

# Resource Summary Report

Generated by [NIF](#) on Aug 30, 2026

## NOD.Cg-Cd28<sup>tm1Mak</sup> Ifng<sup>tm1Ts</sup> H2<sup>h4</sup>/HbmMmmh

RRID:MMRRC\_037141-MU

Type: Organism

### Proper Citation

RRID:MMRRC\_037141-MU

### Organism Information

**URL:** [https://www.mmrrc.org/catalog/sds.php?mmrrc\\_id=37141](https://www.mmrrc.org/catalog/sds.php?mmrrc_id=37141)

**Proper Citation:** RRID:MMRRC\_037141-MU

**Description:** Mus musculus with name NOD.Cg-Cd28<sup>tm1Mak</sup> Ifng<sup>tm1Ts</sup> H2<sup>h4</sup>/HbmMmmh from MMRRC.

**Species:** Mus musculus

**Notes:** Research areas: Immunology and Inflammation; Mutation Type: Targeted Mutation ; Collection: Mullen

**Phenotype:** increased leukocyte cell number [MP:0000218]| increased monocyte cell number [MP:0000220]| extramedullary hematopoiesis [MP:0000240]| increased granulocyte number [MP:0000322]| abnormal spleen morphology [MP:0000689]| enlarged spleen [MP:0000691]| abnormal lymph node size [MP:0000701]| enlarged lymph nodes [MP:0000702]| increased body weight [MP:0001260]| decreased body weight [MP:0001262]| increased metastatic potential [MP:0001272]| abnormal response to new environment [MP:0001413]| altered susceptibility to infection [MP:0001793]| abnormal humoral immune response [MP:0001800]| decreased IgG level [MP:0001805]| decreased IgM level [MP:0001806]| decreased IgA level [MP:0001807]| abnormal inflammatory response [MP:0001845]| increased inflammatory response [MP:0001846]| brain inflammation [MP:0001847]| kidney inflammation [MP:0001859]| liver inflammation [MP:0001860]| lung inflammation [MP:0001861]| stomach inflammation [MP:0001873]| decreased inflammatory response [MP:0001876]| abnormal lactation [MP:0001882]| mammary gland alveolar hyperplasia [MP:0001884]| decreased litter size [MP:0001935]| abnormal lung volume [MP:0001942]| increased airway responsiveness [MP:0001952]| emphysema [MP:0001958]| increased B cell derived lymphoma incidence [MP:0002023]| increased T cell derived lymphoma incidence [MP:0002024]| increased lung adenocarcinoma incidence [MP:0002027]| increased sarcoma incidence [MP:0002032]| increased carcinoma incidence [MP:0002038]| increased pituitary adenoma incidence [MP:0002041]| decreased tumor incidence [MP:0002052]| premature death [MP:0002083]

