



Egg Protein Derived Compounds Can Reduce Heart Diseases

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Heart diseases

Heart diseases or cardiovascular diseases are one of the leading cause of morbidity and mortality, worldwide. Inflammation or swelling in blood vessel or vascular inflammation is an auto immune disorder which is a primary cause of various other cardiovascular diseases such as **atherosclerosis**, **hypertension** etc.

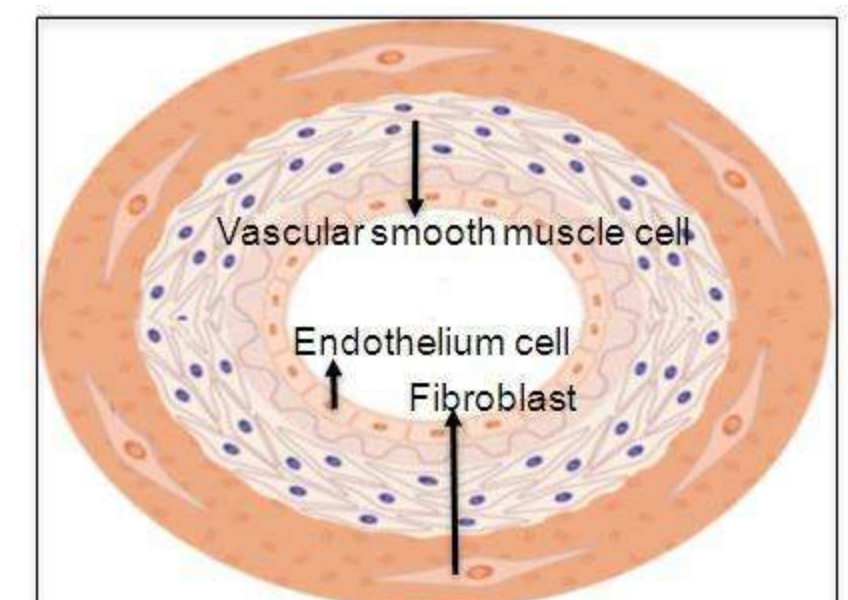
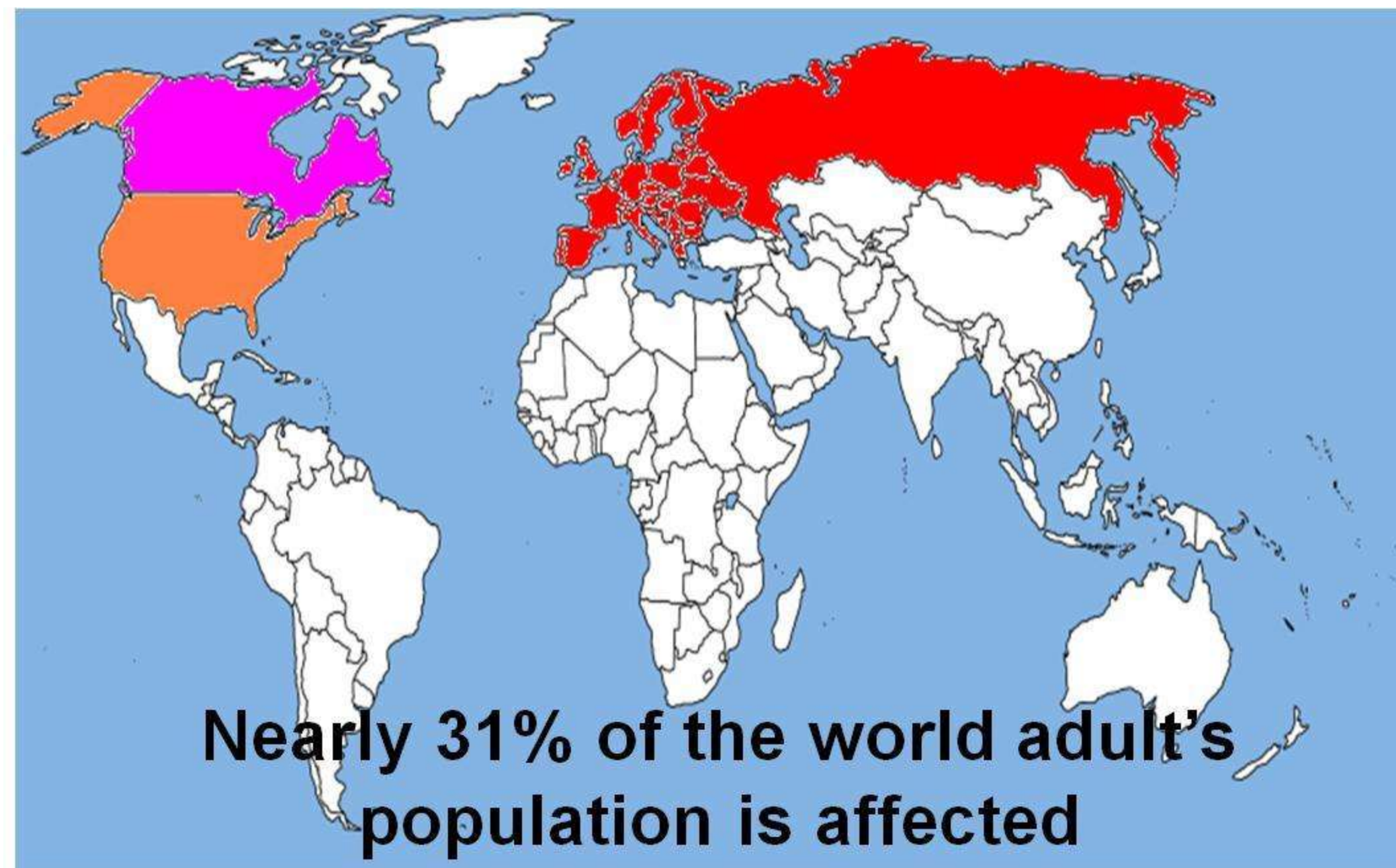


