CLAIMS

1. An immunodeficient mouse model of human humoral and cellular immunity, comprising a transgene encoding human interleukin-3 (IL-3), a transgene encoding human granulocyte/macrophage-colony stimulating factor 2 (GM-CSF), a transgene encoding human stem cell factor (SCF), and a transgene encoding human IL-15; and obtained by myeloablative treatment and engraftment of peripheral blood mononuclear cells (hPBMCs).
2. The mouse model of claim 1, obtained by myeloablative treatment comprising irradiation.
3. The mouse model of claim 2, obtained by irradiation comprising gamma irradiation (cGy).
4. The mouse model of claim 3, obtained by irradiation comprising is ≤ 150 cGy.
5. The mouse model of any one of the preceding claims, obtained by engraftment of fewer than $1x10^7$ of hPBMCs.
6. The mouse model of any one of the preceding claims, obtained by engraftment of hPBMCs within 3 days of the myeloablative treatment.
7. The mouse model of any one of the preceding claims, obtained by further engraftment of human diseased cells.
8. The mouse model of any one of the preceding claims, wherein the mouse is to be administered a human therapeutic or prophylactic agent.
9. The mouse model of claim 8, wherein the mouse is to be administered a human therapeutic agent within 30 days of the myeloablative treatment.
10. A method comprising assaying an isolated sample, optionally a blood sample, from the mouse model of any one of the preceding claims for one or more human cytokines.
11. The method of claim 10, wherein the one or more human cytokines are selected from interferon gamma (IFN-γ), interleukin (IL)-2, IL-4, IL-6, IL-10, and tumor necrosis factor alpha (TNFα).
12. A method comprising assaying an isolated sample, optionally an isolated blood sample, from the mouse model of any one of the preceding claims for one or more human immunoglobulins.
13. The method of claim 12, wherein the one or more human immunoglobulins are

selected from IgM, IgA, IgG, optionally IgG1, IgG2, IgG3, and IgG4.

14. A method comprising assaying an isolated sample, optionally an isolated blood sample, from the mouse model of any one of the preceding claims for one or more anti-drug antibodies.

15. A mouse model of human humoral and cellular immunity of any one of claims 1-9, wherein the mouse model further comprises (a) human cytokines selected from interferon gamma (IFN-γ), interleukin (IL)-2, IL-4, IL-6, IL-10, and tumor necrosis factor alpha (TNFα) and/or (b) one or more human immunoglobulins.

16. An immunodeficient mouse comprising a transgene encoding human interleukin-3 (IL-3), a transgene encoding human granulocyte/macrophage-colony stimulating factor 2 (GM-CSF), a transgene encoding human stem cell factor (SCF), and a transgene encoding human IL-15.

17. The immunodeficient mouse of claim 16, wherein the immunodeficient mouse has a non-obese diabetic genetic background.

18. The immunodeficient mouse of claim 16 or 17, wherein the immunodeficient mouse has a severe combined immune deficiency mutation (*Prkdc*^{scid}) and a null allele of the IL2 receptor common gamma chain (*IL2rg*^{null}).