inotiv
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Genetically engineered models **(GEMS)**

Mdr1a – Bcrp knockout rat

MODEL	Mdr1a - Bcrp knockout rat
STRAIN	HsdSage: SD-*Mdr1a*^{em1Sage} *Abcg2*^{em1Sage}
LOCATION	U.S.
AVAILABILITY	Live colony

CHARACTERISTICS/HUSBANDRY

- Biallelic 20 bp deletion within Abcba1 gene and 588 bp deletion within the Abcg2 gene
- Increased oral bioavailability of P-gp and Bcrp specific substrates
- Homozygous knockout rats display total loss of both proteins via Western blot
- Background strain: Sprague-Dawley

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 - Bcrp knockout rat model was originally created at SAGE Labs, Inc. in St. Louis, MO. The animal inventory was acquired by Envigo in 2019 and then by Inotiv in 2021. The line continues to be maintained through the original SAGE Labs animal inventory and is distributed out of the Boyertown, PA facility.

DESCRIPTION

P-gp and Bcrp both play a critical role in efflux for the brain. Double homozygous null Mdr1a-Bcrp rats display increased exposure to CNS drugs in the brain, as well as increased bioavailability in the plasma or P-gp and Bcrp specific substrates.

MDR1 and Bcrp are membrane-bound drug transporters expressed in the brain. Each effectively blocks specific drugs from crossing the blood-brain barrier. P-gp and Bcrp can confer multiple drug resistance to tumor cells. Absence of P-gp and Bcrp 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.

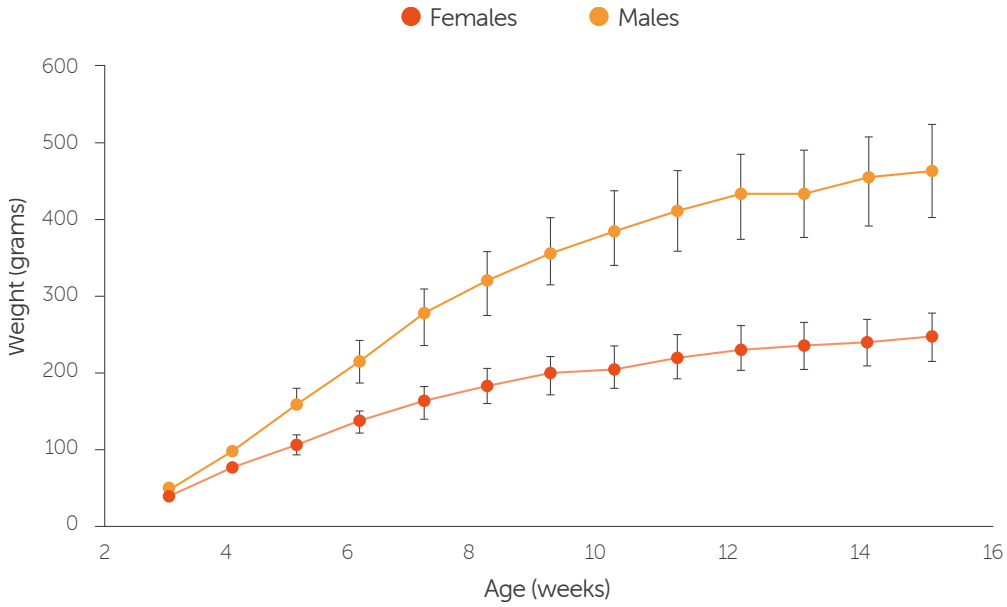

Figure 1: *A graph showing the correlation between the age and weight of Mdr1a - Bcrp knockout rats.*

CITATIONS

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