Structural and inflammatory changes in the myocardium of a porcine model of metabolic syndrome and HFpEF

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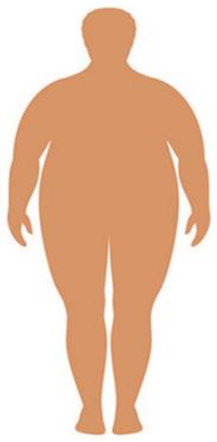
Metabolic syndrome

Combination of 3 or more of the following conditions:



Obesity

High glucose

Hypertension

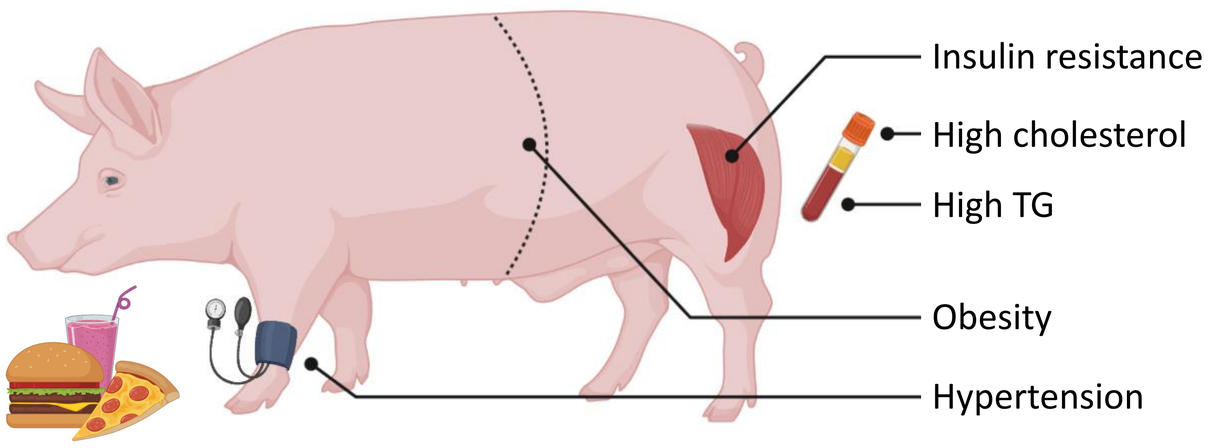
Low HDL-C

