Also Known As: Non-obese Diabetic, NOD

The NOD/ShiLtJ strain (commonly called NOD) is a polygenic model for autoimmune type 1 diabetes. Diabetes in NOD mice is characterized by hyperglycemia and insulitis, a leukocytic infiltration of the pancreatic islets. Marked decreases in pancreatic insulin content occur in females at about 12 weeks of age and several weeks later in males. A 2017 phenotyping study found that 90% of females and 52% of males became diabetic by 30 weeks; median female incidence was 18 weeks. Immune phenotypes in the NOD background consist of defects in antigen presentation, T lymphocyte repertoire, NK cell function, macrophage cytokine production, wound healing, and C5 complement. These defects make the NOD background a common choice for immunodeficient mouse strains. Diabetes onset data is available.

Our preclinical efficacy testing services offer scientific expertise and an array of target-based and phenotype-based outcome measures, both in vivo and at endpoint, for flexible study designs and assay development in mouse models of Diabetes. See our full service platform.
Important Note
This strain is homozygous for Cdh23<sup>ahl</sup>, the age related hearing loss 1 mutation, which on this background results in progressive hearing loss that is already severe by three months of age.

Detailed Description
Diabetes in NOD/ShiLtJ mice is characterized by insulitis, a leukocytic infiltrate of the pancreatic islets. Marked decreases in pancreatic insulin content occur in females at about 12 weeks of age and several weeks later in males. Onset of diabetes is marked by moderate glycosuria and by a non-fasting plasma glucose higher than 250 mg/dl. Diabetic mice are
hypoinsulinemic and hyperglucagonemic, indicating a selective destruction of pancreatic islet beta cells. Susceptibility to IDDM in NOD/ShiLtJ mice is polygenic, and environment, including housing conditions, health status, and diet, exerts a strong effect on penetrance. NOD/ShiLtJ females are more widely used than males because the onset of IDDM symptoms occurs earlier and with a higher incidence (90-100% by 30 weeks of age). NOD/ShiLtJ males develop IDDM at a frequency of between 40-60% by 30-40 weeks of age. Male mice are useful for certain applications, including pharmaceutical studies, "accelerated transfer" of IDDM, and some in vitro studies. The major component of diabetes susceptibility in NOD mice is the unique MHC haplotype ($H2^g7 = K^d_a, Aa^g7, Ab^g7, E^null, D^b$). NOD mice also exhibit multiple aberrant immunophenotypes including defective antigen presenting cell immunoregulatory functions, defects in the regulation of the T lymphocyte repertoire, defective NK cell function, defective cytokine production from macrophages (Fan et al., 2004) and impaired wound healing. They also lack hemolytic complement, C5. NOD/ShiLtJ mice also are severely hearing-impaired. A variety of mutations causing immunodeficiencies, targeted mutations in cytokine genes, as well as transgenes affecting immune functions, have been backcrossed into the NOD/ShiLt inbred strain background.

Development

Control Suggestions

Selected References

Genetics

$Hc^0$

$Cdh23^{ahl}$

$H2^g7$

$mt-Tr^{m1}$

$Il2^{m1}$

$Gpr84^{del}$

Del(3)1Lt

Del(1)2Lt

Del(3)3Lt

$Cox7a2^d$

Disease/Phenotype
Genotyping Protocols
Genotyping resources and troubleshooting
Inbred mouse strains are maintained through sibling (sister x brother) matings; no genotyping required.

Dietary Information
LabDiet® 5K52 formulation (6% fat)

Breeding Considerations
This strain is an exceptional breeder.

A footpad injection of Complete Freund's Adjuvant (CFA) administered once at weaning will delay diabetes onset, thus extending the lifespan of breeders. A discussion on the use of Complete Freund's Adjuvant in NOD mice can be found in Current Protocols in Immunology pages 15.9.1-15.9.23 (see PDF link under Immunological protocols).

Additional Breeding and Husbandry Support

Mating System
Sibling x Sibling

Appearance
albino

Related Genotype: A/A Tyr^c/Tyr^c

Citation
When using the NOD mouse strain in a publication, please include JAX stock #001976 in your Materials and Methods section.

Animal Health Reports
Facility Barrier Level Descriptions

- AX5 (Standard)
- RB10 (Maximum)
### Pricing & Availability

**Readily available in any quantity needed.**

#### Live Mouse

**Domestic**

Pricing effective for USA, Canada and Mexico shipping destinations

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<tr>
<th>AGE</th>
<th>SEX</th>
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<td>3 weeks</td>
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<td>10 weeks</td>
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#### Volume Pricing Details

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<tr>
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**Volume Pricing Program**

Quantities: Volume pricing is automatically applied when a minimum quantity per strain for a shipment is reached

Sexes: Sexes of the same strain may be combined to reach minimum quantity levels to receive the volume pricing

Shipment: All shipping destinations qualify

### Related Products and Services

| Mouse ES Cells | NOD/ShiLj AC576/GrsJ mES cells | $2500.00 |
PAYMENT TERMS AND CONDITIONS

Terms are granted by individual review and stated on the customer invoice(s) and account statement. These transactions are payable in U.S. currency within the granted terms. Payment for services, products, shipping containers, and shipping costs that are rendered are expected within the payment terms indicated on the invoice or stated by contract. Invoices and account balances in arrears of stated terms may result in The Jackson Laboratory pursuing collection activities including but not limited to outside agencies and court filings.

THE JACKSON LABORATORY’S GENOTYPE PROMISE

The Jackson Laboratory has rigorous genetic quality control and mutant gene genotyping programs to ensure the genetic background of JAX® Mice strains as well as the genotypes of strains with identified molecular mutations. JAX® Mice strains are only made available to researchers after meeting our standards. However, the phenotype of each strain may not be fully characterized and/or captured in the strain data sheets. Therefore, we cannot guarantee a strain’s phenotype will meet all expectations. To ensure that JAX® Mice will meet the needs of individual research projects or when requesting a strain that is new to your research, we suggest ordering and performing tests on a small number of mice to determine suitability for your particular project. We do not guarantee breeding performance and therefore suggest that investigators order more than one breeding pair to avoid delays in their research.

Terms Of Use

TERMS OF USE

General Terms and Conditions

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Phone: 207-288-6470
Email: TechTran@jax.org

Related Strains

All

By Allele
By Gene
By Collection