NOD.Rag1 Tg(HLA-DRA, HLA-DRB1*0401)

Stock No: 017914 | DRAG

Available

PLACE ORDER

Live mice available in varying quantities. Ask Customer Service for details.
Overview

Also Known As: DRAG

DRAG mice are NOD.Rag1KO.II2RcKO ("NRG") animals with chimeric human-mouse class II transgenes encoding the HLA class II antigen binding domain molecules (defined by the HLA-DR4 genotype [HLA-DRA/HLA-DRB1*0401]) fused to the I-E^d MHC class II molecule. The presence of these HLA-DR4-I-E transgenes allows enhanced HLA-DR-matched hematopoietic stem cells (HSC) engraftment and subsequent human T cell and B cell development. Because the human HLA-DR4 genotype is associated with the development of autoimmune diseases (rheumatoid arthritis, multiple sclerosis, type 1 diabetes, and Lyme disease-induced arthritis), these DRAG mice may be useful as an in vivo model for studying human T cell/B cell development and function, vaccine testing, and generation of "fully human" IgM, IgG, IgA or IgE monoclonal antibodies for prophylactic and/or therapeutic use in autoimmune diseases and infectious diseases.

Donating Investigator

Sofia Casares, Walter Reed Army Inst Res/Naval Med Res

GENETIC OVERVIEW

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
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<td>?pN1+N1F1</td>
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Tg(HLA-DRA,HLA-DRB1*0401)39-2Kito

<table>
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<tr>
<th>Allele Type</th>
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<tbody>
<tr>
<td>Transgenic (Inserted expressed sequence, Humanized sequence)</td>
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**VIEW GENETICS**

<table>
<thead>
<tr>
<th>Allele Type</th>
<th>Gene Symbol</th>
<th>Gene Name</th>
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<tr>
<td>Targeted (Null/Knockout)</td>
<td>Rag1</td>
<td>recombination activating gene 1</td>
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<tr>
<th>Allele Type</th>
<th>Gene Symbol</th>
<th>Gene Name</th>
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<tr>
<td>Targeted (Null/Knockout)</td>
<td>Il2rg</td>
<td>interleukin 2 receptor, gamma chain</td>
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**RESEARCH APPLICATIONS**

Cancer Research  
Hematological Research  
Immunology, Inflammation and Autoimmunity Research  
Research Tools  
Internal/Organ Research  
Virology Research  

**VIEW ALL RESEARCH APPLICATIONS**

**BASE PRICE**

Starting at:  
- $302.15 Domestic price for male 4-week  
- $289.77 Domestic price for breeder pair  

**VIEW PRICE LIST**

**Details**

**Detailed Description**

DRAG mice are NOD.Rag1KO.IL2RγcKO ("NRG"; Stock No. 007799) animals with chimeric human-mouse class II transgenes encoding the HLA class II antigen binding domain molecules (defined by the HLA-DR4 genotype [HLA-DRA/HLA-DRB1*0401]) fused to the I-E MHC class II molecule. The presence of these HLA-DR4-I-E transgenes allows irradiated DRAG mice to be engrafted with HLA-DR-matched hematopoietic stem cells (HSC); resulting in humanized T cell and B cell populations.

DRAG females homozygous for both mutations and homozygous for the co-injected transgenes (and DRAG males homozygous for the Rag1KO mutation; hemizygous for the X-linked IL2RγcKO mutation; homozygous for the co-injected transgenes) are viable and fertile, with no mature T cells, B cells, or natural killer (NK) cells. Like NRG mice, DRAG mice have the same irradiation/engraftment advantages compared to NOD.scidKO.IL2RγcKO ("NSG"; Stock No. 005557), NOD.Rag1KO (Stock No. 003729), and NOD.scidKO (Stock No. 001303) mice. DRAG mice differ from NRG mice only in that DRAG mice have transgenic expression of HLA class II antigen-binding domain molecules (HLA-DR4) under the I-E promotor. In humans, the HLA-DR4 genotype (HLA-DRA/HLA-DRB1*0401) is associated with the development of autoimmune diseases such as rheumatoid arthritis, multiple sclerosis, type 1 diabetes, and lyme disease-induced arthritis. The HLA-DR4-I-E transgenes allow irradiated DRAG mice to be engrafted with HLA-DR-matched HSC; resulting in humanized T cell and B cell populations.

Specifically, when irradiated DRAG and NRG mice are engrafted with HLA-DR-matched umbilical cord blood HSC, the HLA-DR4-expression in DRAG mice results in several advantages compared to NRG mice:  
1) DRAG mice show improved early engraftment and expansion of HLA-DR-matched hematopoietic stem cells in bone marrow.  
2) Such engraftment results in homing and development of bone-marrow-derived human T cell precursors in thymus, as well as
proficient repopulation of peripheral lymphoid organs with mature CD4 cells and CD8 T cells.

iii) The repopulation of mature CD8 T cells in the periphery is noteworthy as DRAG mice do not express HLA class I molecules (the restriction element for thymic differentiation of human CD8 T cells).

iv) The T regulatory cell compartment (human CD4+FOXP3+ Tregs) is also reconstituted.

v) While engrafted DRAG and NRG mice develop similar human dendritic cell (spleen) and human B cell (periphery or spleen) percentages compared to human populations, the human B cells in DRAG mice are functional and secrete all human immunoglobulin classes (whereas human B cells in NRG mice secrete only IgM and have impaired class-switching).

vi) Neither DRAG or NRG mice develop significant populations of human natural killer (NK) cells in the spleen following engraftment.
Breeding Considerations
When maintaining a live colony, DRAG females homozygous for the Rag1KO mutation; homozygous for the X-linked IL2RγcKO mutation, and non-carrier may be bred to DRAG males homozygous for the Rag1KO mutation; hemizygous for the X-linked IL2RγcKO mutation, and hemizygous for the co-injected transgenes. These mice are immunocompromised (lacking mature T cells, B cells, and natural killer (NK) cells).

Depending upon the experiment, the following may be appropriate control strain(s): NOD.Rag1KO.IL2RγcKO ("NRG"; Stock No. 007799), NOD.Rag1KO.Deleted (NOD.Rag1KO; Stock No. 003729), or NOD/ShiLtJ inbred mice (Stock No. 001976).

Additional Breeding and Husbandry Support
Mating System
Females homozygous for the Rag1KO mutation homozygous for the X-linked IL2RγcKO mutation, and wildtype for the co-injected Tg(HLA-DRA,HLA-DRB1*0401)39-2Kito transgenes may be bred to males homozygous for the Rag1KO mutation hemizygous for the X-linked IL2RγcKO mutation cKO mutation, and hemizygous for the co-injected Tg(HLA-DRA,HLA-DRB1*0401)39-2Kito transgenes

Citation
When using the DRAG mouse strain in a publication, please cite the originating article(s) and include JAX stock #017914 in your Materials and Methods sections.

Pricing & Availability
Live mice available in varying quantities. Ask Customer Service for details.
<table>
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<th>6 weeks</th>
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<th>11 weeks</th>
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<tbody>
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**Related Products and Services**

Frozen Mouse Embryo  
NOD.Cg-Rag1<tm1Mom> II2rg<tm1Wjl> Tg(HLA-DRA HLA-DRB1*0401)39-2Kito  
$2595.00

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