

Anti-Phosphorylcholine T Cell Dependent Antibody

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Abstract : The human immune system plays an essential role in cardiovascular disease (CVD) and atherosclerosis. Our earlier studies showed that major immunocompetent cells including T cells are activated by phosphorylcholine epitope. Further, we have determined for the first time in a clinical cohort that antibodies against phosphorylcholine (anti-PC) are negatively and independently associated with the development of atherosclerosis and thus a low risk of cardiovascular diseases. It is still unknown whether activated T cells play a role in anti-PC production. Here we aim to clarify the role of T cells in anti-PC production. B cell alone, or with CD3 T, CD4 T or with CD8 T cells were cultured in polystyrene plates to examine anti-PC IgM production. In addition to mixed B cell with CD3 T cell culture, B cells with CD3 T cells were also cultured in transwell co-culture plates. Further, B cells alone and mixed B cell with CD3 T cell cultures with or without anti-HLA 2 antibody were cultured for 6 days. Anti-PC IgM was detected by ELISA in independent experiments. More than 8 fold higher levels of anti-PC IgM were detected by ELISA in mixed B cell with CD3 T cell cultures in comparison to B cells alone. After the co-culture of B and CD3 T cells in transwell plates, there were no increased antibody levels indicating that B and T cells need to interact to augment anti-PC IgM production. Furthermore, anti-PC IgM was abolished by anti-HLA 2 blocking antibody in mixed B and CD3 T cells culture. In addition, the lack of increased anti-PC IgM in mixed B with CD8 T cells culture and the increased levels of anti-PC in mixed B with CD4 T cells culture support the role of helper T cell for the anti-PC IgM production. Atherosclerosis is a major cause of cardiovascular diseases, but anti-PC IgM is a protection marker for atherosclerosis development. Understanding the mechanism involved in the anti-PC IgM regulation could play an important role in strategies to raise anti-PC IgM. Studies suggest that anti-PC is T-cell independent antibody, but our study shows the major role of T cell in anti-PC IgM production. Activation of helper T cells by immunization could be a possible mechanism for raising anti-PC levels.

Keywords : anti-PC, atherosclerosis, cardiovascular diseases, phosphorylcholine

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