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THE EFFECT OF CD137-CD137 LIGAND INTERACTION ON THE EXPRESSION OF NFATC1 IN APOLIPOPROTEIN E-DEFICIENT MICE

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Haibing Yang Yanjinchuan, Liangjie Xu, Wei Yuan, Jie Gong, Cuiping Wang, A Yanjinchuan. *The Affiliated Hospital of Jiangsu University*

Objectives Increasing evidence shows that the interaction of CD137-CD137L plays an important role in atherosclerosis. However, the mechanism of CD137-CD137L interaction contribution towards pathogenesis has been poorly understood. The aim of this study was to investigate the effect of CD137-CD137L interaction on the nuclear factor of activated T cells c1 (NFATc1) in ApoE$^{-/-}$ mice.

Methods Atherosclerotic plaque model was produced by rapid perivascular carotid collar placement in ApoE$^{-/-}$ mice. In vivo, the expression of NFATc1 in mice plaque and lymphocytes was detected by immunohistochemical, flow cytometry and Western blot, respectively. In vitro, the expression of NFATc1 mRNA and protein in cultured lymphocytes of ApoE$^{-/-}$ mice was measured by RT-PCR and flow cytometry, respectively. The level of IL-2, IL-6, TNF-α and IFN-γ was measured by RT-PCR.

Results We found that the expression of NFATc1 was significantly increased both in atherosclerotic lesion and in leukocytes from ApoE$^{-/-}$ mice. In vitro and vivo, after stimulating CD137-CD137L interaction, the expression level of NFATc1 mRNA and protein was significantly increased in lymphocytes, while anti-CD137L mAb significantly suppressed the expression of NFATc1 in leukocytes. Moreover substantially elevated levels of IL-2, IL-6, TNF-α and IFN-γ were induced by anti-CD137 mAb, while NFATc1 inhibitor markedly suppressed production of IL-2, IL-6, TNF-α and IFN-γ.

Conclusions This study suggested that CD137-CD137L interactions can regulate the expression of NFATc1 in ApoE$^{-/-}$ mice, which may play an important part in atherosclerotic plaque formation.

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