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NOD-Rag IL2rynull Ins2Akita - Mouse Strain RES4143

Mouse Information

Common Name:	NOD-Rag IL2rynull Ins2Akita
MGI Official Name:	NOD.Cg-Rag1^{tm1Mom}Ins2^{Akita}Il2rg^{tm1Wjl}/SzJ
Description:	NRG-Akita mice, which are homozygous for the Rag1tm1Mom and the Il2rgtm1Wjl alleles (males are hemizygous for the X-linked Il2rgtm1Wjl allele) and heterozygous for the Ins2Akita allele, develop spontaneous hyperglycermia. No mature T, B or NK cells are detected in flow cytometric analysis of splenocytes from NRG-Akita mutant mice. Granulocyte and macrophage populations are similar to those seen in NRG mice. NRG-Akita mice develop hyperglycemia between 3 and 5 weeks of age. Histological examination at 3 weeks of age reveals normal pancreas morphology, and routine insulin and glucagon staining. By approximately 32 weeks of age, NRG-Akita mice display disorganized, condensed pancreatic islet architecture, with loss of insulin-positive cells. Euglycemia is restored by subrenal transplantation of mouse or human islets or intrapancreatic transplantation of dissociated mouse islet cells. NRG-Akita mice engrafted with human hematopoietic stem cells (HSC) develop humanized immune systems. Approximately 60% of the human HSC engrafted NRG-Akita mice reject human islet allografts.
Categories:	None specified.

Genetic Alterations

1) Targeted Mutagenesis	
Type of Allele	Global Null
Targeted Gene	interleukin 2 receptor, gamma chain (Il2rg - NCBI GeneID:16186)
Targeted Allele	targeted mutation 1 (Il2rg^{tm1Wjl} - MGI:96551)
Description of Targeting Vector	A neomycin resistance cassette replaced part of exon 3 and all of exons 4 - 8 of the gene, resulting in the loss of most of the extracellular domain and all of the transmembrane and cytoplasmic domains of the protein.
Targeting Vector Genbank File	*Not provided*
Citations	Not Available
2) Targeted Mutagenesis	
Type of Allele	Other
Targeted Gene	insulin II (Ins2 - NCBI GeneID:16334)
Targeted Allele	Akita (Ins2^{Akita} - MGI:1857572)
Description of Targeting Vector	In the mutant allele a transition from G to A at nucleotide 1907 disrupted an Fnu4HI site in exon 3. This mutation changed the seventh amino acid in the A chain of mature insulin, Cys96 (TGC), to Tyr (TAC). The authors predict that the transition would disrupt a disulfide bond between the A and the B chains and would likely induce a major conformational change in insulin 2 molecules. RT-PCR studies suggest that both normal and mutant Ins2 alleles are transcribed similarly in pancreatic islets of heterozygous mice, although immunofluorescence and immunoblot analyses of heterozygous islets detected reduced levels of

Access Status

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Primary contributor: Shultz Lab
Co-contributed by:
- Greiner Lab
- Herrera Lab

Resource Tags

mouse, mouse strain, NOD-Rag IL2rynull Ins2Akita

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Resource History & Actions

Approved on Feb 26, 2013
Last modified on Nov 15, 2011

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	insulin and proinsulin.
Targeting Vector Genbank File	*Not provided*
Citations	Not Available
3) Targeted Mutagenesis	
Type of Allele	Global Null
Targeted Gene	recombination activating gene 1 (Rag1 - NCBI GeneID:19373)
Targeted Allele	targeted mutation 1, Peter Mombaerts ($Rag1^{tm1Mom}$ - MGI:1857241)
Description of Targeting Vector	A 1356 bp genomic fragment of the Rag1 gene, encoding the nuclear localization signal and the zinc-finger motif, was replaced by a neomycin cassette. A mutant transcript expressed from this allele was detected by Northern blot in bone marrow derived cell lines from homozygous mice.
Targeting Vector Genbank File	*Not provided*
Citations	Not Available

Strain Information

No strain information has been supplied

Associated Images

No associated images have been supplied

Repositories

The Jackson Laboratory	
No URL supplied for repository	**Stock #:** 014568 **Availability Notes:** *Not provided*

Contact Information

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Associated Publications

No publications associated

Comments

There are no comments for this entry.

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