The Jackson Laboratory

MRL/MpJ

Stock No: **000486** | MRL

Inbred Strain

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Also Known As:Murphy Roths Large, MRL

The MRL/MpJ mice are the parent and control strain for for MRL/MpJ-*Fas*^{lpr} (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*^{lpr} mice. As a strain developed as the control for MRL/MpJ-*Fas*^{lpr}, MRL/MpJ mice are useful in the study of their comparable defects and diseases, including systemic lupus erythematosus and Sjorgren syndrome.

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GENETIC OVERVIEW

Genetic Background

Generation

Contact Technical Support
(2018-07-27 00:00:00)

VIEW GENETICS

RESEARCH APPLICATIONS

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

VIEW ALL RESEARCH APPLICATION

BASE PRICE

Starting at:

$100.93 Domestic price for female 3-week

VIEW PRICE LIST

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*^{lpr} (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*^{lpr} mice. Starting at about three months of age, levels of circulating immune complexes rise greatly in the MRL-*Fas*^{lpr} mouse but not in the wildtype control, MRL/MpJ. Also beginning at 3 months *Fas*^{lpr} mice exhibit very severe poliferative 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*^{lpr}. See MRL/MpJ-*Fas*^{lpr} (Stock No. 000485) for additional information. As a strain developed as the control for MRL/MpJ-*Fas*^{lpr}, 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 0-0.4mm 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*^{lpr} 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*^{lpr} 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.)

- Development
- Control Suggestions
- Selected References

Genetics

- *Il2*^{m1}
- *Gpr84*^{del}

Disease/Phenotype

- Disease Terms
- Research Areas By Phenotype
- Mammalian Phenotype Terms by Genotype
- Phenotype Information

References

Technical Support

CONTACT TECHNICAL SUPPORT

Genotyping Protocols
End Point Analysis:H2rs8249979 Alternate 1-EP
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*^{c}/*Tyr*^{c} *Fas*$^{+}$/*Fas*$^{+}$

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

Animal Health Reports
Facility Barrier Level Descriptions

- AX28 (Maximum)
- MP14 (Maximum)
- RB08 (Maximum)

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LIVE MOUSE

AGE	SEX	GENOTYPE	PRICE
3 weeks	Female	Not Applicable	$100.93
	Male	Not Applicable	$100.93
4 weeks	Female	Not Applicable	$100.93
	Male	Not Applicable	$100.93
5 weeks	Female	Not Applicable	$100.93
	Male	Not Applicable	$100.93
6 weeks	Female	Not Applicable	$104.38
	Male	Not Applicable	$104.38
7 weeks	Female	Not Applicable	$107.83
	Male	Not Applicable	$107.83
8 weeks	Female	Not Applicable	$111.28
	Male	Not Applicable	$111.28
9 weeks	Female	Not Applicable	$114.73
	Male	Not Applicable	$114.73
10 weeks	Female	Not Applicable	$118.18
	Male	Not Applicable	$118.18
11 weeks	Female	Not Applicable	$121.63
	Male	Not Applicable	$121.63

RELATED PRODUCTS AND SERVICES

Mouse ES Cells	MRL/MpJ mES cells	$1095.00

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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.

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