ENVIGO

Genetically engineered models (GEMS)

Mdr1a-1b knockout rat

Model	Mdr1a-1b knockout rat
Strain	HsdSage: SD -*Mdr1a*^{tm1Sage}*Mdr1b*^{tm1Sage}
Location	U.S.
Availability	Live colony

Characteristics/husbandry

+ Background strain: Sprague Dawley
+ Mdr1a (Abcba1) and Mdr1b (Abc1b) have both been knocked out as a large deletion

Zygosity genotype

+ Homozygous

Research use

+ DMPK assay
+ PK-PD efflux assay
+ Neurotoxicology
+ Formulation drug-drug interactions
+ Drug resistance
+ Blood brain barrier efflux
+ Efficacy

Origin

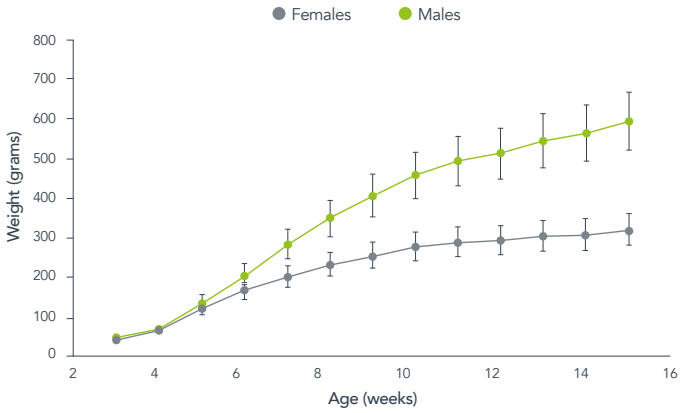
The Mdr1a-1b KO rat model was originally created at SAGE Labs, Inc. in St. Louis, MO and distributed out of the Boyertown, PA facility. The line continues to be maintained through the original SAGE Labs animal inventory acquired by Envigo.

Description

P-glycoprotein plays a critical role in efflux for both brain and liver. Homozygous null Mdr1a rats display increased exposure to CNS drugs in the brain, as well as increased bioavailability in the plasma for P-gp-specific substrates.

MDR1 encodes for P-glycoprotein and is a membrane-bound drug transporter expressed in the brain and intestine. It effectively blocks drugs from crossing the blood-brain barrier. P-gp can confer multiple drug resistance to tumor cells. Absence of P-gp creates a functional deficiency in the blood-brain barrier and results in elevated drug levels in many tissues, making this a useful model for efflux assay, efficacy, formulation, tissue distribution, studying neurotoxicology and chemotherapeutic agents.

Figure 1: A graph showing the correlation between the age and weight of Mdr1a-1b knockout rats.



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