Fig 1: Cross sectional view of blood vessel.

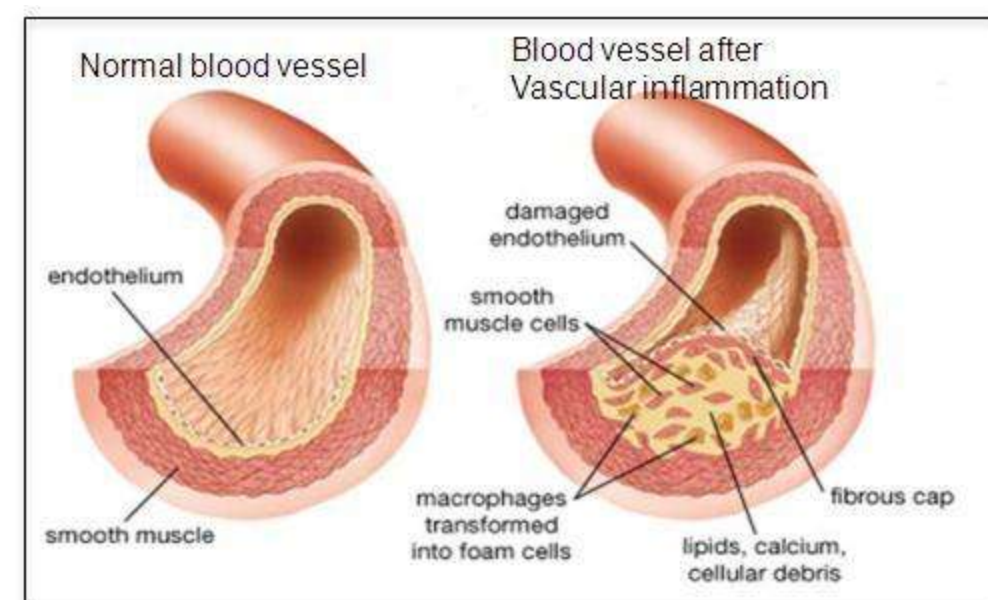
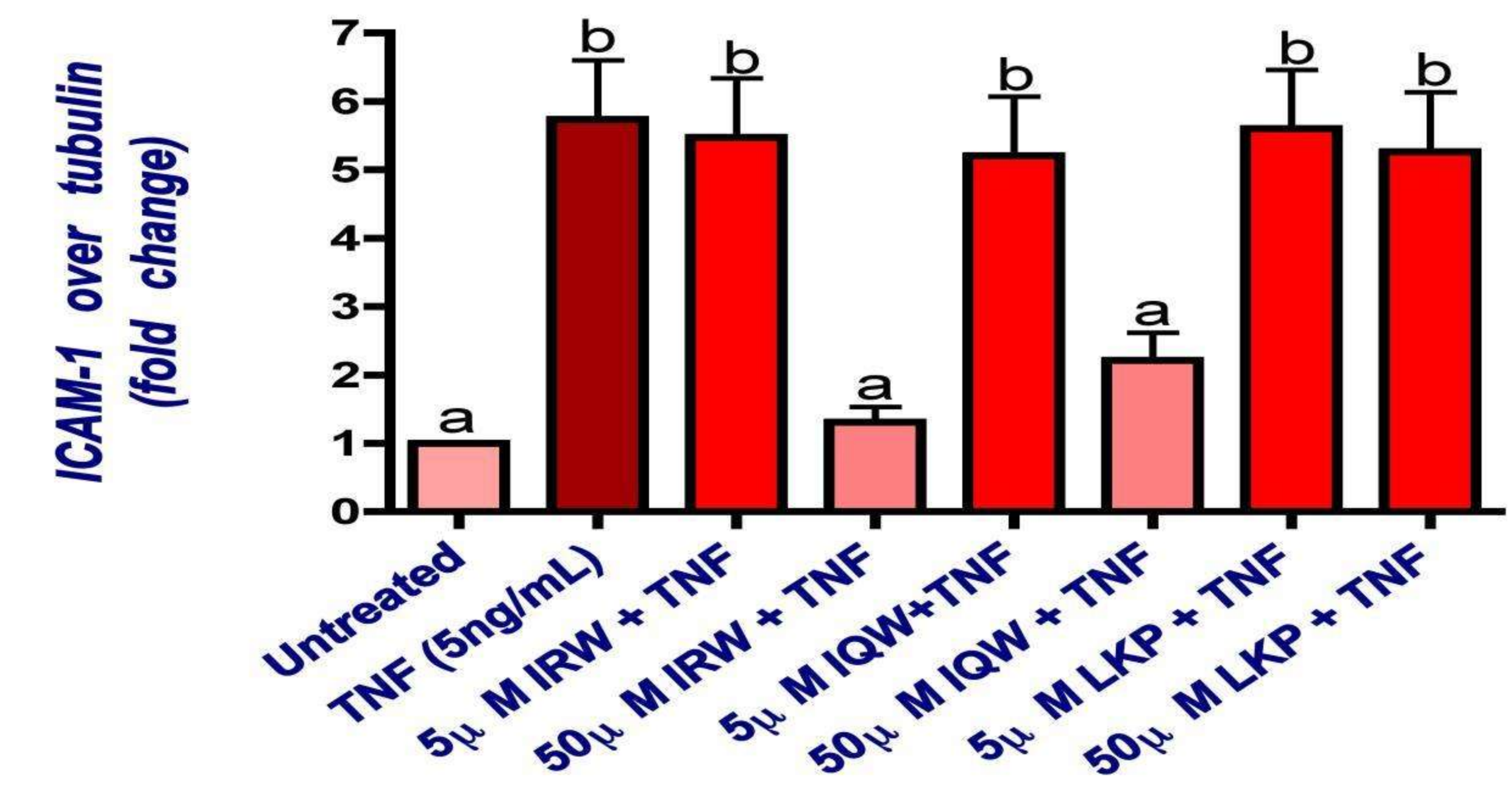


Fig 2: Physiology of human blood vessel at inflammatory condition. Encyclopedia Britannica 2007

