

In vitro and in vivo studies of retinoic acid effect on mouse T cells

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Abstract

Vitamin A has a strong impact inside the immune system, as vitamin A deficiency is able to modify the immune response against infection, neutrophils function, and T cells numbers. Retinoic acid (RA) is one of vitamin A active compounds, and it is effective in peripheral conversion of mature CD4 T cells into regulatory T cells (Tregs) by TGF- β . RA produced by dendritic cells in the gut, or exogenously given, is able to increase numbers of CD4⁺ Foxp3⁺ T cells. Tregs are critical to maintain immune regulation and prevention of autoimmune manifestations. Inside the thymus, where T cells are primarily generated, there is evidence that epithelial cells produce enzymes capable of convert retinol into RA. Since there is RA modulation in the periphery, we decided to test the role of retinoic acid in T cells development inside the thymus. To accomplish this goal, *in vitro* and *in vivo* studies were performed in mice, in two different time-points: 20h and 40h. In addition, anti-CD3 depletion effect on T cells was study in coordination with RA action. *In vitro* thymocytes cultures, *in vivo* treatments on B6 and B10.PL mice, and intravital imaging of thymus were performed during this project. The results show that RA had much thymic influence after 40h of treatment, causing DP depletion. Moreover, RA seems to not interfere with anti-CD3 effect on DP depletion. All together, this results show that RA is potentially a modulator on thymic T cell development. However, more studies are needed to complement and to comprehend the acquired data. Understanding the connections between nutrition and immunology can be essential to know how to modulate immune response and to attempt new therapeutical and safe strategies towards disease.

Key words:

Vitamin A, retinoic acid, T cells, thymus, regulatory T cells, anti-CD3