

C001070

Strain Datasheet



NOD-Scid Mouse

Product ID: C001070

Common Name: NOD-Scid

Strain Name: NOD.Cg-*Prkdc*^{scid}/Cya

Background: NOD.Cg

Coat Color: White

Strain Type: Spontaneous mutation

Strain Description

Non-Obese Diabetic (NOD) mice are an autoimmune type I diabetes model that spontaneously develops into non-obese Insulin-Dependent Diabetes Mellitus (IDDM). In addition to abnormal blood sugar in the metabolic system, NOD mice also have defects in innate immunity, such as the complement system and macrophage deficiency, and low NK cell activity. In addition, due to the high affinity of Signal regulatory protein α (SIRP α) to human CD47, NOD mice are more suitable for human cell-derived tumor xenografts than other strains.

NOD-Scid mice are constructed by knocking out the *Prkdc* gene of NOD mice, and the deletion of the *Prkdc* gene makes NOD-Scid mice further lack T cells and B cells. NOD-Scid mice lack the adaptive immune system, no longer develop autoimmune diabetes, and also show the characteristics of natural immune deficiency of NOD mice, which are very suitable for allogeneic and xenotransplantation.

Application Area

- ① Allografts and Xenografts research: Assessment of tumor cell proliferation, invasion and metastatic potential and efficacy of anticancer therapies;
- ② Diabetes and Obesity research: Type I Diabetes;
- ③ Hematology research: Leukemia;
- ④ Tumor Immunology and Inflammation research.

