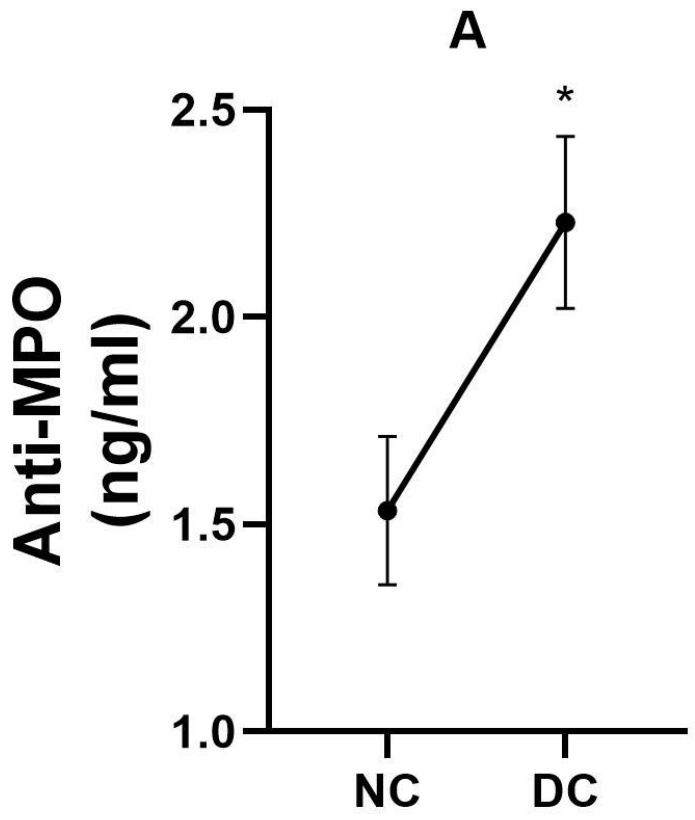

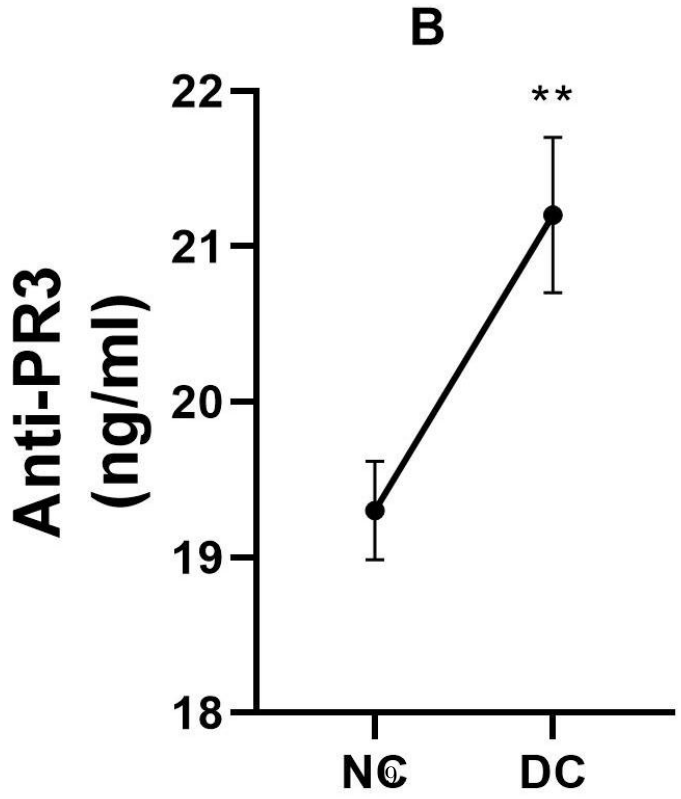

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