High TG

↗ CVD risk 10-fold

***HFpEF**, AF, atherosclerosis…*

Porcine model of MetS and HFpEF

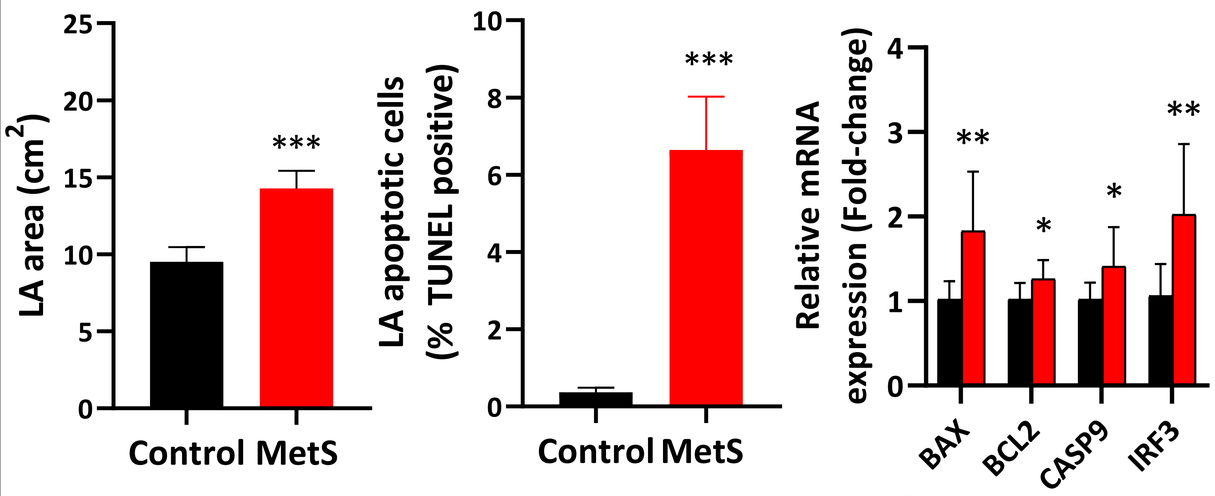


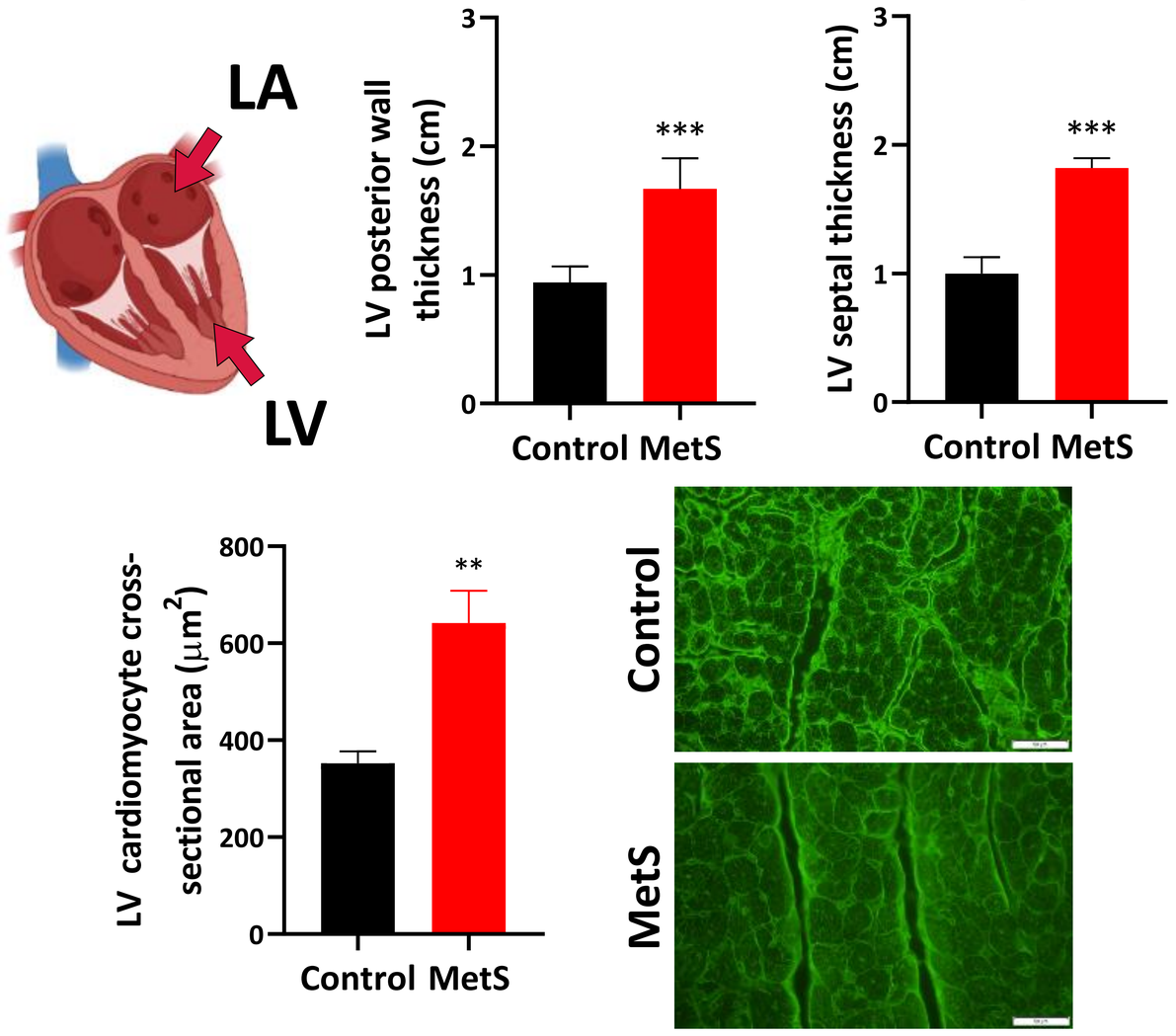
Western diet + steroid-induced hypertension for 12 weeks

→ MetS with multiple organ dysfunction

*Altered gut microbiota, intestinal permeability, systemic inflammation, NASH, **HFPEF***

