inotiv
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Genetically engineered models (GEMS)

Pink1 knockout rat – Park6

MODEL	Pink1 knockout rat - Park6
STRAIN	HsdSage: LE-*Pink1*^{em1Sage}
LOCATION	U.S.
AVAILABILITY	Live colony

CHARACTERISTICS/HUSBANDRY

- Homozygous knockout rats exhibit complete loss of target protein
- Approximately 30% of Pink1 knockout rats display a hindlimb-dragging phenotype at 5 months of age
- Pink1 knockout rats show increased hindlimb fatigue at 7 weeks of age
- Pink1 knockout rats show increased number of hindlimb foot slips at 5 and 9 weeks of age as assessed by tapered balance beam
- Preliminary reports have suggested Pink1 knockout rats show a ~50% reduction in dopaminergic neurons in the substantia nigra at 8 months of age
- Background strain: Long Evans Hooded

ZYGOSITY GENOTYPE

- Homozygous

RESEARCH USE

- Parkinson's disease
- Stress-induced neurological dysfunction

ORIGIN

The Pink1 (Park6) 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

Developed in collaboration with The Michael J. Fox Foundation, this model contains a deletion of the Pink1 (PTEN-induced putative kinase 1) gene, encoding for a serine/threonine protein kinase. Mutations in Pink1 are implicated in early-onset Parkinson's disease. Pink1 knockout rats show both motor impairments and dopaminergic cell loss, making this a useful model of Parkinson's disease.

Pink1 protein kinase localizes to the mitochondria and is thought to protect cells from stress-induced mitochondrial dysfunction. Mutations within this gene result in one form of autosomal recessive early-onset Parkinson's.

In humans, loss of function of Park7 leads to a form of early-onset Parkinson's disease. This occurs due to the role Park7 plays in protecting neurons from oxidative stress and cell death, making this an ideal model for the study of Parkinson's disease.

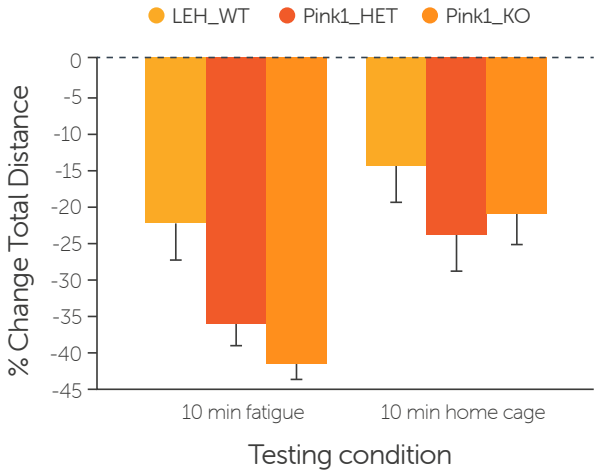

***Figure 1:** Increased fatigue in Pink1 knockout rats. Pink1 homozygous (Pink1_KO) and heterozygous (Pink1_HET) knockout rats display decreased movement compared to wild type animals (LEH_WT) in an open field after hindlimb fatigue challenge, indicative of increased hindlimb fatigue.*

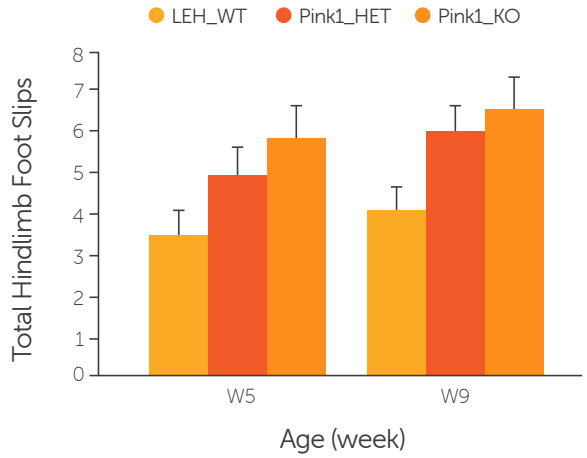

Figure 2: Decreased performance on tapered balance beam in Pink1 knockout rats. Pink1 homozygous (Pink1_KO) and heterozygous (Pink1_HET) knockout rats display increased hindlimb foot slips on a tapered balance beam compared to wild type animals (LEH_WT). No differences were seen in forelimb foot slips.

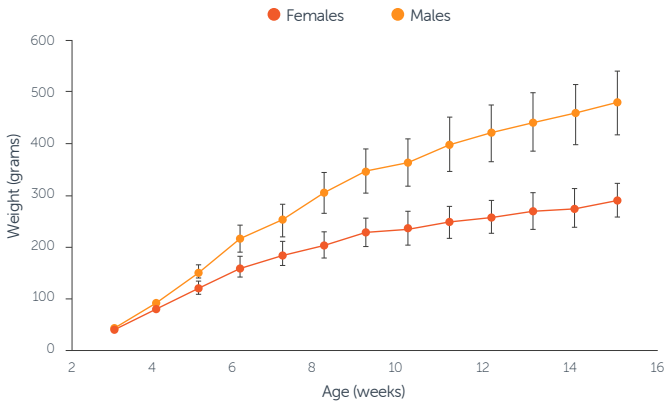

Figure 3: A graph showing the correlation between the age and weight of Pink1 knockout rats.

CITATIONS

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