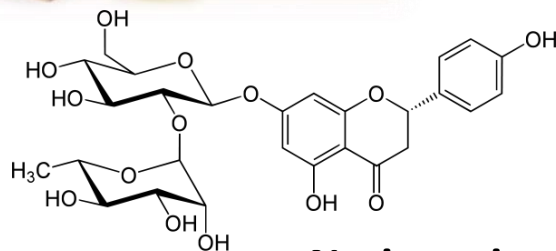


# Use of nutrigenomics to provide new insights in the molecular mechanisms involved in the effects of grapefruit polyphenols on vascular health in humans



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**Naringenin**  
(Flavanone)

- The consumption of citrus fruits is associated with CV health benefits.
- However clinical data regarding the effect of grapefruit flavanone consumption on vascular function are lacking.

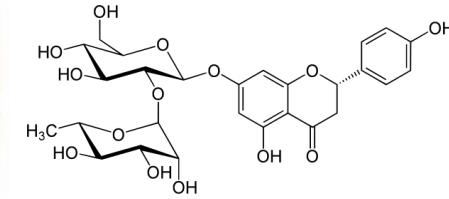
**The aim of this study was:**

- 1) To address the role of flavanones in the long-term effects induced by the consumption of grapefruit juice on vascular function**
- 2) To analyze change in PBMCs transcriptome profile (genes and miRNAs) induced by grapefruit flavanones.**

# A double-blinded, randomized, controlled cross-over study in healthy post-menopausal women (N=48)

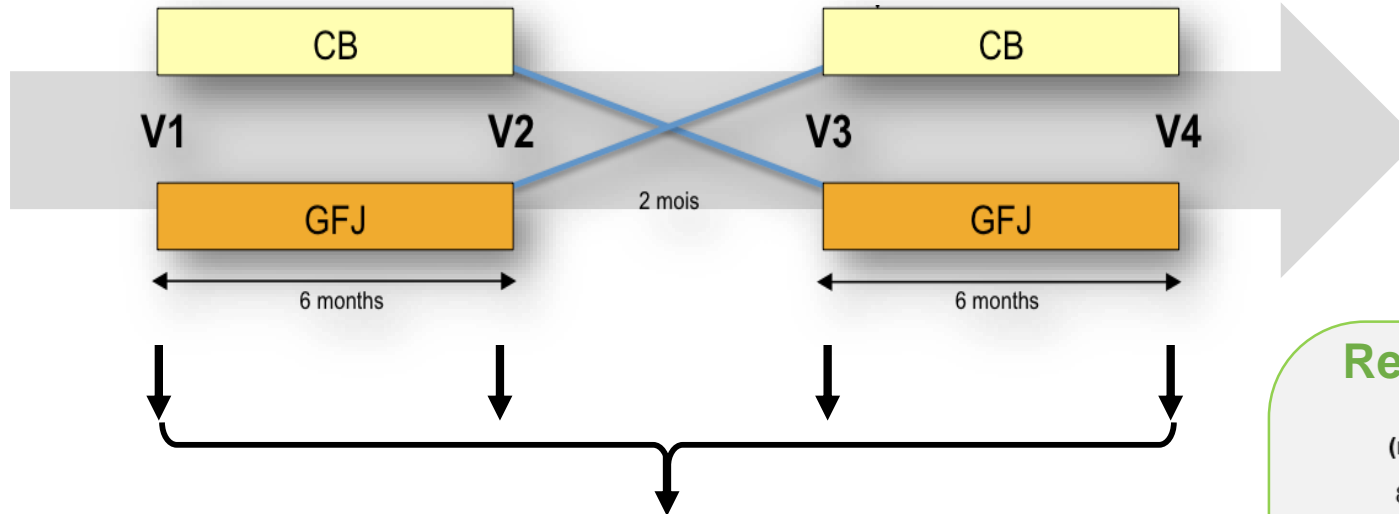
➤ 50-65 year-old

➤  $19 \leq \text{BMI} \leq 29.9 \text{ kg/m}^2$  and waist size  $> 88 \text{ cm}$



340 mL/d Control Beverage: **CB**  
(same composition as GFJ **but without NAR**)

340 mL/d GrapeFruit Juice: **GFJ**  
(providing 210 mg NAR)

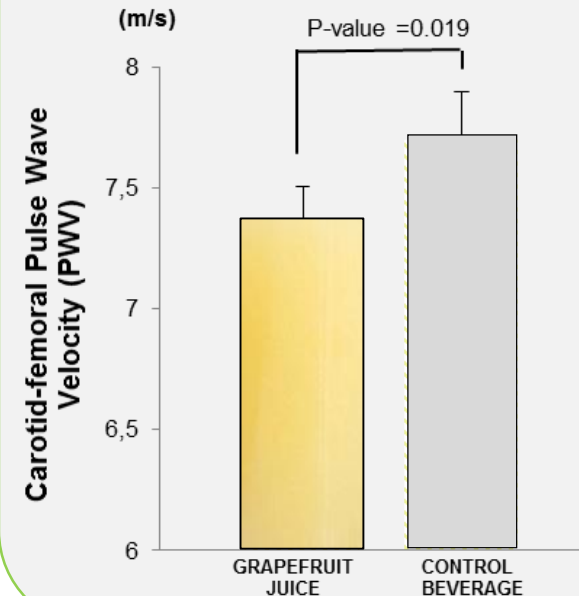


## PRIMARY OBJECTIVE :

To assess the role of flavanones in the effects of grapefruit juice consumption on vascular function