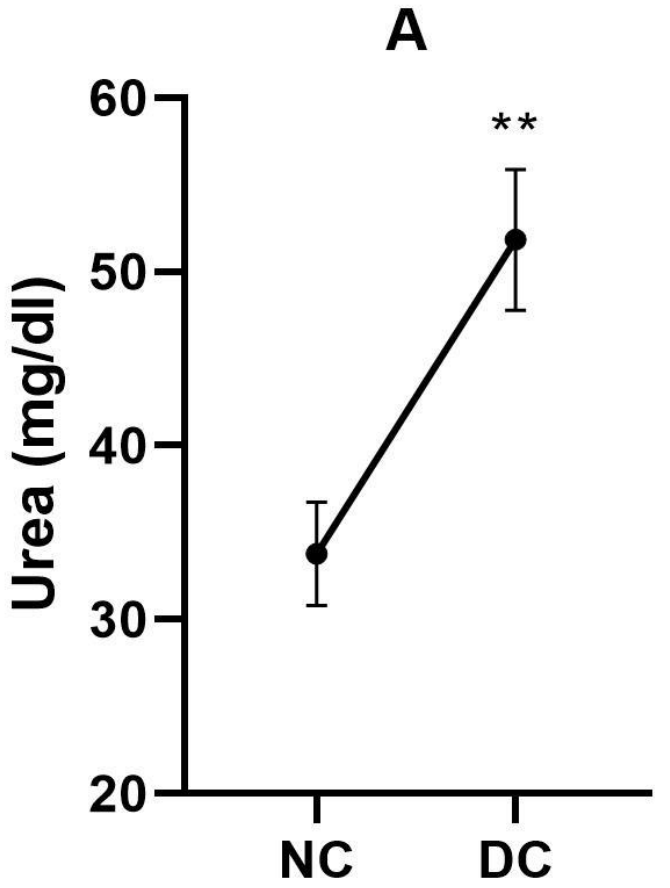

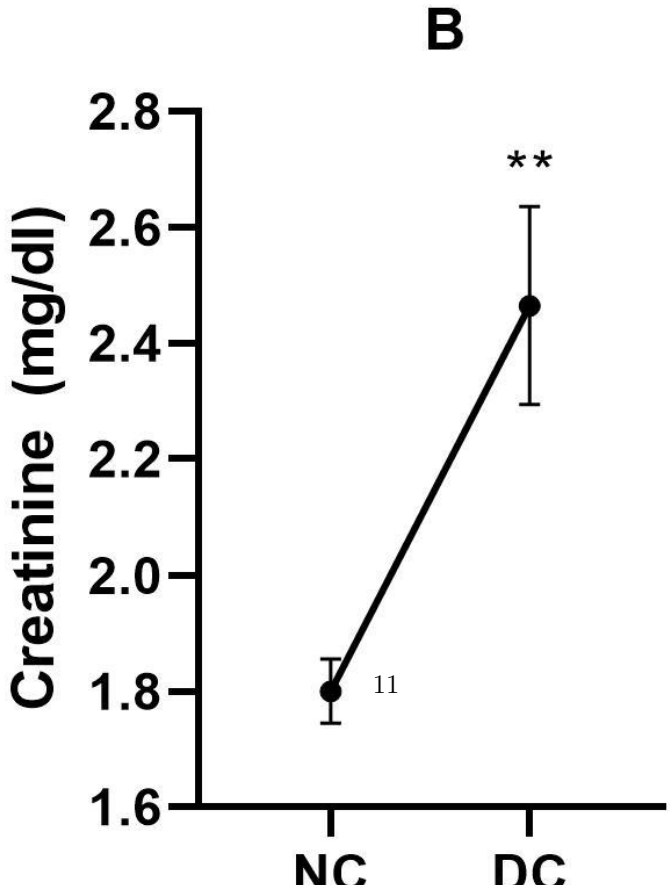

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