

## **Does the bone hormone osteocalcin suppress inflammation within human aortic endothelial cells**

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**Introduction:** The bone hormone osteocalcin (OCN) has been recently connected to a number of extra-osseous functions, particular its undercarboxylated (ucOCN) form. Research into the effects of both ucOCN and the carboxylated (cOCN) form in the vasculature has resulted in a number of revelations including increased Akt phosphorylation and nitric oxide production in Human Aortic Endothelial Cells (HAoECs) and improved endothelial function in ApoE<sup>-/-</sup> mice when treated with OCN (1, 2). We hypothesised that OCN may therefore have a protective role in the vasculature and in atherosclerosis and may suppress inflammation.

**Methods:** HAoECs were grown until confluent in 24-well cell culture plates at passages  $\leq 6$ . Cells were treated with or without 10ng/ml of ucOCN or cOCN. A 24 hour inflammatory protocol was followed in which cells were treated with IFN- $\gamma$  and TNF- $\alpha$  (10ng/ml) or vehicle (n=8 for all conditions). Following the protocol cell media and lysates were collected appropriately. The inflammatory protocol was characterized by assessing phosphorylation status of VCAM-1, JNK, p38, IL-6 and IL-8.

**Results:** Treatment of HAoECs with ucOCN and cOCN did not affect any measured markers of inflammation, including the anti-inflammatory marker IL-10 (Figure 1).

**Conclusions:** Osteocalcin does not affect inflammation in HAoECs thus any potential protective role of OCN in atherosclerosis remains elusive. OCN may produce a different response in other vascular cells such as human aortic smooth muscle cells.

### **References:**

1. Jung CH, *et al.* (2013). *Metabolism* **62(9)**: 1250-7.
2. Dou J, *et al.* (2014). *Cardiovasc Diabetol* **13**: 74.

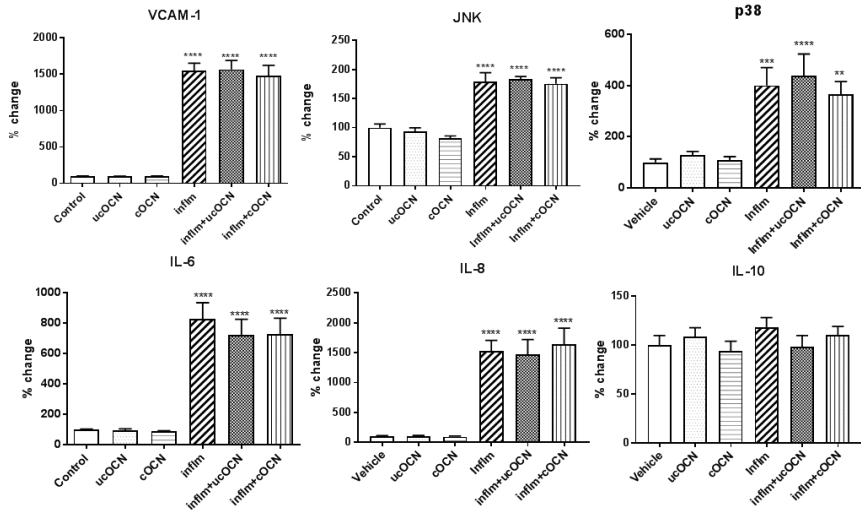


Figure 1. Mean % change of measured markers of inflammation relative to the control and standard error of the mean (SEM) following different treatment conditions. \* $p < 0.05$  \*\* $p < 0.01$  \*\*\* $p < 0.001$  \*\*\*\* $p < 0.0001$ . Abbreviations: ucOCN, undercarboxylated osteocalcin; cOCN carboxylated osteocalcin; inflm, inflammation.