abnormal spleen size [MP:0002224]| abnormal pulmonary alveolus morphology [MP:0002270]| decreased airway responsiveness [MP:0002335]| abnormal lymph node cortex morphology [MP:0002343]| abnormal lymph node primary follicle morphology [MP:0002345]| abnormal lymph node secondary follicle morphology [MP:0002346]| abnormal spleen red pulp morphology [MP:0002356]| abnormal spleen white pulp morphology [MP:0002357]| abnormal dendritic cell physiology [MP:0002376]| increased susceptibility to bacterial infection [MP:0002412]| increased susceptibility to viral infection [MP:0002418]| abnormal adaptive immunity [MP:0002420]| altered susceptibility to autoimmune disorder [MP:0002425]| abnormal macrophage physiology [MP:0002451]| abnormal dendritic cell antigen presentation [MP:0002455]| abnormal B cell physiology [MP:0002459]| decreased immunoglobulin level [MP:0002460]| increased immunoglobulin level [MP:0002461]| abnormal immunoglobulin level [MP:0002490]| decreased IgE level [MP:0002492]| increased IgE level [MP:0002497]| abnormal type IV hypersensitivity reaction [MP:0002534]| glomerulonephritis [MP:0002743]| decreased vertical activity [MP:0002757]| albuminuria [MP:0002871]| increased circulating alanine transaminase level [MP:0002941]| abnormal cytokine secretion [MP:0003009]| abnormal redox activity [MP:0003186]| small intestinal inflammation [MP:0003306]| abnormal tumor morphology [MP:0003448]| increased fear-related response [MP:0003459]| abnormal pancreatic beta cell physiology [MP:0003562]| increased ovarian carcinoma incidence [MP:0003579]| increased autoantibody level [MP:0003725]| decreased autoantibody level [MP:0003726]| abnormal nitric oxide homeostasis [MP:0003957]| abnormal lung vasculature morphology [MP:0004007]| abnormal maternal decidual layer morphology [MP:0004256]| decreased length of allograft survival [MP:0004752]| decreased anti-nuclear antigen antibody level [MP:0004795]| decreased anti-double stranded DNA antibody level [MP:0004798]| increased susceptibility to experimental autoimmune encephalomyelitis [MP:0004799]| decreased susceptibility to systemic lupus erythematosus [MP:0004802]| decreased susceptibility to autoimmune diabetes [MP:0004804]| abnormal immune tolerance [MP:0005000]| increased eosinophil cell number [MP:0005011]| increased lymphocyte cell number [MP:0005013]| increased T cell number [MP:0005015]| abnormal response to infection [MP:0005025]| decreased susceptibility to parasitic infection [MP:0005026]| increased susceptibility to parasitic infection [MP:0005027]| abnormal MHC II cell surface expression on macrophages [MP:0005040]| impaired natural killer cell mediated cytotoxicity [MP:0005070]| abnormal cytotoxic T cell physiology [MP:0005078]| decreased double-negative T cell number [MP:0005089]| cachexia [MP:0005150]| abnormal response to injury [MP:0005164]| decreased susceptibility to injury [MP:0005166]| abnormal renal glomerulus morphology [MP:0005325]| atherosclerotic lesions [MP:0005338]| decreased susceptibility to autoimmune disorder [MP:0005351]| abnormal Langerhans cell physiology [MP:0005362]| increased susceptibility to fungal infection [MP:0005399]| abnormal skin physiology [MP:0005501]| corneal vascularization [MP:0005542]| decreased circulating creatinine level [MP:0005554]| increased blood urea nitrogen level [MP:0005565]| decreased susceptibility to type IV hypersensitivity reaction [MP:0005616]| increased susceptibility to type IV hypersensitivity reaction [MP:0005617]| abnormal response to transplant [MP:0005671]| abnormal mammary gland growth during pregnancy [MP:0006269]| increased NK T cell number [MP:0008039]| abnormal uterine NK cell morphology [MP:0008054]| increased CD4-positive [MP:0008074]| alpha beta T cell number [MP:0008078]| increased CD8-positive [MP:0008135]| alpha-beta T cell number [MP:0008466]| small Peyer's patches [MP:0008474]| enlarged mesenteric lymph nodes [MP:0008496]| absent spleen germinal center [MP:0008497]| decreased IgG2a level [MP:0008498]| decreased IgG2b level [MP:0008499]| decreased IgG3 level [MP:0008523]| increased IgG1 level [MP:0008567]| absent lymph node germinal center [MP:0008596]|