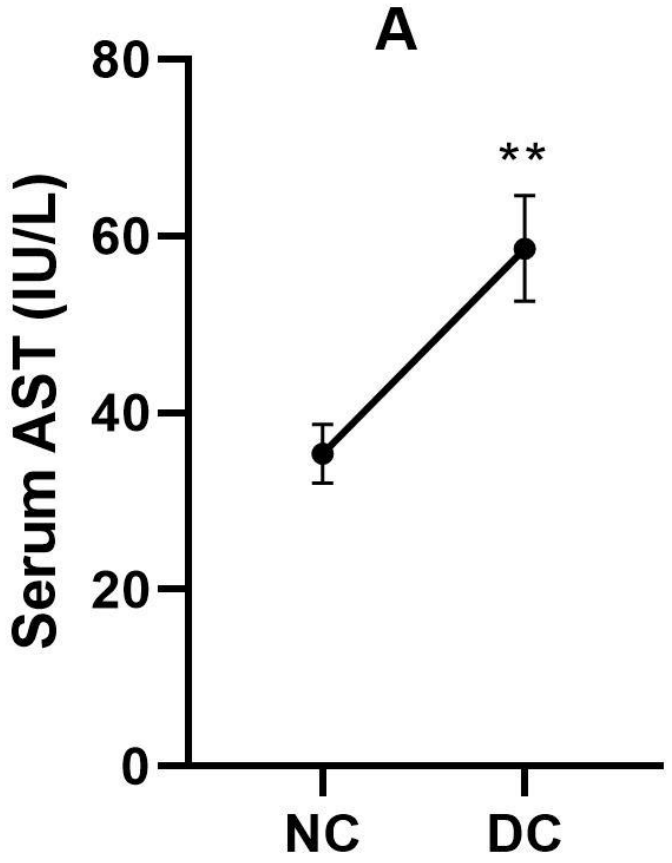

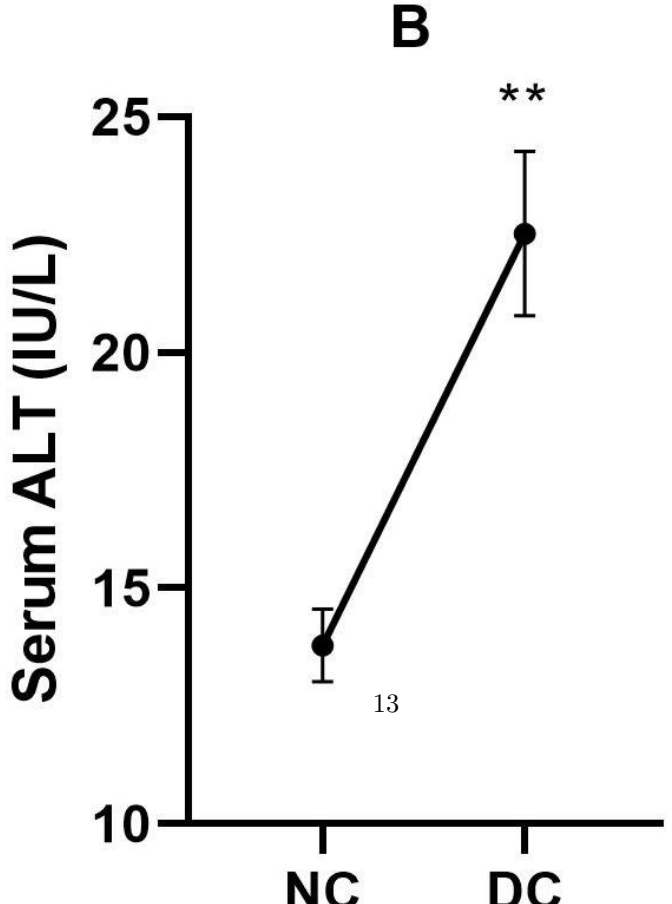

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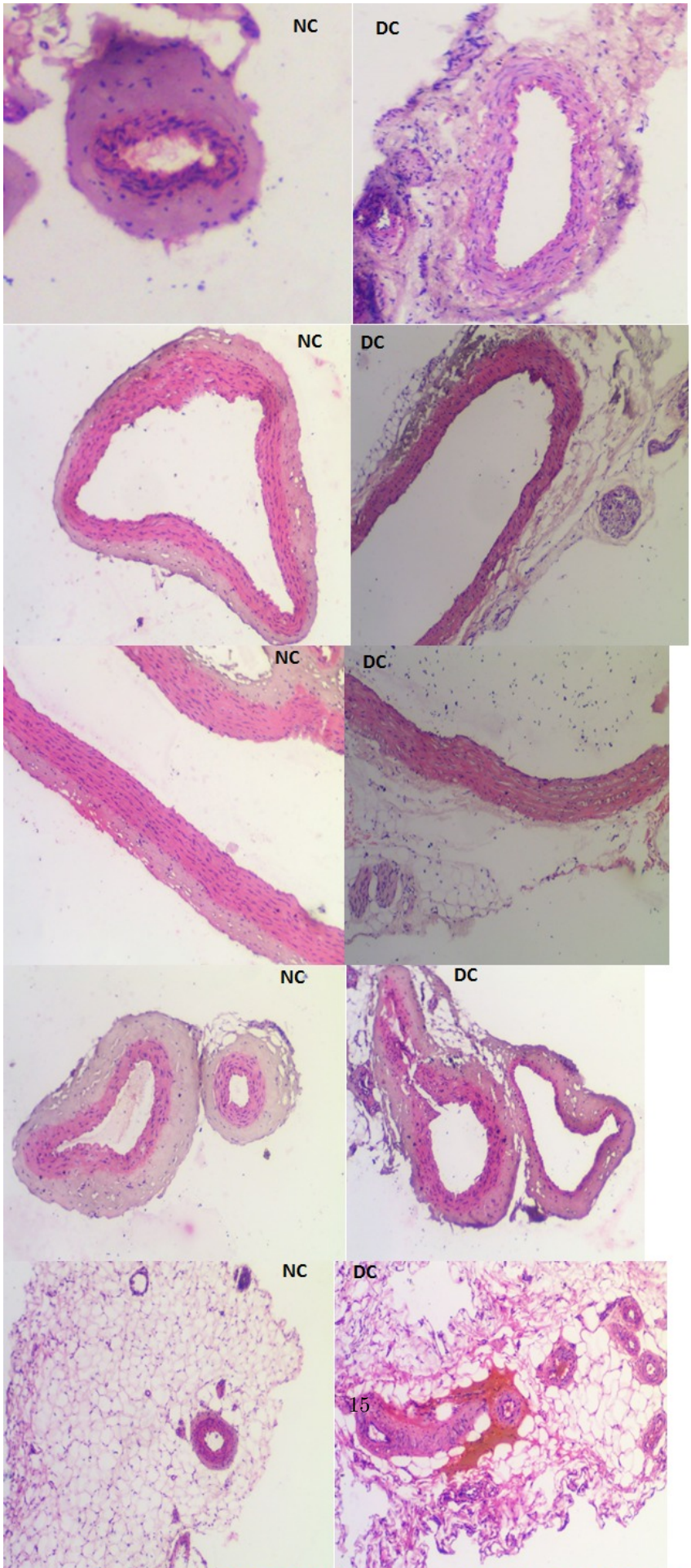