Validation Data

1. Detection of B, T, and NK cells in peripheral blood (PB)

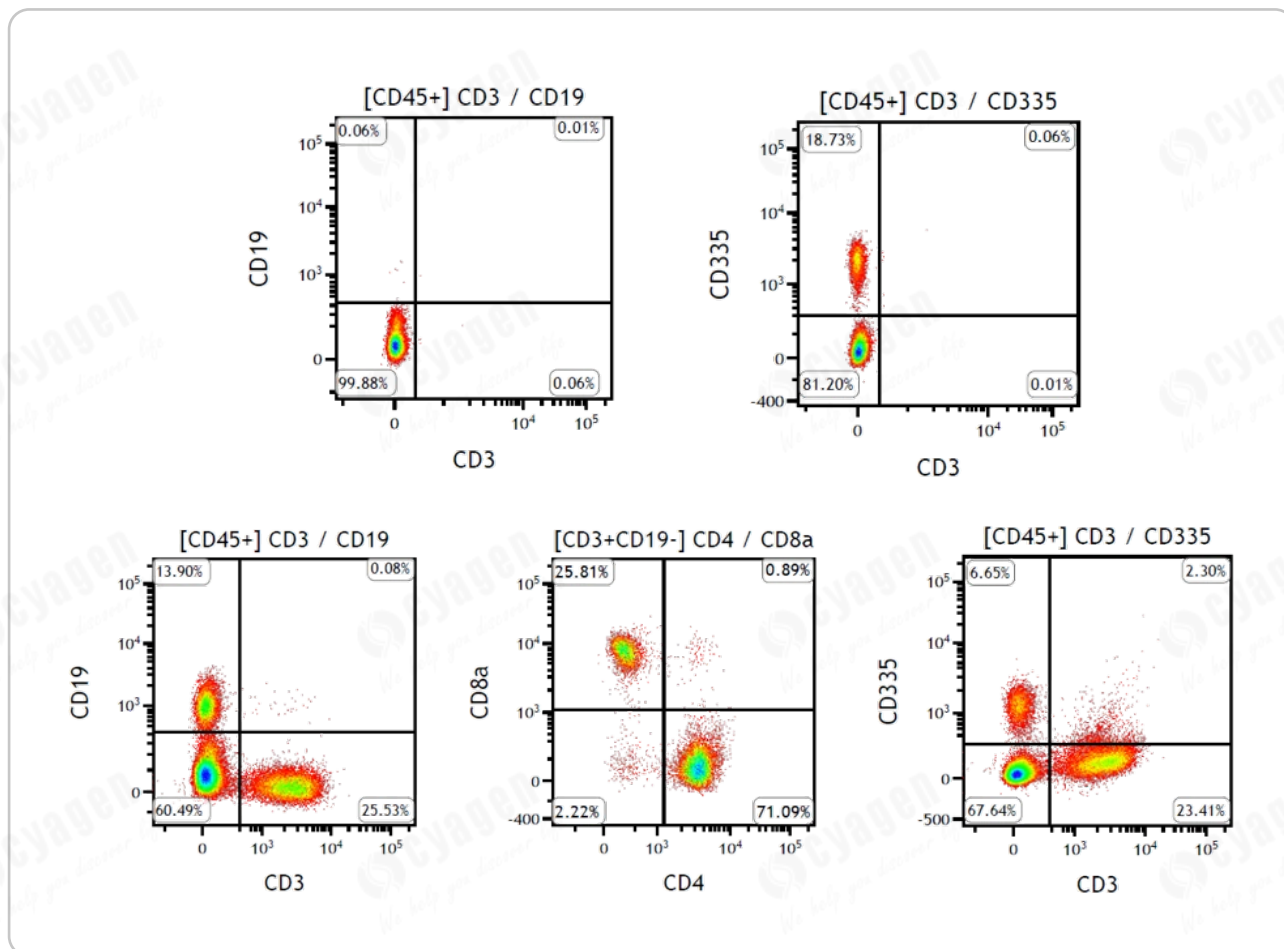


Figure 1. Analysis of T, B, and NK cells in the peripheral blood (PB) of NOD-Scid mice (top) and BALB/c mice (bottom). The peripheral blood (PB) of NOD-Scid mice and BALB/c mice was collected, respectively, and the composition of T, B, and NK cells was analyzed by immunophenotyping using flow cytometry. The results showed that B cells (CD3-CD19+) and T cells (CD3+CD19-) in the peripheral blood (PB) of NOD-Scid mice (top) were almost completely absent compared with BALB/c mice (bottom).