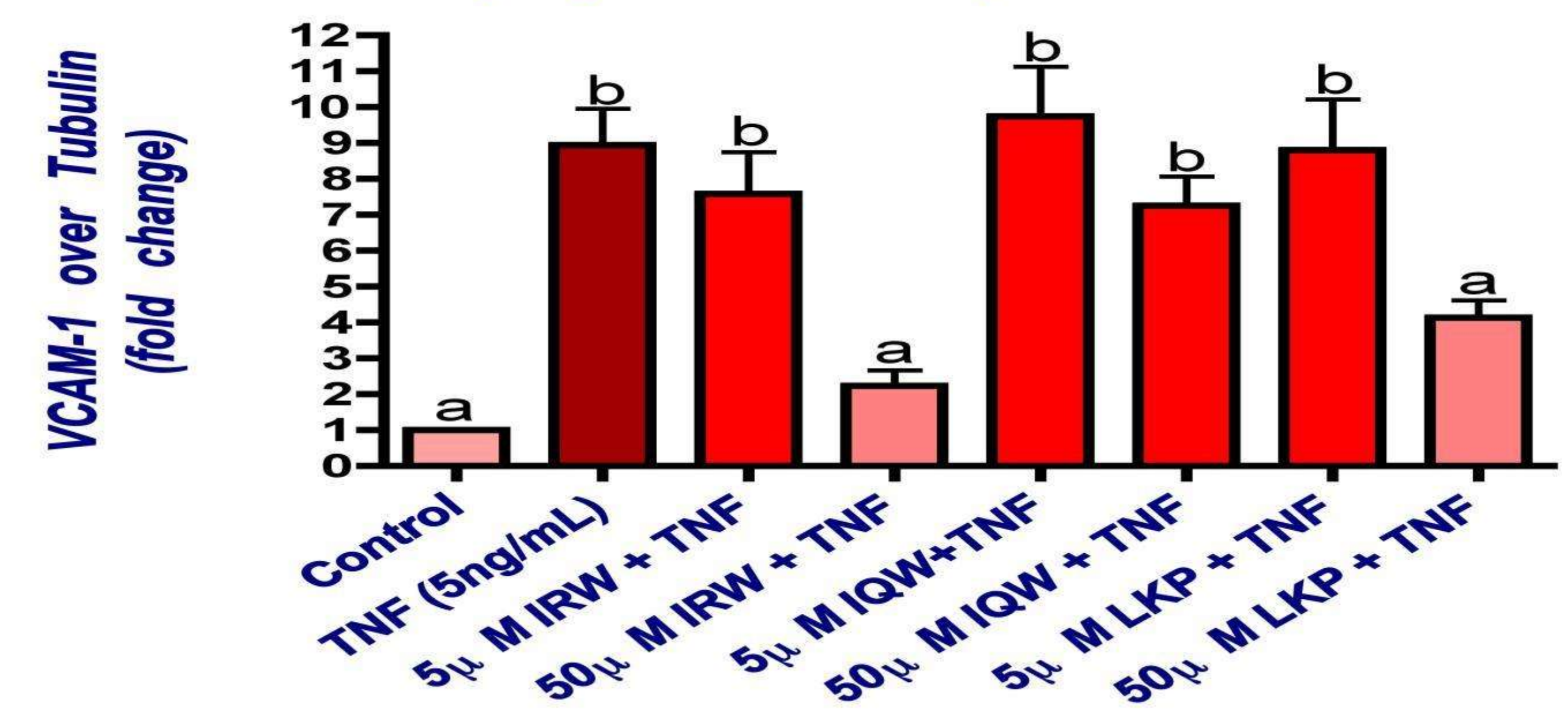
The inner most cellular layer of blood vessels are made of endothelium cells, which play a regulatory role in vascular inflammation. In a diseased condition damaged endothelium expressed two proteins on the cell surface, those are, **VCAM-1** and **ICAM-1**.

What we observed

All three peptides responses on ICAM-1 expression



All three peptides response on VCAM-1



Egg 'bioactive peptide'

We identified three potent short active fragment of protein or **bioactive peptides** (IRW, IQW and LKP) from **egg white protein ovotransferrin**. These peptides exhibited potent antiinflammatory activity.