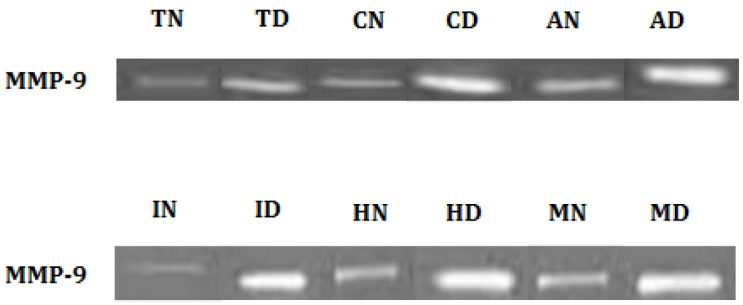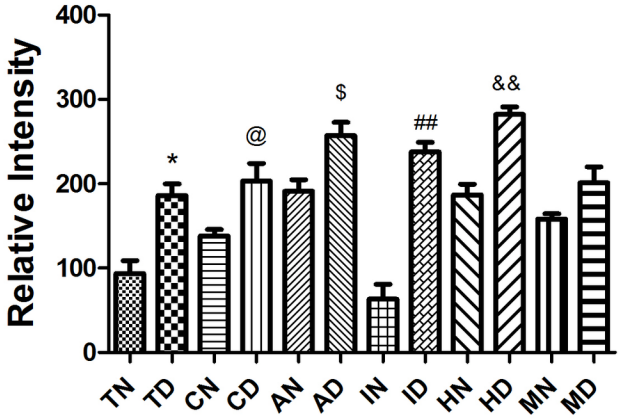
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