

FREE FATTY ACIDS AND ENDOTHELIAL CELL FUNCTION

GREGORY D. VAN VICKLE

M. Harold Laughlin, Ph. D.

Thesis Supervisor

Marc Hamilton

Co-Advisor

ABSTRACT

The purpose of this thesis was to determine if specific components of oxidized low density lipoprotein (OxLDL) molecules e.g. oxidized polyunsaturated fatty acids (PUFAs), or saturated free fatty acids (FFA) are alone sufficient to decrease endothelial nitric oxide synthase (eNOS) protein content in endothelial cells. This hypothesis was tested by incubating porcine aortic endothelial cells (PAECs) with various oxidized PUFAs and saturated FFAs.

Twenty hour exposure of PAECs with the oxidized PUFAs (0-100 μ M) linoleic acid, eicosapentaenoic acid, and arachidonic acid, does not alter eNOS protein content. However, PAEC incubation with the saturated FFAs (0-.6mM) palmitic and stearic acid, which do not undergo oxidative modification, dose dependently decrease eNOS content.

The results of this study indicate that oxidized PUFAs are not sufficient alone to contribute to NO mediated endothelial dysfunction induced by OxLDL. However, saturated FFA may contribute to NO mediated endothelial dysfunction by decreased eNOS protein content within endothelial cells.