Role of the tenascin-C-derived peptide TNIII-A2 in the atherosclerotic form cell formation.

Exceeded expression of tenascin-C (TNC) was frequently observed at the inflammatory site, including atherosclerotic lesion. It is well known that the inflammatory responses are basically regulated by innate immune cells, such as macrophages. However, effect of TNC on the regulation of macrophage functions has not been well described.

Previously, we found that the 22-mer bioactive peptide derived from tenascin-C, termed TNIIIA2, have ability to promote β1 integrin activation. We also reported that the TNIIIA2 region is cryptic and exposed by inflammatory proteinase-mediated limited proteolysis of TNC. Therefore, in this study, we investigated the role of TNIIIA2-macrophage interaction to the progression of inflammation-related diseases.

When mouse macrophage cell line Raw 264.7 was stimulated with peptide TNIIIA2, phagocytic activity was significantly enhanced whereas there were no changes in the expression level of inflammatory mediators. On the other hand, in this experimental condition, expression of lipid transporter, ABCA1 and ABCG1, was significantly suppressed by TNIIIA2 addition. We also confirmed that the number of cells with intracellular lipid accumulation was significantly increased when TNIIIA2 was added to Raw cells simultaneously with ox-LDL. These results suggest that the TNIIIA2 might contribute to the progression of atherosclerosis through the promotion of foam cell formation.

Key words: tenascin-C, atherosclerosis, macrophage