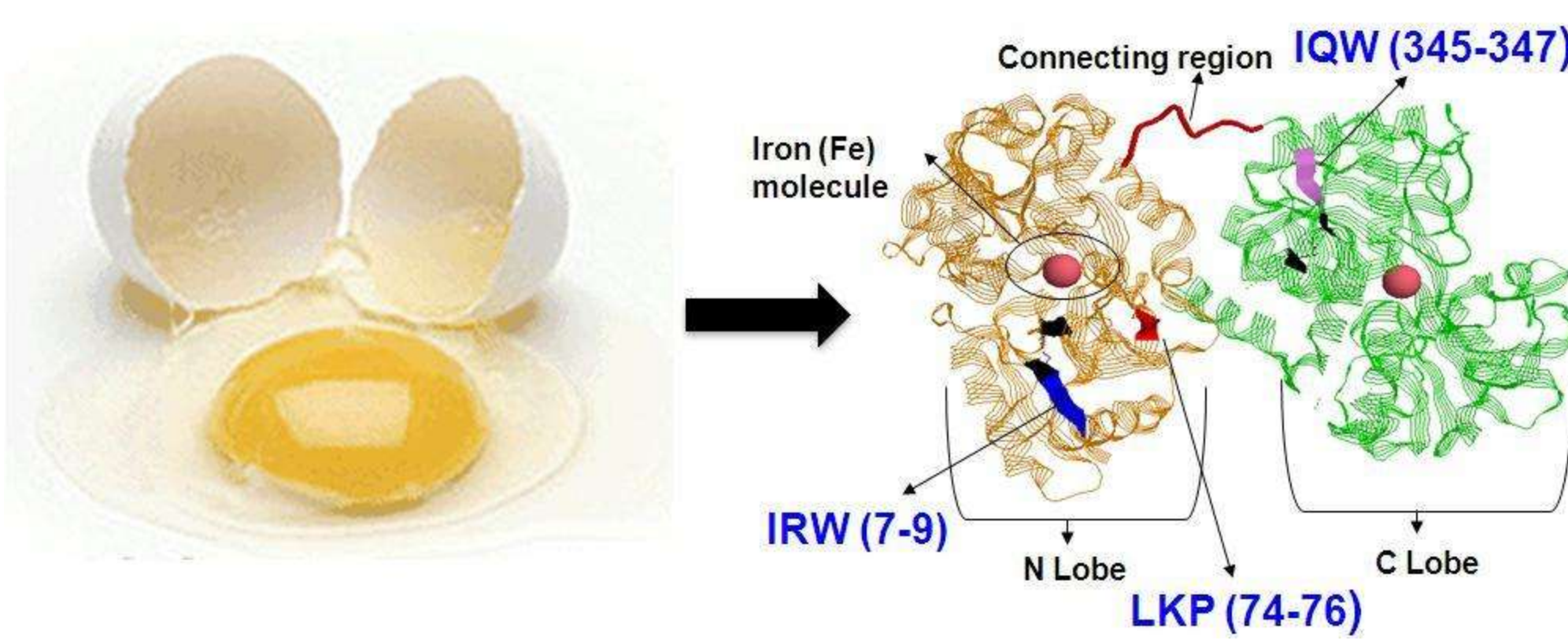


Fig 3: Molecular structure of egg white protein ovotransferrin and the bioactive peptides (IRW, IQW and LKP) are marked in the structure.

Our experimental design

- Human Umbilical Vein Endothelium Cells (HUVECs) were isolated from human umbilical chords and cultured on the lab condition. These cells were then pretreated by these three bioactive peptides (IRW, IQW and LKP) and then simulated by TNF.
- After simulation the expression of the ICAM-1 and VCAM-1 was checked by the western blot analysis.



Fig 4: Human Umbilical Vein Endothelium Cells (HUVECs) were isolated and cultured in the lab condition.

What we can say

- Egg protein ovotransferrin derived peptides (IRW, IQW and LKP) can reduce vascular inflammation.
- Though studies with the animal model (spontaneous hypertensive rats) will be helpful to investigate the ultimate efficacy of these peptides.
- These peptides can be used for the development of nutraceuticals which will open a new path for the egg industries.

Acknowledgement