2. Detection of B, T, and NK cells in the spleen

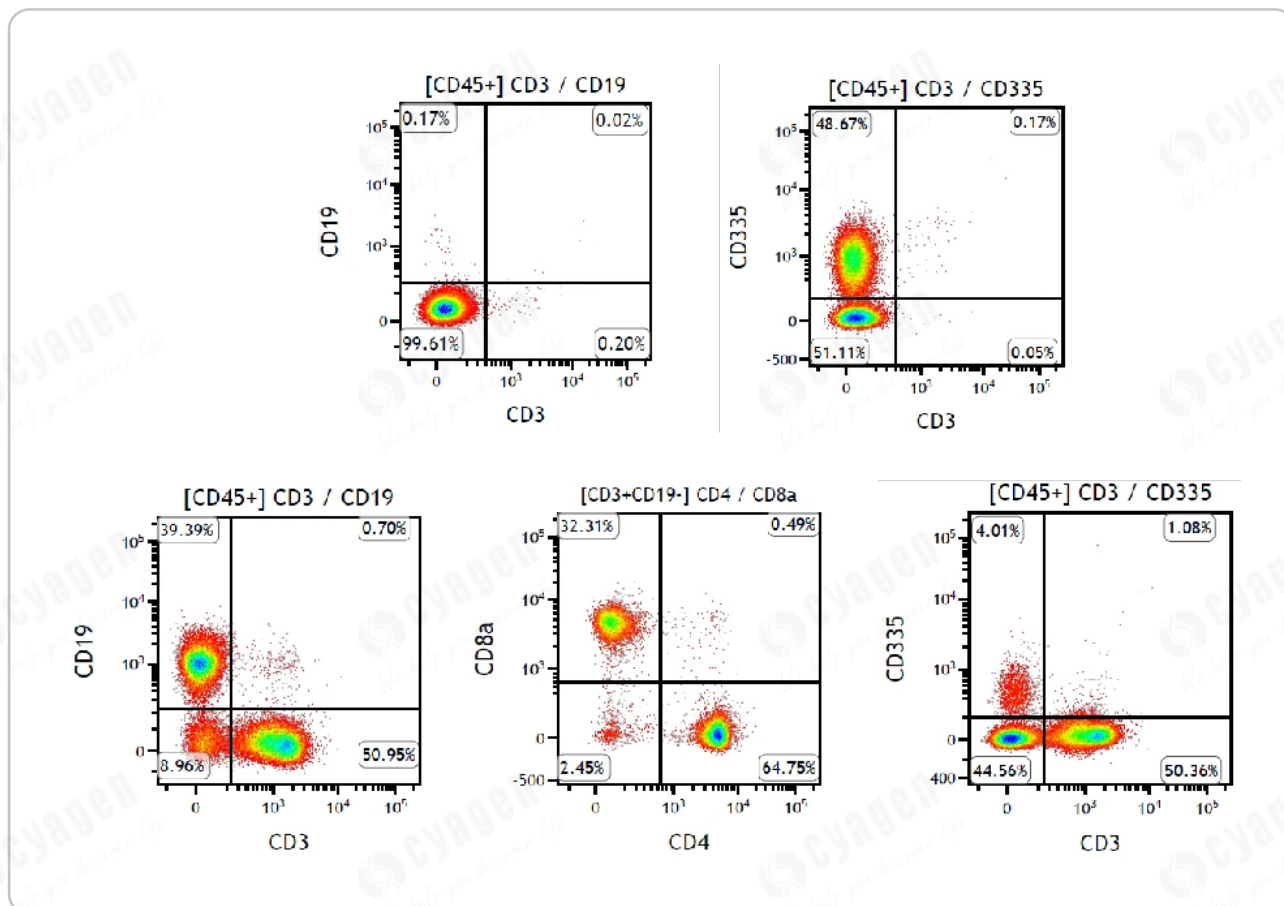


Figure 2. Analysis of T, B, and NK cells in the spleen of NOD-Scid mice (top) and BALB/c mice (bottom). The spleens of NOD-Scid mice and BALB/c mice were collected, respectively, and the composition of T, B, and NK cells was analyzed by immunophenotyping using flow cytometry. The results showed that B cells (CD3-CD19+) and T cells (CD3+CD19-) in the spleen of NOD-Scid mice (top) were almost completely absent compared with BALB/c mice (bottom).

3. Generation of Cell Line-Derived Tumor Xenograft (CDX) model

(1) Human hepatoma cells (HepG2)

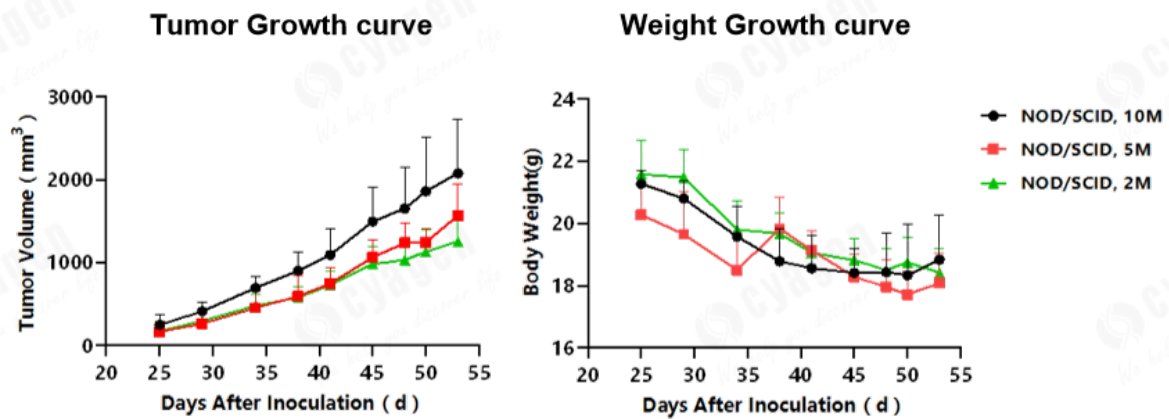


Figure 3. Human hepatoma cells HepG2 can be used to establish an effective tumor model in NOD-Scid mice. Hepatoma cells HepG2 were inoculated subcutaneously into NOD-Scid or BALB/c nude mice, and the tumor volume and mouse body weight were measured at different time points. Data are presented as Mean±SEM.