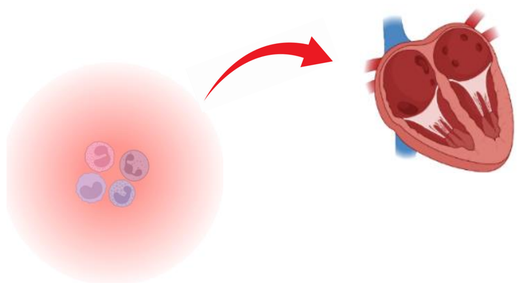
1. Cardiac structural and cellular alterations



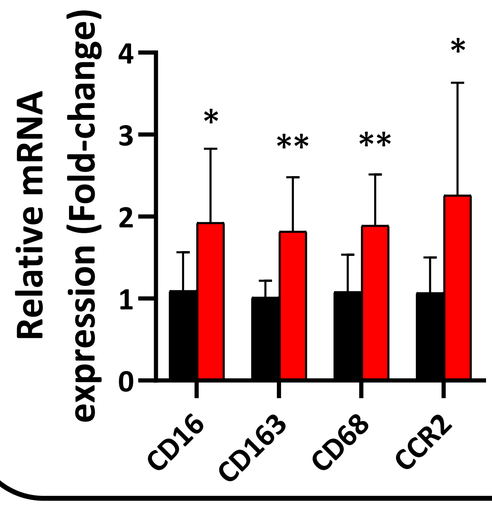


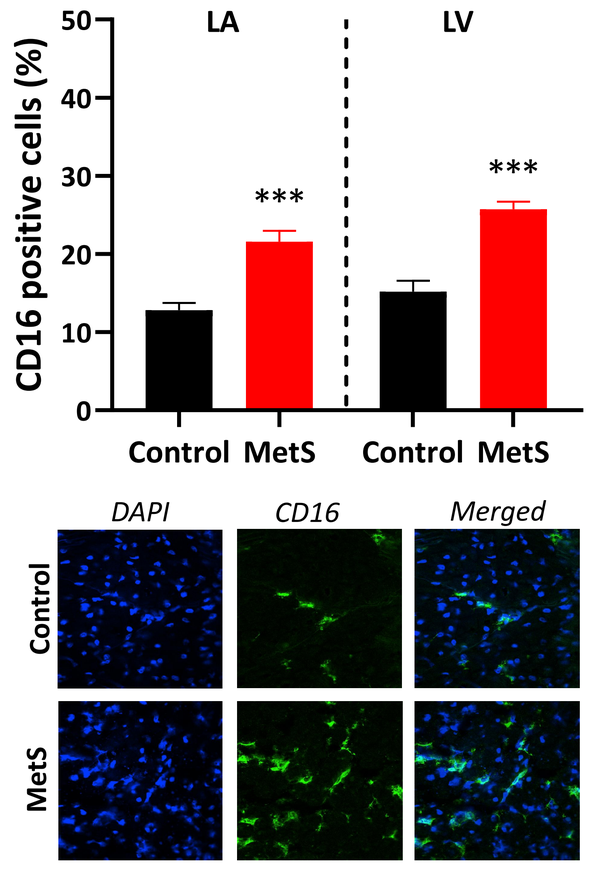
- *LA dilatation and apoptosis*
- *LV concentric hypertrophy*

