World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:12, No:02, 2018

Effects of Anti-FGL2 Monoclonal Antibody SPF89 on Vascular Inflammation

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Abstract : Fibrinogen-like protein 2 (FGL2) has recently been identified to play an important role in inflammatory diseases such as atherosclerosis through a thrombin-dependent manner. Here, a murine monoclonal antibody was raised against the critical residue Ser(89) of FGL2, and the effects of the anti-FGL2 mAb (SPF89) were analyzed in human umbilical vein endothelial cells (HUVECs) and THP-1 cells. Firstly, it was proved that SPF89, which belongs to the IgG1 subtype with a KD value of 44.5 pM, could specifically show the expression levels of protein FGL2 in different cell lines of known target gene status. The lipopolysaccharide (LPS)-mediated endothelial cell proliferation was significantly inhibited with a decline of phosphorylation nuclear factor-κB (NF-κB) in a dose-dependent manner after SPF89 treatment. Furthermore, SPF89 reduced LPS-induced expression of adhesion molecules and inflammatory cytokines such as vascular cell adhesion molecule-1, tumor necrosis factor-α, Matrix metalloproteinase MMP-2, Integrin αvβ3, and interleukin-6 in HUVECs. In macrophage-like THP-1 cells, SPF89 effectively inhibited LPS and low-density lipoprotein-induced foam cell formation. However, these anti-inflammatory and anti-atherosclerotic effects of anti-FGL2 mAb in HUVECs and THP-1 cells were significantly reduced after treatment with an NF-κB inhibitor PDTC. All the above suggest, by efficiently inhibiting LPS-induced pro-inflammatory effects in vascular endothelial cells by attenuating NF-κB dependent pathway, the new anti-FGL2 mAb SPF89 could to be a potential therapeutic candidate for protecting the vascular endothelium against inflammatory diseases such as atherosclerosis. This work was supported by the Program of Sichuan Science and Technology Department (2017FZ0069) and Collaborative Innovation Program of Sichuan for Elderly Care and Health(YLZBZ1511).

Keywords : monoclonal antibody, fibrinogen like protein 2, inflammation, endothelial cells
Conference Title : ICI 2018 : International Conference on Immunology
Conference Location : London, United Kingdom
Conference Dates : February 15-16, 2018