(2) Human lung cancer cells (A549)

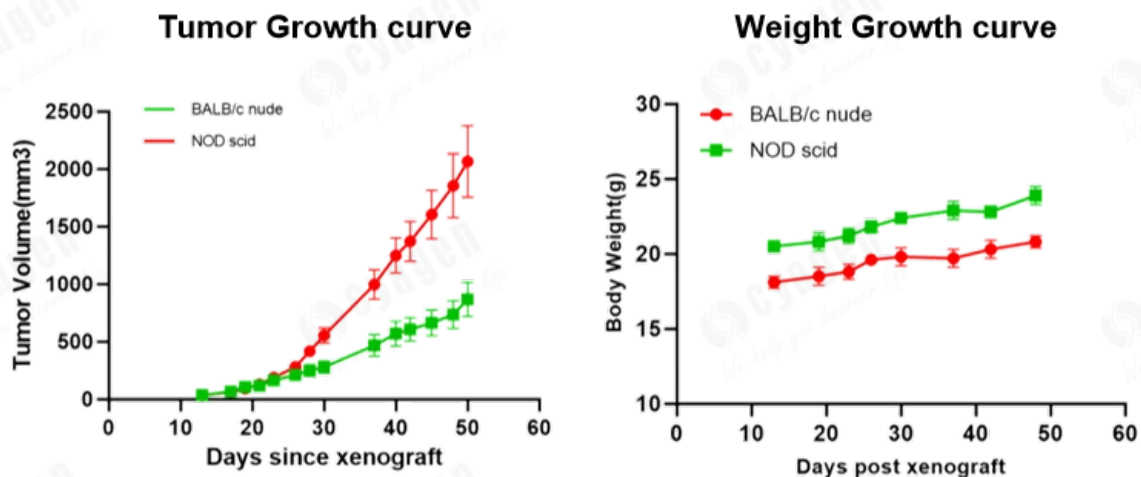


Figure 4. Compared with BALB/c nude mice, human lung cancer cells A549 can be used to establish effective tumor models in NOD-Scid mice. Human lung cancer cells A549 were inoculated

subcutaneously into NOD-Scid or BALB/c nude mice, and the tumor volume and mouse body weight were measured at different time points. Data are presented as Mean $\pm$ SEM.