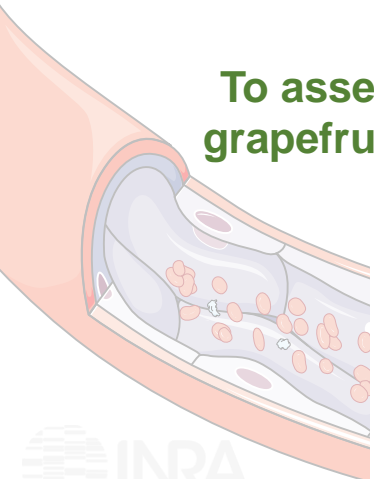
- Blood Pressure
- Endothelial Function  
(Flow-mediated dilatation)
- Arterial Stiffness  
(Carotid-Femoral Pulse Wave Velocity)

## Results



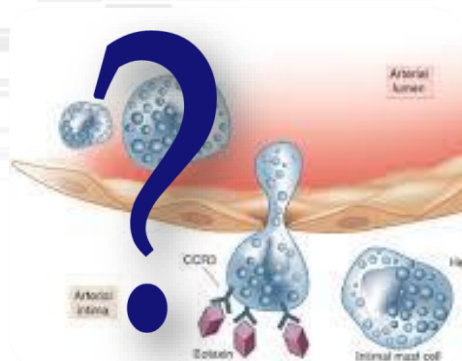
➤ GFP flavonones has no effects on blood pressure nor on endothelial function.

➤ The regular consumption of GFJ by post menopausal women is beneficial for arterial stiffness, this effect is related to grapefruit flavanones.



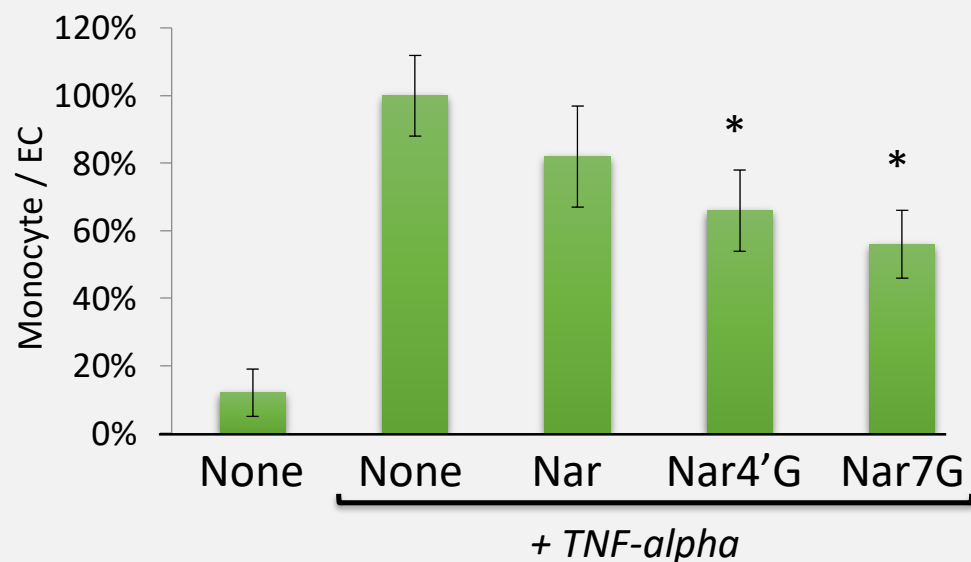


# Validation of our hypothesis



1. Exposure of monocytes to NAR metabolites

2. Adhesion assays to TNF- $\alpha$  stimulated endothelial cells



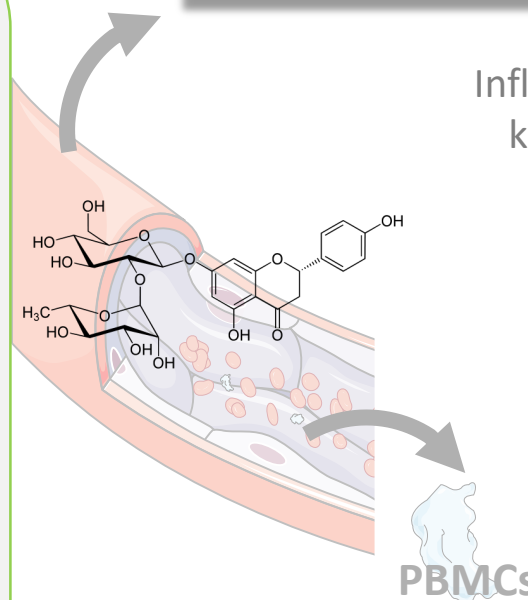
➤ Exposure of monocytes to plasma NAR metabolites reduced monocytes adhesion to activated endothelial cells



## THE TAKE-HOME MESSAGE

**Modulation of arterial stiffness by flavanones could be a potential way by which grapefruit consumption may exert over the long term beneficial effect on vascular health.**

Inflammation and immune cell infiltration are both known for their role in the induction of arterial stiffness (Makki-Petaja, 2009)



**Nutrigenomic study revealed that grapefruit flavanones may be effective in reducing the interactions between immune cells and vascular endothelium, as confirmed in cell experiments.**

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