Overview

MRL / Mρα J

Stock No: 000485 | MRL-lpr

Spontaneous Mutation

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Also Known As: lymphoproliferation, MRL-1pr

This strain is commonly known as MRL-1pr or lpr mutant. Mice are homozygous for the lymphoproliferation spontaneous mutation (Fas<sup>1pr</sup>), and show systemic autoimmunity, massive lymphadenopathy associated with proliferation of aberrant T cells, arthritis, and immune complex glomerulonephrosis. Mice are useful as a model to determine the etiology of systemic lupus erythematosus (SLE) and Sjögren (Sicca) syndrome and to evaluate therapies. Information about lupus disease phenotypes in MRL-1pr is available here.

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Mice homozygous for the lymphoproliferative spontaneous mutation (Fas$^{lpr}$) show systemic autoimmunity, massive lymphadenopathy associated with proliferation of aberrant T cells, arthritis, and immune complex glomerulonephrosis. Starting at about three months of age, levels of circulating immune complexes rise greatly in the MRL-$lpr/lpr$ mouse but not the MRL normal (Hewicker 1990). Onset and severity of symptoms associated with the Fas$^{lpr}$ gene is strain-dependent. For example, lymphoproliferation varies greatly with congeneric strain C57BL/6-J-Fas$^{lpr}$/Fas$^{lpr}$ at a 24 fold increase over control lymph node weight, MRL/Mp-Fas$^{lpr}$/Fas$^{lpr}$ at 75 fold and congeneric strain C3H/HeJ-Fas$^{lpr}$/Fas$^{lpr}$ at 116 fold increase over control lymph node weight (Morse et al 1985). Variance in renal pathology ranks from extensive in MRL/Mp-Fas$^{lpr}$/Fas$^{lpr}$ at 4 to 7 months to negligible at 14 to 16 months in mice with C57BL/6J and C3H/HeJ backgrounds and homozygous for the Fas$^{lpr}$ (Kelley and Roths 1985). Spontaneous production of anti-dsDNA autoantibodies is likewise affected with percentage binding of radiolabeled dsDNA in Fas$^{lpr}$/Fas$^{lpr}$ mice varying from 5 percent on C57BL/6J to 26 percent on C3H/HeJ to as high as 49 percent on MRL/Mp (Izui et al 1984). Female MRL/Mp-Fas$^{lpr}$ mice die at an average age of 17 weeks of age and males at 22 weeks. This compares to between 42 and 52 weeks in females on the C57BL/6J or C3H/HeJ backgrounds and homozygous for the Fas$^{lpr}$ (Kelley and Roths 1985).

Important Note

July 2007: This strain has been recovered from cryopreservation and the original phenotype was observed: The sixteen-week old mice have lymph nodes that were 4.5 (females) to 10.1 times (males) larger than age and sex matched individuals from the former colony. Splenomegaly is 3 to 6 times greater and their life spans were also greatly reduced. The former version of this line, which displayed a loss of lymphoproliferative phenotype, has been renamed MRL/Mp-J-Fas$^{lpr}$/J and is available as Stock No. 006825.

Detailed Description

Mice homozygous for the lymphoproliferative spontaneous mutation (Fas$^{lpr}$) show systemic autoimmunity, massive lymphadenopathy associated with proliferation of aberrant T cells, arthritis, and immune complex glomerulonephrosis. Starting at about three months of age, levels of circulating immune complexes rise greatly in the MRL-$lpr/lpr$ mouse but not the MRL normal (Hewicker 1990). Onset and severity of symptoms associated with the Fas$^{lpr}$ gene is strain-dependent. For example, lymphoproliferation varies greatly with congeneric strain C57BL/6-J-Fas$^{lpr}$/Fas$^{lpr}$ at a 24 fold increase over control lymph node weight, MRL/Mp-Fas$^{lpr}$/Fas$^{lpr}$ at 75 fold and congeneric strain C3H/HeJ-Fas$^{lpr}$/Fas$^{lpr}$ at 116 fold increase over control lymph node weight (Morse et al 1985). Variance in renal pathology ranks from extensive in MRL/Mp-Fas$^{lpr}$/Fas$^{lpr}$ at 4 to 7 months to negligible at 14 to 16 months in mice with C57BL/6J and C3H/HeJ backgrounds and homozygous for the Fas$^{lpr}$ (Kelley and Roths 1985). Spontaneous production of anti-dsDNA autoantibodies is likewise affected with percentage binding of radiolabeled dsDNA in Fas$^{lpr}$/Fas$^{lpr}$ mice varying from 5 percent on C57BL/6J to 26 percent on C3H/HeJ to as high as 49 percent on MRL/Mp (Izui et al 1984). Female MRL/Mp-Fas$^{lpr}$ mice die at an average age of 17 weeks of age and males at 22 weeks. This compares to between 42 and 52 weeks in females on the C57BL/6J or C3H/HeJ backgrounds and homozygous for the Fas$^{lpr}$ (Kelley and Roths 1985).
Mycobacterium leprae (Yogi et al., 1989).

Development

Control Suggestions

Selected References

Genetics

Fas<sup>lr</sup>

Disease/Phenotype

Disease Terms

Research Areas By Phenotype

Mammalian Phenotype Terms by Genotype

Phenotype Information

References

Technical Support

Genotyping Protocols
Standard PCR: Fas
Standard PCR: Fas MCA

Genotyping resources and troubleshooting

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

Breeding Considerations

This strain is a challenging 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. Mice may have only 2 litters before developing phenotype.

Additional Breeding and Husbandry Support

Mating System
Homozygote x Homozygote

Appearance
albino

Related Genotype: a/a Tyr<sup>r</sup>/Tyr<sup>r</sup>

Citation

When using the MRL-lpr mouse strain in a publication, please cite the originating article(s) and include JAX stock #000485 in your Materials and Methods sections.
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Domestic

Pricing effective for USA, Canada and Mexico shipping destinations

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