4. Growth curve

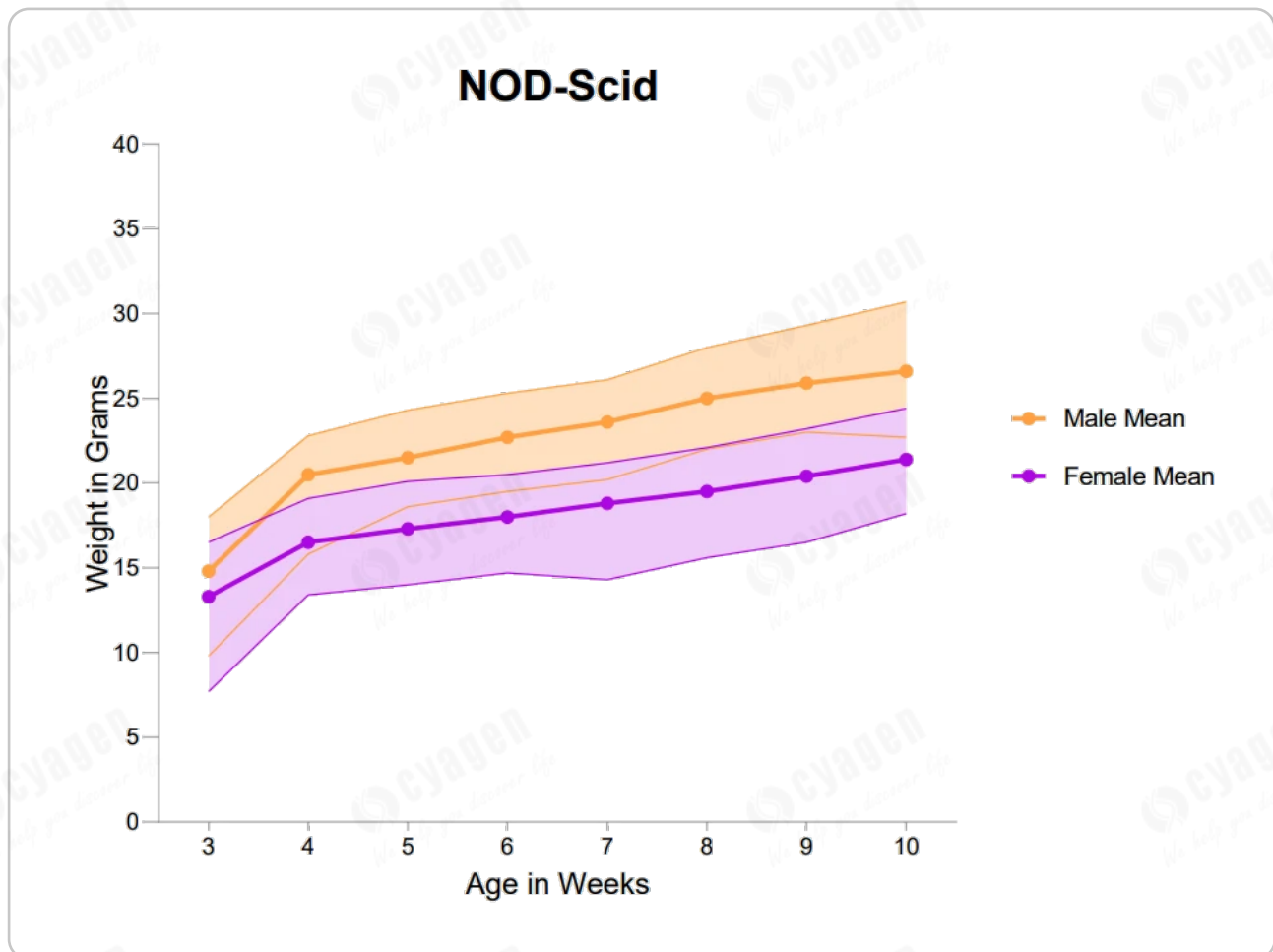


Figure 5. Body weight curves of NOD-Scid mice at different ages. Body weight analysis was performed on 3 to 10-week-old NOD-Scid mice. The results showed that the body weight of NOD-Scid male mice (yellow curve) was generally higher than that of female mice (purple curve).

5. H&E staining

(1) H&E staining of various tissues of NOD-Scid mice

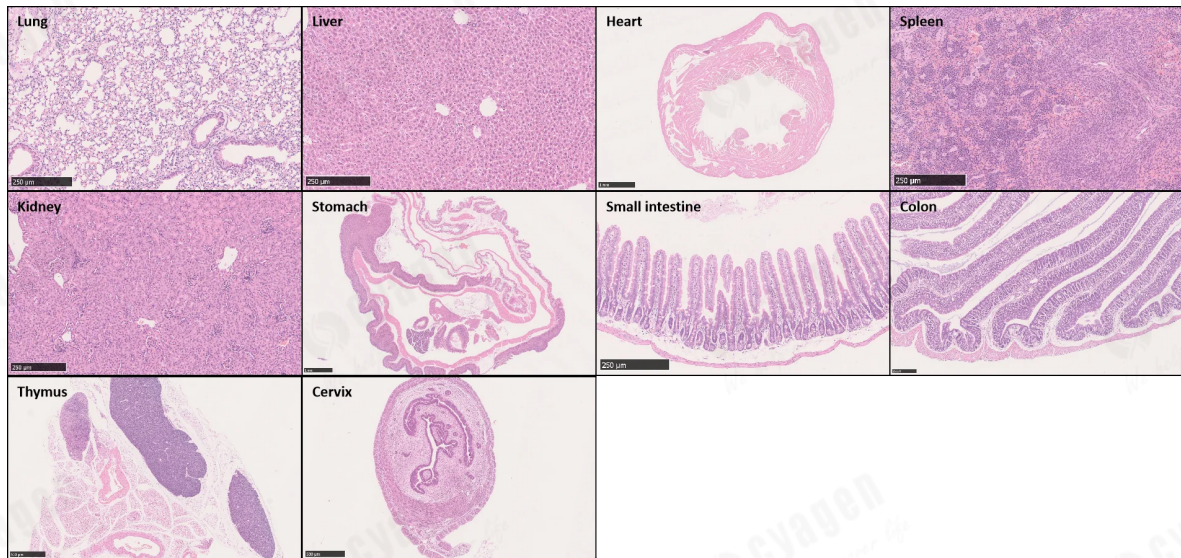


Figure 6. Pathological examination of NOD-Scid mice. No obvious abnormalities were observed in the lung, liver, heart, kidney, stomach, small intestine, colon, or cervix. However, the spleen lacked white pulp, and lymphocytes were reduced in the spleen and thymus.

