LyzM-Cre-mT/mG mice for the study of immune microenvironments

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Abstract

The immune system is a defense system comprising many biological structures and processes within an organism that protects against disease. Phagocytosis is an important feature of cellular immunity performed by cells called phagocytes that engulf, or eat, pathogens or particles. Phagocytes generally cruising the body searching for pathogens, but it can be called to specific location by cytokines. The interaction between immune cell and cancer plays a critical role in anti-tumor research. Therefore, building an observing model is required.

The B6.129P2-Lyz2$^{tm1(cre)Ifo}$/J strain (LysM-Cre) which is a knock-in allele which has a nuclear-localized Cre recombinase inserted into the first coding ATG of the lysozyme 2 gene (Lyz2) [1]. And Gt (ROSA)26Sor$^{tm4(ACTB-tdTomato,\ -EGFP)\ Luo}$/J strain (mTmG) prior to Cre recombination, cell membrane-localized tdTomato (mT) fluorescence expression is widespread in cells/tissues. Cre recombinase expressing cells have cell membrane-localized EGFP (mG) fluorescence expression replacing the red fluorescence [2]. We use these two mouse strains building a model platform to observe tumor-macrophage interaction before and in the course of immune therapy. EGFP expression driven by lysozyme promotor. Therefore, the myeloid cells like neutrophils and monocytes can thus be labelled with EGFP. By using multi-photon confocal microscopy, we can observe the myeloid cells (green fluorescence) with 960nm wavelength laser excitation and other cells (red fluorescence) with 1100nm wavelength laser excitation (Figure 1). This mice model can help us to get deeper understanding of the tumor-monocyte microenvironment.

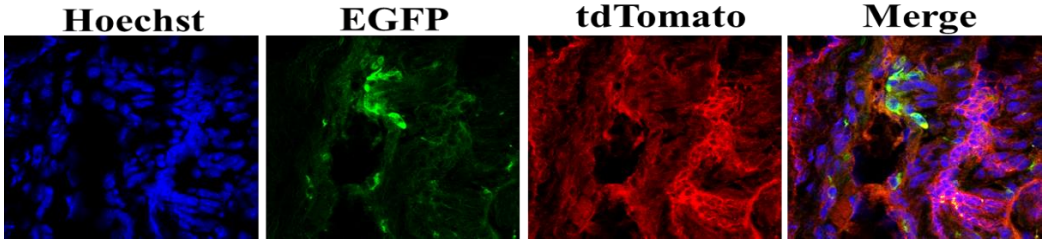

Figure 1: Mice heart tissue stained with Hoechst (blue fluorescence for cell nuclear)

Reference

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