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Poster Sessions

Analysis of immune cells using redox-state monitoring mice

Naomi Kamimura¹, Kiyomi Nishimaki¹, Takashi Yokota¹, Yoshiko Iwai¹

¹*Gradu. Sch. Med., Nippon Med. Sch.*

Reactive oxygen species (ROS) is produced in immune cells during immune responses and is necessary for host defense and inflammation. Furthermore, ROS acts as signals for gene expression and required for T cell proliferation and activation. While low levels of ROS play important roles in cell activation, high levels of ROS induce significant damage to cells. To monitor redox state in living cells we generated transgenic mice expressing a green fluorescent protein (roGFP) whose fluorescence varies with redox state (J Invest Dermatol. 34, 1701-1709, 2014). CRO mice, measuring the redox state of whole cells and MRO mice, measuring the redox state of mitochondria were generated. Immune cells were isolated from CRO and MRO mice, and treated with hydrogen peroxide (oxidized state) or DTT (reduced state) to evaluate the maximum oxidation and reduction value in immune cells. Next, splenocytes isolated from CRO and MRO mice were stained with cell surface markers, and the redox state in various types of immune cells was analyzed by flow cytometry. We found that T cells were more oxidized than B cells in both CRO and MRO. This system should be a powerful and convenient tool for analyzing redox state in various types of immune cells.