(2) H&E staining results of spleen and thymus tissues

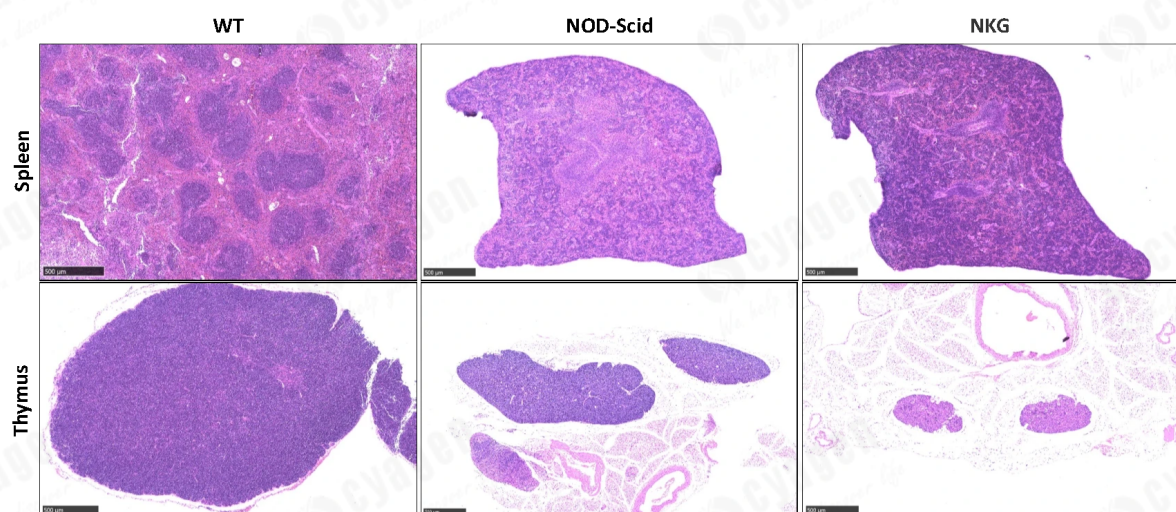


Figure 7. Pathological examination of spleen and thymus tissues in wild-type (WT) mice, NOD-Scid mice, and NKG mice. Results show that the spleen structure of wild-type mice is normal, with intact follicles and a normal red-to-white pulp ratio. In contrast, NOD-Scid and NKG mice exhibit a decreased number of lymphocytes and unclear red and white pulp boundaries in the spleen. Additionally, the thymus structure of wild-type mice is normal, whereas the thymuses of NOD-Scid and NKG mice are atrophied, with significantly reduced cortical and medullary lymphocytes.

6. Complete Blood Count (CBC) of 8-week-old NOD-Scid mice (n=20, data presented as Mean±SEM)

	WBC (10 ⁹ /L)	NEU (10 ⁹ /L)	LYM (10 ⁹ /L)	MON (10 ⁹ /L)	EOS (10 ⁹ /L)	BAS (10 ⁹ /L)	RBC (10 ¹² /L)	HGB (g/L)	HCT (%)	MCV (fL)	MCH (pg)	MCHC (g/L)	RDW-SD (fL)	RDW-CV (%)	PLT (10 ⁹ /L)	MPV (fL)	PCT (%)	PDW (%)
NOD-Scid (♀)	1±0.04	0.61±0.03	0.16±0.02	0.13±0.01	0.1±0.01	0±0	9.15±0.06	149.3±0.85	43.29±0.25	47.34±0.18	16.32±0.05	344.95±0.79	14.68±0.11	31.05±0.28	1344.35±30.81	4.96±0.03	15.66±0.03	0.67±0.01
NOD-Scid (♂)	1.59±0.08	0.95±0.05	0.28±0.03	0.26±0.03	0.09±0.01	0±0	9.86±0.01	159±1.56	46.25±0.51	46.9±0.14	16.13±0.05	343.75±0.8	14.12±0.06	29.67±0.16	1750.55±21.06	4.95±0.03	15.58±0.03	0.87±0.01