decreased interferon-gamma secretion [MP:0008660]] increased circulating interleukin-6 level [MP:0008661]] increased interleukin-10 secretion [MP:0008663]] decreased interleukin-10 secretion [MP:0008681]] increased interleukin-12 secretion [MP:0008687]] increased interleukin-17 secretion [MP:0008699]] increased interleukin-2 secretion [MP:0008702]] increased interleukin-4 secretion [MP:0008713]] increased interleukin-5 secretion [MP:0008770]] abnormal cytokine level [MP:0008828]] decreased survivor rate [MP:0008874]] abnormal lymph node cell ratio [MP:0009099]] decreased physiological sensitivity to xenobiotic [MP:0009246]] abnormal uterine NK cell physiology [MP:0009336]] pale spleen [MP:0009394]] increased splenocyte proliferation [MP:0009419]] increased uterine NK cell number [MP:0009643]] skeletal muscle fibrosis [MP:0009763]] abnormal urine homeostasis [MP:0009766]] increased sensitivity to induced morbidity/mortality [MP:0009788]] increased sensitivity to xenobiotic induced morbidity/mortality [MP:0009791]] increased susceptibility to bacterial infection induced morbidity/mortality [MP:0009828]] increased susceptibility to viral infection induced morbidity/mortality [MP:0010210]] increased tumor latency [MP:0010308]] abnormal circulating cytokine level [MP:0010574]] decreased tumor latency [MP:0010639]] aorta dilation [MP:0010659]] altered tumor pathology [MP:0010740]] abdominal aorta aneurysm [MP:0010750]] abnormal dendritic cell chemotaxis [MP:0010751]] increased susceptibility to parasitic infection induced morbidity/mortality [MP:0010760]] decreased susceptibility to parasitic infection induced morbidity/mortality [MP:0010766]] abnormal macrophage chemotaxis [MP:0011086]] abnormal NK cell physiology [MP:0011320]] postnatal lethality [MP:0011427]] incomplete penetrance [MP:0012431]] abnormal glomerular capillary morphology [MP:0013239]] mesangial cell hyperplasia [MP:0013590]] increased lymphoma incidence [MP:0030466]] abnormal cytokine secretion [MP:0003009]] thyroid inflammation [MP:0003504]] insulinitis [MP:0004031]] decreased susceptibility to autoimmune diabetes [MP:0004804]] periinsulinitis [MP:0005580]] decreased physiological sensitivity to xenobiotic [MP:0008874]] abnormal esophageal epithelium morphology [MP:0000468]] enlarged thymus [MP:0000709]] increased activated T cell number [MP:0001829]] brain inflammation [MP:0001847]] increased T cell derived lymphoma incidence [MP:0002024]] abnormal T cell differentiation [MP:0002145]] abnormal lymphopoiesis [MP:0002401]] decreased immunoglobulin level [MP:0002460]] abnormal cytokine secretion [MP:0003009]] esophageal inflammation [MP:0003278]] insulinitis [MP:0004031]] increased length of allograft survival [MP:0004751]] decreased susceptibility to experimental autoimmune encephalomyelitis [MP:0004800]] increased susceptibility to autoimmune diabetes [MP:0004803]] abnormal class switch recombination [MP:0004816]] abnormal regulatory T cell physiology [MP:0004946]] decreased regulatory T cell number [MP:0004974]] abnormal T cell clonal deletion [MP:0005002]] increased eosinophil cell number [MP:0005011]] increased susceptibility to parasitic infection [MP:0005027]] abnormal cytotoxic T cell physiology [MP:0005078]] decreased cytotoxic T cell cytolysis [MP:0005079]] decreased T cell proliferation [MP:0005095]] increased T cell proliferation [MP:0005348]] abnormal CD4-positive [MP:0005463]] alpha-beta T cell physiology [MP:0005465]] abnormal T-helper 1 physiology [MP:0005466]] abnormal T-helper 2 physiology [MP:0005596]] increased susceptibility to type I hypersensitivity reaction [MP:0005671]] abnormal response to transplant [MP:0006413]] increased T cell apoptosis [MP:0008049]] increased memory T cell number [MP:0008074]] increased CD4-positive [MP:0008078]] alpha beta T cell number [MP:0008192]] increased CD8-positive [MP:0008482]] alpha-beta T cell number [MP:0008495]] abnormal germinal center B cell physiology [MP:0008496]] decreased spleen germinal center number [MP:0008497]] decreased IgG1 level [MP:0008500]] decreased IgG2a level [MP:0008566]] decreased IgG2b level [MP:0008567]] increased IgG2a level [MP:0008578]] increased interferon-

gamma secretion [MP:0008603]| decreased interferon-gamma secretion [MP:0008687]| decreased circulating interferon-gamma level [MP:0008688]| decreased circulating interleukin-4 level [MP:0008699]| increased interleukin-2 secretion [MP:0008700]| decreased interleukin-2 secretion [MP:0008747]| increased interleukin-4 secretion [MP:0009335]| decreased interleukin-4 secretion [MP:0010268]| abnormal T cell anergy [MP:0010766]

**Affected Gene:** Cd28||Ifng|||

**Catalog Number:** 037141-MU

**Background:** Targeted Mutation

**Database:** Mutant Mouse Resource and Research Center (MMRRC)

**Database Abbreviation:** MMRRC

**Alternate IDs:** MMRRC\_37141-MU, MMRRC\_037141, MMRRC\_37141

**Organism Name:** NOD.Cg-Cd28<sup>tm1Mak</sup> Ifng<sup>tm1Ts</sup> H2<sup>h4</sup>/HbmMmmh

**Record Creation Time:** 20230308T055150+0000

**Record Last Update:** 20260829T123626+0000

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## Ratings and Alerts

No rating or validation information has been found for NOD.Cg-Cd28<sup>tm1Mak</sup> Ifng<sup>tm1Ts</sup> H2<sup>h4</sup>/HbmMmmh.

**Warning:** Warning. Researchers have noted that this genotype does not sufficiently model human systemic lupus erythematosus.

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## Data and Source Information

**Source:** [Integrated Animals](#)

**Source Database:** Mutant Mouse Resource and Research Center (MMRRC)

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## Usage and Citation Metrics

We found 1 mentions in open access literature.

**Listed below are recent publications.** The full list is available at [NIF](#) .

Voynova E, et al. (2018) Requirement for CD40/CD40L Interactions for Development of Autoimmunity Differs Depending on Specific Checkpoint and Costimulatory Pathways. ImmunoHorizons, 2(1), 54.