MRL/MpJ

Stock No: 000486 | MRL

Inbred Strain

AVAIL NOW

PLACE ORDER

Sized to accommodate orders of up to 50 or more. Ask Customer Service for details.

Overview

Also Known As: Murphy Roths Large, MRL

The MRL/MpJ mice are the parent and control strain for MRL/MpJ-Fas<sup>1of</sup> (Stock Nos. 000485, 006825). Despite carrying the
normal Fas gene, MRL/MpJ mice also exhibit autoimmune disorders, but symptoms are manifested much later in life compared to those the MRL/MpJ-Fas<sup>lpr</sup> mice. As a strain developed as the control for MRL/MpJ-Fas<sup>lpr</sup>, MRL/MpJ mice are useful in the study of their comparable defects and diseases, including systemic lupus erythematosus and Sjögren syndrome.

**GENETIC OVERVIEW**

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contact Technical Support</td>
</tr>
<tr>
<td></td>
<td>(2018-07-27 00:00:00)</td>
</tr>
</tbody>
</table>

**RESEARCH APPLICATIONS**

Internal/Organ Research  
Immunology, Inflammation and Autoimmunity Research  
Neurobiology Research  
Sensorineural Research

**BASE PRICE**

Starting at:  
$100.93 Domestic price for female 3-week

**Details**

**Detailed Description**

The MRL/MpJ mice are large but docile to the point that males rarely fight. They are the parent and control strain for for MRL/MpJ-Fas<sup>lpr</sup> (Stock Nos. 000485, 006825). Despite carrying the normal Fas gene, MRL/MpJ mice also exhibit autoimmune disorders, but symptoms are manifested much later in life compared to those the MRL/MpJ-Fas<sup>lpr</sup> mice. Starting at about three months of age, levels of circulating immune complexes rise greatly in the MRL-Fas<sup>lpr</sup> mouse but not in the wildtype control, MRL/MpJ. Also beginning at 3 months Fas<sup>lpr</sup> mice exhibit very severe proliferative glomerulonephritis, whereas in the MRL/MpJ controls usually only mild glomerular lesions are detected. MRL/MpJ inbred female typically die at 73 weeks of age and males die at 93 weeks. This compares to a lifespan of 17 weeks in the female and 22 weeks for males in the mouse homozygous for Fas<sup>lpr</sup>. See MRL/MpJ-Fas<sup>lpr</sup> (Stock No. 000485) for additional information. As a strain developed as the control for MRL/MpJ-Fas<sup>lpr</sup>, MRL/MpJ mice are useful in the study of their comparable defects and diseases.

MRL/MpJ, and one of its ancestral strains LG/J, display heightened wound healing relative to a panel of other inbred strains. At 4
weeks post-injury, 2mm ear punch wounds heal to 0.0-0.4mm in MRL/MpJ mice but are still 1.2-1.6mm in C57BL/6 mice. At 15 days post-injury C57BL/6 show a maximal closure of 30% reduction in ear hole size while MRL show 85% reduction. The process of healing in MRL/MpJ mice is faster, more complete, showed increased swelling, angiogenesis, fibroblast migration, extracellular matrix deposition, and decreased scarring and fibrosis. Additionally, hair follicles and accompanying sebaceous glands regenerate to a much greater degree. The other ancestral strains of MRL/MpJ (C3H, C57BL/6, and AKR) do not display this enhanced healing. Bone marrow transplantation shows that the MRL/MpJ healing phenotype does not readily transfer with bone marrow and remains in the irradiated host tissues. Enhanced healing of cardiac wounds has also been reported in MRL/MpJ mice. In this model, a very high mitotic index (10-20%) is found, similar to that seen in non-mammalian tissue regeneration. Using F2 and backcross mapping of MRL/MpJ-Fas<sup>lo</sup>x B6 progeny McBrearty et al. identified multiple wound healing QTLs. Heal2 and Heal3 on MRL/MpJ chromosome 13 in the region of D13Mit115 and D13Mit129 respectively; Heal5 on MRL/MpJ chromosome 12 in the region of D12Mit233; Heal1 on chromosome 8 of C57BL/6 in the region of D8Mit211; and a highly suggestive locus on MRL/MpJ chromosome 7 in the region of D7Mit220. In crosses between MRL/MpJ x SJL/J, Masinde et al. identified 10 QTL for wound healing, confirming and extending the findings of McBrearty et al. Chromosomes 1, 3, 6, and 13 each have a single QTL with that on chromosome 13 being statistically suggestive but not significant, while chromosomes 4, 7, and 9 each have two statistically significant QTLs. (Clark et al., 1998; Leferovich et al., 2001; Kench et al., 1999; McBrearty et al., 1998; Masinde et al., 2001.)

