Also Known As: MT-PSX transgenic line 23-3

MT-PSX transgenic line 23-3 mice (also called Tg[MT-1,HBV]Bri28) have the zinc-inducible mouse metallothionein I promoter sequences directing expression of the envelope/surface antigen coding region (HBsAg) of the hepatitis B virus (HBV). This results in high serum HBsAg before zinc treatment, and hepatocellular retention of HBsAg following zinc treatment. These mice are a model for studying the impact of secreted HBsAg on induction of HBsAg-specific adaptive immune responses during infection or to therapeutic
vaccination. They are also useful in studying the immunopathogenesis of acute T cell mediated hepatitis, chronic T cell mediated hepatitis, and the downstream consequences of chronic hepatitis, especially hepatocellular carcinoma.

Donating Investigator
Dr. Francis (Frank) V Chisari, The Scripps Research Institute

GENETIC OVERVIEW

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<th>Genetic Background</th>
<th>Generation</th>
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<td>Tg(Mt1-HBV)28Bri</td>
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Allele Type
Transgenic (Inserted expressed sequence)

RESEARCH APPLICATIONS

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

BASE PRICE
Starting at:
$2,854.50 Domestic price Cryo Recovery

MT-PSX transgenic line 23-3 mice (also called Tg[MT-1,HBV]Bri28) have zinc-inducible expression of nontoxic quantities of the three hepatitis B virus envelope/surface antigen proteins (large, middle, and small; all containing hepatitis B surface antigen (HBsAg) determinants) in their hepatocytes, and are immunologically tolerant to HBsAg at the T cell level. Independent of zinc activation, these mice display no evidence of spontaneous liver disease nor hepatocellular carcinoma during their lifetime.
During the normal HBV replication cycle, the middle and small envelope proteins assemble to form the HBV major envelope polypeptide (a 22 nm spherical subviral particle containing HBsAg) that is rapidly-secreted by the hepatocyte into the circulation. However, the ability of the hepatocytes to secrete these HBsAg subviral particles is inversely proportional to the abundance of the large envelope protein which, when coexpressed with the middle and small envelope proteins, forms long non-secretable filamentous particles that accumulate in the endoplasmic reticulum (where they are readily detectable immunohistochemically), thus precluding secretion of the 22 nm spherical forms.

The MT-PSX transgene is designed to have the zinc-inducible mouse metallothionein I promoter sequences directing expression of the HBV large envelope protein, but expression of the middle and small envelope proteins are regulated by a constitutively active internal promoter located within the envelope coding region on the transgene. Therefore, in the absence of dietary zinc supplementation, expression of the middle and small envelope proteins, but not the large envelope protein, is observed; this results in high serum HBsAg levels and very low hepatocellular HBsAg levels (barely detectable immunohistochemically).

Activation of the metallothionein I promoter by oral zinc administration leads to expression of the large envelope polypeptide by the hepatocyte; this results in the formation and retention of the non-secretable filamentous HBsAg particle in the hepatocyte endoplasmic reticulum (where it is detectable principally as cytoplasmic HBsAg in periportal hepatocytes close to the point of entry of the circulation into the hepatic lobule) and gives the hepatocytes a "ground glass" appearance. This renders the hepatocytes highly susceptible to destruction (MHC class I-restricted necro-inflammatory liver disease) after immune system ablation with subsequent adoptive transfer of HBsAg-specific cytotoxic T lymphocytes (CTLs).

MT-PSX transgenic line 23-3 mice exhibit no detectable liver expression (RNA or protein) from the transgenic HBV X gene.

Hemizygous mice are viable, fertile and healthy. To date (July 2015), it has not been attempted to make this strain homozygous.

Importantly, the donating investigator confirms that the MT-PSX transgenic line 23-3 mice do not produce the infectious HBV particle (hepatitis B virion aka Dane particle), independent of zinc administration. This is because the MT-PSX transgene does not have the sequences encoding the viral DNA polymerase (P gene) or the HBV core protein (pre-C [HBeAg] and C gene [HBcAg]).
Genotyping Protocols
Standard PCR: Tg(Mt1-HBV)28Bri/Chi
Genotyping resources and troubleshooting

Breeding Considerations
When maintaining a live colony, hemizygous mice may be bred to wildtype (noncarrier) siblings or to C57BL/6J inbred mice (Stock No. 000664). To date (July 2015), it has not been attempted to make this strain homozygous.

Additional Breeding and Husbandry Support

Citation
When using the MT-PSX transgenic line 23-3 mouse strain in a publication, please cite the originating article(s) and include JAX stock #027527 in your Materials and Methods section.

Animal Health Reports
Production of mice from cryopreserved embryos or sperm occurs in a maximum barrier room, G200

Pricing & Availability

Cryo Recovery
Typically mice are recovered in 10-14 weeks. Contact Customer Service to place an order or for more information.

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<th>GENOTYPE</th>
<th>PRICE</th>
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<tr>
<td>Cryo Recovery</td>
<td>Hemizygous or Non Carrier for Tg(Mt1-HBV)28Bri</td>
<td>$2,854.50</td>
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We will fulfill your order by providing at least two carriers for each strain ordered. The total number, sex, and genotypes provided will vary, although typically 8 or more animals are provided. Please check genotypes which will be recovered. While the genotypes of all animals produced will be communicated to you prior to scheduling shipment, the genotypes of animals provided may not reflect the mating scheme and genotypes described in the strain description. Animals are typically ready to ship in 11-14 weeks. If a second recovery is required to produce the minimum number of animals, then delivery time would increase to approximately 25 weeks. If we fail to produce animals of the correct genotype, you will not be charged. We cannot guarantee the reproductive success of mice shipped to your facility. If the mice are lost after the first three days (post-arrival) or do not produce progeny at your facility, a new order and fee will be necessary.

Cryorecovery to establish a Dedicated Supply for greater quantities of mice. Mice recovered can be used to establish a dedicated colony to contractually supply you mice according to your requirements. Price by quotation.

Related Products and Services
Frozen Mouse Embryo B6;SJL-Tg(Mt1-HBV)28Bri/ChiJ Frozen Embryo $2595.00
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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.

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All Related Strains