Introduction of Humanized Mouse Models

In vivo studies of human immunodeficiency virus (HIV) infections, vaccine development and drug testing are technically and ethically difficult. Thus, mice that have a human immune system are valuable tools for this research.

The development of the non-obese diabetic (NOD)-scid mouse model achieved dramatic down regulation of natural killer cell (NK)-cell activity; thus, it is able to support a higher level and more sustainable engraftment of human immune system components. To further suppress or impede development of innate immunity, mouse models bearing truncation or total knockout of the interleukin-2 receptor γ-chain (Il2rg) in the (NOD)-scid background were established. Il2rg, also known as common cytokine-receptor γ-chain, is an indispensable component of various cytokine receptors. Strains such as NOD.Cg-Prkdcscidll2rgtm1Wji (NSG) and NODShi.Cg-Prkdcscidll2rgtm1Sug (NOG) present robust disruption of mouse cytokine signaling and complete ablation of NK-cell development, in addition to severe impairment of adaptive immunity.

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