7. Blood biochemistry (n=8, data presented as Mean±SEM)

	TC(mmol/L)	TG(mmol/L)	HDL-C(mmol/L)	LDL-C(mmol/L)	ALT(U/L)	AST(U/L)	BUN(mmol/L)	Ca(mmol/L)	P(mmol/L)
NOD-Scid (♀)	3.43±0.04	0.81±0.07	1.4±0.04	0.25±0.01	44.76±2.41	164.86±11.67	8.66±0.26	2.44±0.04	2.95±0.12
NOD-Scid (♂)	4.24±0.1	1.43±0.16	2.54±0.15	0.26±0.02	50.28±5.34	163.54±14.79	8.19±0.23	2.79±0.04	2.87±0.13

8. In vivo tumorigenic validation of human-derived tumor cell lines

Cell lines	Source	Cancer	Cell types	Host mouse strains	In vivo
22Rv1	Human	Prostatic cancer	Wild-type	NKG; NOD-Scid	Subcutaneous
786-O	Human	Kidney cancer	Wild-type	NKG, NOD-Scid	Subcutaneous
A-375	Human	Malignant melanoma	Wild-type	NKG, BALB/c nude, NOD-Scid	Subcutaneous
A549	Human	Non-small cell lung cancer	Wild-type	NKG, NOD-Scid	Subcutaneous
AsPC-1	Human	Pancreatic cancer	Wild-type	NKG, BALB/c nude, NOD-Scid	Subcutaneous
BT-474	Human	Breast cancer	Wild-type	NKG, NOD-Scid	Subcutaneous
HCT-116	Human	Colorectal cancer	Wild-type	NKG, BALB/c nude, NOD-Scid	Subcutaneous
HeLa	Human	Cervical cancer	Wild-type	NKG, BALB/c nude, NOD-Scid	Subcutaneous
Hep G2	Human	Liver cancer	Wild-type	NKG, NOD-Scid	Subcutaneous
HuH-7	Human	Liver cancer	Wild-type	NKG, NOD-Scid	Subcutaneous
MDA-MB-231	Human	Breast cancer	Wild-type	NKG, NOD-Scid	Subcutaneous
NCI-H292	Human	Lung cancer	Wild-type	NKG, NOD-Scid	Subcutaneous
Raji	Human	Lymphomas	Wild-type	NKG, NOD-Scid	Subcutaneous
SK-OV-3	Human	Ovarian cancer	Wild-type	NKG, BALB/c nude, NOD-Scid	Subcutaneous
U-87 MG	Human	Malignant glioblastoma	Wild-type	NKG, NOD-Scid	Subcutaneous

***NKG mice (catalog number: C001316) are a kind of severe immunodeficient mice generated by Cyagen by deleting the *Il2rg* gene from NOD-Scid genetic background mice. NKG mice exhibit a deficiency of mature T cells, B cells, and functional NK cells, reduced complement activity, and weak phagocytosis of human-derived cells by macrophages.**

***BALB/c Nude mice (catalog number: C001217) are immunodeficient mice lacking mature T lymphocytes.**

***The specific validation data in this table can be found on the official website.**

Husbandry

- ① Recommended age for weaning: 3w;
- ② Recommended age for breeding: 6w;
- ③ Useful breeding life: No older than 28 weeks after birth;
- ④ Health Status: Specific pathogen-free (SPF);
- ⑤ Husbandry Notes: Short lifespan (8–9 months). To avoid the likelihood of mice exhibiting popcorn

behavior and escaping, please handle them gently as this strain is sensitive.

Strain Feature

- ① Introduce the Prkdcscid mutation based on the NOD mice;
- ② Congenital T and B lymphocyte immunodeficiency;
- ③ Decreased NK cell activity;
- ④ Decreased complement activity;
- ⑤ Decreased dendritic cell function;
- ⑥ The weak phagocytosis of macrophages on human cells.

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