Microarray analysis and SELDI ProteinChip analysis identified multiple genes and proteins that have varied expression in the ear punch wounds of MRL/MpJ-Fas<sup>lo</sup> versus C57BL/6. The changes in expression patterns suggest that in MRL/MpJ mice there is less of an inflammatory response and an earlier transition into tissue repair than is seen in C57BL/6. (Li et al., 2000 and 2001.)

Blankenhorn et al. found that MRL/MpJ females heal faster and more completely than males. Some Heal QTLs are sexually dimorphic with Heal2, 3, 7, 8, 10, and 11 having greater effects in males and Heal4, 5, and 9 having greater effects in females. Castration improves wound healing in MRL/MpJ males to nearly the degree seen in females, but ovariectomy does not improve the degree of healing seen in MRL/MpJ females. (Blankenhorn et al., 2003)

Relative to B10.D2nSnJ mice, MRL/MpJ mice have decreased Neutrophil accumulation in the bronchiolar lavage in response to LPS infusion, and tests using bone marrow chimeras reveal that the pulmonary inflammatory response transfers with bone marrow. Transforming growth factor beta 1 autologous induction is reduced in MRL/MpJ splenocytes while macrophages show a reduction in the transforming growth factor beta 1 induction of interleukin 1 beta and tumor necrosis factor alpha production but no significant reduction in transforming growth factor beta 1 production. (Kench et al., 1999.)
Genotype Information

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 a good breeder.
Due to the heightened healing which occurs in mice with the MRL genetic background, ear punch is not a good method for individual mouse identification in this strain.

Additional Breeding and Husbandry Support

Mating System
Sibling x Sibling

Appearance
albino, unaffected
Related Genotype: a/a Tyr<sup>c</sup>/Tyr<sup>c</sup> Fas<sup>+</sup>/Fas<sup>+</sup>

Citation
Animal Health Reports
When using the MRL mouse strain in a publication, please include JAX stock #000486 in your Materials and Methods section.

Facility Barrier Level Descriptions
- AX28 (Maximum)
- RB08 (Maximum)

Pricing & Availability

Sized to accommodate orders of up to 50 or more. Ask Customer Service for details.

<table>
<thead>
<tr>
<th>AGE</th>
<th>SEX</th>
<th>GENOTYPE</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 weeks</td>
<td>Female</td>
<td>Not Applicable</td>
<td>$100.93</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Not Applicable</td>
<td>$100.93</td>
</tr>
<tr>
<td>Weeks</td>
<td>SEX</td>
<td>Rate</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-----</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>$100.93</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Male</td>
<td>$100.93</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Female</td>
<td>$104.38</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Male</td>
<td>$104.38</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Female</td>
<td>$107.83</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Male</td>
<td>$107.83</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>$111.28</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Male</td>
<td>$111.28</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Female</td>
<td>$114.73</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Male</td>
<td>$114.73</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Female</td>
<td>$118.18</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Male</td>
<td>$118.18</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Female</td>
<td>$121.63</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Male</td>
<td>$121.63</td>
<td></td>
</tr>
</tbody>
</table>

