Overview

Also Known As: anorexia

These mice carry the spontaneous *anx* mutation characterized by reduction in body weight, emaciated appearance, and abnormal behavior including head weaving and body tremors, uncoordinated gait, hyperactivity, and poor appetite.

GENETIC OVERVIEW

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<th>Genetic Background</th>
<th>Generation</th>
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<tr>
<td><em>anx</em></td>
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<tr>
<th>Allele Type</th>
<th>Gene Symbol</th>
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Compared with their wildtype siblings, anx/anx homozygotes are characterized by a thinning in the neck and tail at 5 days of age, lower body weight detectable by 9 days of age, and death by 22 days of age on the B6C3H-a/a background. Outbreeding to CAST/Ei modifies the phenotype such that homozygotes live to approximately 5 weeks of age. Evaluation of stomach content shows that anx/anx mice ingest less than their siblings. They show headweaving, body tremors, uncoordinated gait, and hyperactivity along with diminished adipose tissue and reduced serum leptin levels. (Maltais et al., 1984; Johansen et al., 2000)

Intraperitoneal injection of 20 day old pups with 5,7-dihydroxytryptamine, a serotonin antagonist, reduces the severity of the neurological phenotypes. Homozygotes have extensive serotonergic hyperinnervation in normal target fields including the hippocampus, frontal cortex, olfactory bulb, and cerebellum, yet they have normal catecholaminergic innervation. This hyperinnervation is thought to reflect increased arborization of axonal fibers since there is no increase in serotonergic cell bodies. In the raphe nuclei, there are decreased mRNA levels of serotonin transporter (Slc6a4 previously Htt or 5-Htt) and tryptophan hydroxylase activity is diminished. Similar to food deprived wild type mice, anx/anx mice show decreased mRNA of monoamine oxidase A in the locus ceruleus but not the raphe nuclei. (Maltais et al., 1984; Son et al., 1994; Jahng et al., 1998; Brain Res; Jahng et al., 1998, Dev Brain Res.)

Despite their failure to eat adequately, homozygotes do not show elevated neuropeptide Y mRNA levels in the hypothalamic arcuate nucleus. However, immunohistochemistry revealed increased perikaryal neuropeptide Y staining in the arcuate nucleus and decreased density and neuropeptide Y staining of neuropeptide Y terminals in the paraventricular, arcuate, and other hypothalamic nuclei. Neuropeptide Y staining in the suprachiasmatic and thalamic paraventricular nuclei is normal. There is a similarly altered pattern of expression for agouti gene-related protein with immunoreactivity increased in the cell body and decreased in the terminals in arcuate neurons despite apparently normal mRNA levels. (Broberger et al., 1997; Jahng et al., 1998, Brain Res; Broberger et al.,...
The arcuate nucleus also has a reduction in the number of pro-opiomelanocortin expressing neurons, a reduction in mRNA levels of pro-opiomelanocortin and neuropeptide Y receptors Y1 and Y5, and a reduction in immunoreactivity of neuropeptide Y receptor Y2, adrenocorticotropic hormone, and alpha melanocyte stimulating hormone. Decreased staining of aspartate, acetylcholinesterase, and somatostatin was also seen in the arcuate nucleus. Decreased staining of cocaine and amphetamine regulated transcript in the arcuate nucleus and other regions of the hypothalamus has also been reported. This pattern of decreased staining of pro-opiomelanocortin neurons may be due to degeneration of this cell population. No changes in brain cholecystokinin, galanin, or serotonin were detected by immunohistochemistry. (Broberger et al., 1997; Broberger et al., 1999; Johansen et al., 2000.)

The dentate gyrus of anx/anx mice is smaller than normal and has an increase in both the number of proliferating cells and cells undergoing apoptosis according to BrdU and TUNEL assessment. (Kim et al., 2001.)
Appearance
black, affected
Related Genotype: a anx/a anx

black, unaffected
Related Genotype: a ?/a +

Citation
When using the anorexia mouse strain in a publication, please cite the originating article(s) and include JAX stock #000624 in your Materials and Methods section.

Facility Barrier Level Descriptions
Production of mice from cryopreserved embryos or sperm occurs in a maximum barrier room, G200

Pricing & Availability

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<td>Progeny testing required but not provided. No genotyping assay is available for these recessive cryo-recovered animals of undefined genotype</td>
<td>$2,854.50</td>
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