2. Cardiac macrophage infiltration



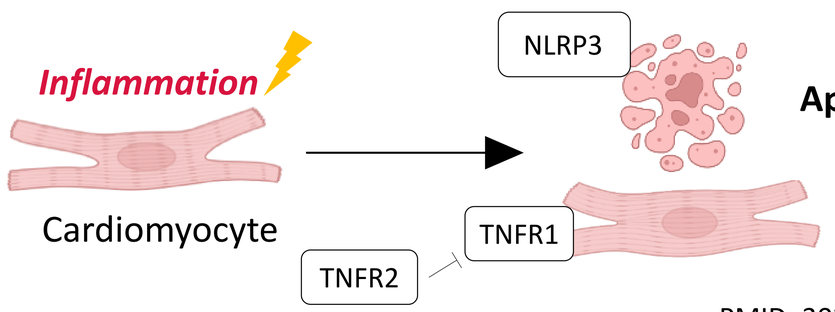
CD16⁺ macrophage





3. Inflammatory pathway activation

Proposed mechanism



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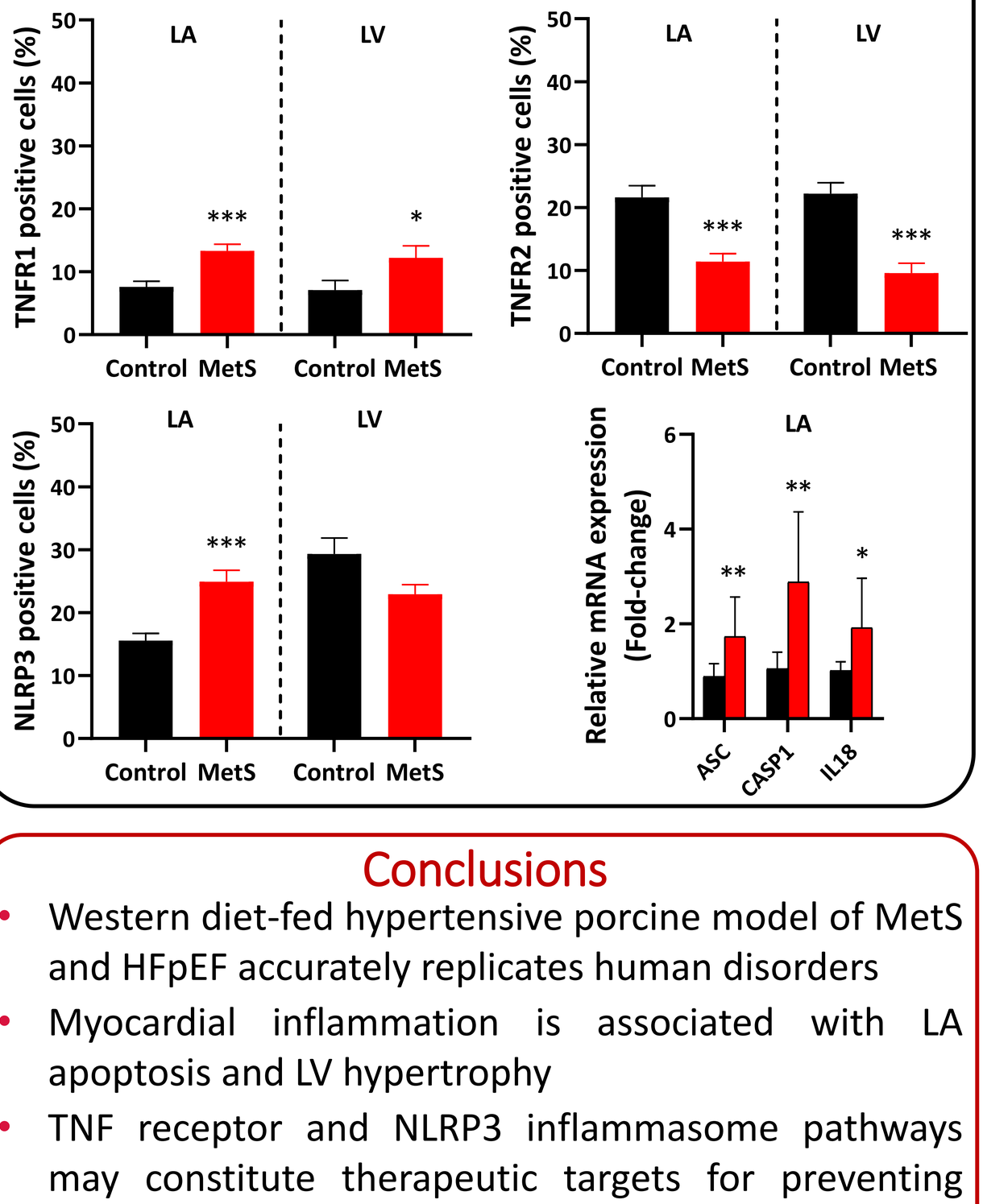

Conclusions

- Western diet-fed hypertensive porcine model of MetS and HFpEF accurately replicates human disorders
- Myocardial inflammation is associated with LA apoptosis and LV hypertrophy
- TNF receptor and NLRP3 inflammasome pathways may constitute therapeutic targets for preventing structural changes in the myocardium during MetS

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