B6-Il2rg-KO

Strain Name: C57BL/6JGpt-*Il2rg*^{em1Cd}/Gpt

Strain Type: Knock-out

Strain ID: T015768

Background: C57BL/6JGpt

Description

Interleukin 2 receptor gamma chain (Il2rg, CD132) is a subunit of the common receptors of cytokines IL2, IL-4, IL-7, IL-9, IL-15 and IL-21. These cytokines are involved in regulating the differentiation, development and maturation of lymphocytes, as well as various immunological functions such as T cell sensitization and the formation of autoimmune tolerance. The Il2rg gene is located on the X chromosome in mammals, and mutations in this gene can lead to human X chromosome-linked severe combined immunodeficiency (XSCID) and other diseases [1-3].

Exon2 of Il2rg gene were knock out by gene editing technology to obtain B6-Il2rg-KO strain mice, which lack mature T cells and B cells, and lack functional NK cells. The strain can be used for immunology, inflammation and self-immunology research and gene therapy research of human XSCID.

Strategy

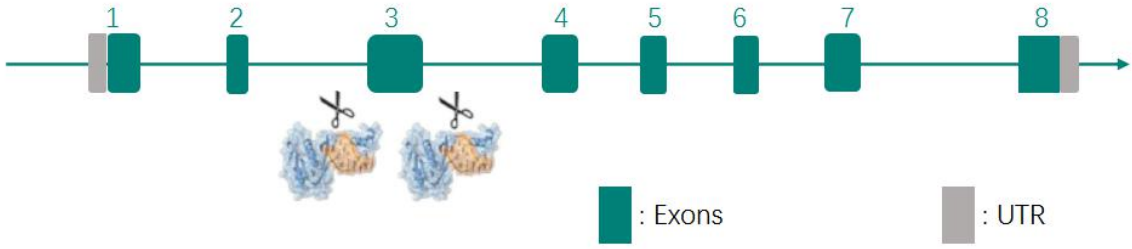


Fig.1 Schematic diagram of Il2rg knock out strategy in B6-Il2rg-KO mice.

Application

1. Immunology and autoimmunity research;
2. Inflammation research;
3. Growth factor or cytokine receptor research;
4. Gene therapy research for human XSCID.