**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.

**Terms Of Use**

**General Terms and Conditions**

**Licensing Information**

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

**JAX® Mice, Products & Services Conditions of Use**

“MICE” means mouse strains, their progeny derived by inbreeding or crossbreeding, unmodified derivatives from mouse strains or their progeny supplied by The Jackson Laboratory (“JACKSON”). “PRODUCT(S)” means biological materials supplied by JACKSON, and their derivatives. “SERVICES” means projects conducted by JACKSON for other parties that may include but are not limited to the use of MICE or PRODUCTS. “RECIPIENT” means each recipient of MICE, PRODUCTS, or SERVICES provided by JACKSON including each
institution, its employees and other researchers under its control. MICE or PRODUCTS shall not be: (i) used for any purpose other than internal research, (ii) sold or otherwise provided to any third party for any use, or (iii) provided to any agent or other third party to provide breeding or other services. Acceptance of MICE, PRODUCTS or SERVICES from JACKSON shall be deemed as agreement by RECIPIENT to these conditions, and departure from these conditions requires JACKSON’s prior written authorization.

No Warranty
MICE, PRODUCTS AND SERVICES ARE PROVIDED "AS IS". JACKSON EXTENDS NO WARRANTIES OF ANY KIND, EITHER EXPRESS, IMPLIED, OR STATUTORY, WITH RESPECT TO MICE, PRODUCTS OR SERVICES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY WARRANTY OF NON-INFRINGEMENT OF ANY PATENT, TRADEMARK, OR OTHER INTELLECTUAL PROPERTY RIGHTS.

Credit for PRODUCTS or SERVICES
In case of dissatisfaction for a valid reason and claimed in writing by a purchaser within ninety (90) days of receipt of, PRODUCTS or SERVICES, JACKSON will, at its option, provide credit or replacement for the PRODUCT received or the SERVICES provided; JACKSON makes no other representations and this shall be the exclusive remedy of the purchaser. Please note specific policy for live mice.

Animal Care and Use for SERVICES
Consistent with the requirement for a written understanding regarding animal care and use, the JACKSON Animal Care and Use Committee will review the animal care and use protocol(s) associated with any SERVICES to be performed at JACKSON, and JACKSON shall have ultimate responsibility and authority for the care of animals while on site or in JACKSON custody.

No Liability
In no event shall JACKSON, its trustees, directors, officers, employees, and affiliates be liable for any causes of action or damages, including any direct, indirect, special, or consequential damages, arising out of the provision of MICE, PRODUCTS, or SERVICES, including economic damage or injury to property and lost profits, and including any damage arising from acts or negligence on the part of JACKSON, its agents or employees. Unless prohibited by law, in purchasing or receiving MICE, PRODUCTS, or SERVICES from JACKSON, purchaser or recipient, or any party claiming by or through them, expressly releases and discharges JACKSON from all such causes of action or damages, and further agrees to defend and indemnify JACKSON from any costs or damages arising out of any third party claims.

MICE, PRODUCTS or SERVICES are to be used in a safe manner and in accordance with all applicable governmental rules and regulations.
The foregoing represents the General Terms and Conditions applicable to JACKSON’s MICE, PRODUCTS or SERVICES. In addition, special terms and conditions of sale of certain MICE, PRODUCTS, or SERVICES may be set forth separately in JACKSON web pages, catalogs, price lists, contracts, and/or other documents, and these special terms and conditions shall also govern the sale of these MICE, PRODUCTS and SERVICES by JACKSON, and by its licensees and distributors.
Acceptance of delivery of MICE, PRODUCTS or SERVICES shall be deemed agreement to these terms and conditions. No purchase order or other document transmitted by purchaser or recipient that may modify the terms and conditions hereof, shall be in any way binding on JACKSON, and instead the terms and conditions set forth herein, including any special terms and conditions set forth separately, shall govern the sale of MICE, PRODUCTS or SERVICES by JACKSON.

Related Strains

All

By Allele

By Gene

By Collection

All Related Strains