Data support

1. The T/B/NK cell ratio detection

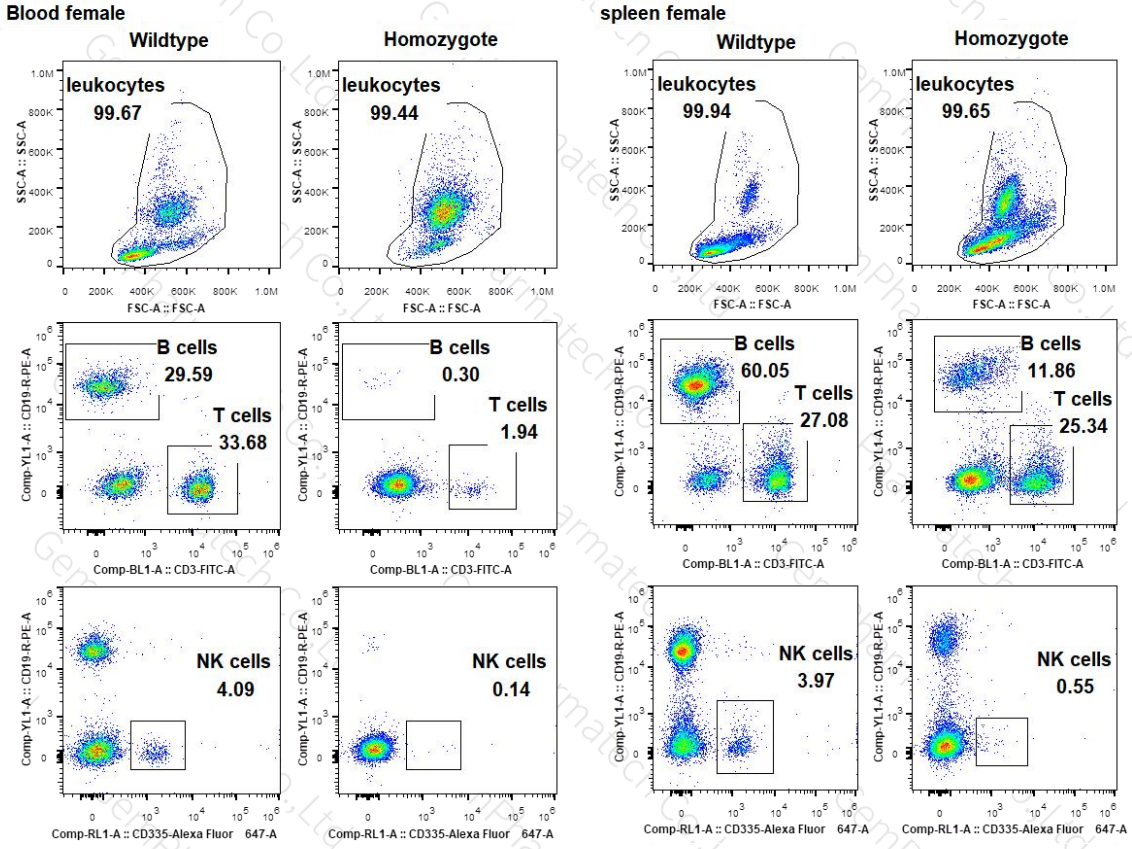
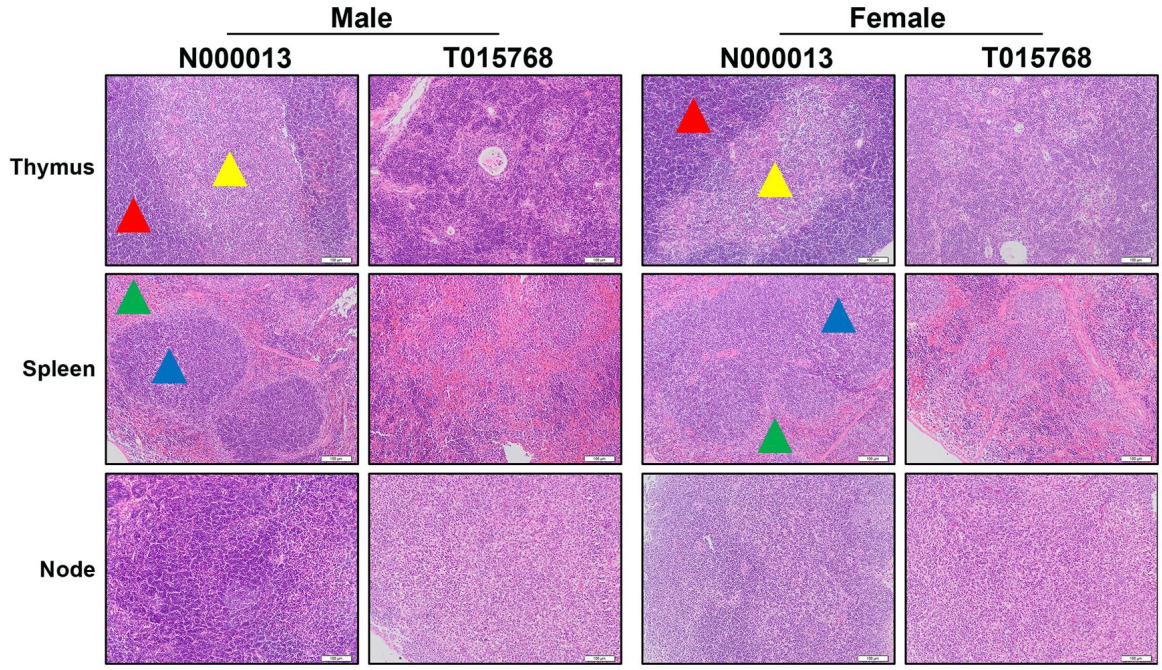


Fig.2 Detect the proportion of T/B/NK cells in B6-Il2rg-KO mice.

Compared with wild type, the proportion of total T, B and NK cells in B6-Il2rg-KO homozygous mice were significantly reduced in peripheral blood and spleen. The ratio of T cells to B cells are impaired, while functional NK cells is missing.

2. Tissue development of thymus, spleen and lymph nodes



Note: Cortical area (red triangle area), medulla area (yellow triangle area), white pulp (blue triangle area), red pulp (green triangle area). N000013(b6 mice), T015678(B6-Il2rg-KO mice).

Fig.3 Observation of the tissue development of thymus, spleen and lymph nodes in B6-Il2rg-KO mouse.

In the control mice, the boundary between the thymus and the medulla in thymus and the structure between white and red pulp in the spleen were clear, and there were no obvious abnormalities in the mesenteric lymph nodes. However, in B6-Il2rg-KO homozygous mice, the thymus tissue is underdeveloped, boundaries between cortex and medulla was unclear, meanwhile, the boundaries between white and red pulp was unclear in the spleen accompanied with increases number of splenic trabeculae. Lymphocytes in mesenteric lymph nodes were immature.

References

1. Cao X, Shores EW, Hu-Li J, et al. Defective lymphoid development in mice lacking expression of the common cytokine receptor gamma chain.Immunity. 1995 Mar;2(3):223-38.
2. Al-Shami A, Spolski R, Kelly J, et al. A role for thymic stromal lymphopoietin in CD4(+) T cell development. J Exp Med. 2004 Jul 19;200(2):159-68.
3. DiSanto, James P., et al. "Lymphoid development in mice with a targeted deletion of the interleukin 2 receptor gamma

chain." Proceedings of the National Academy of Sciences 92.2 (1995): 377-381.