DBA/2

DBA/2NHsd, DBA/2OlaHsd, DBA/2JRccHsd

Developed in 1909 by Little from mice used in color experiments and this strain is the oldest of all inbred strains of mice. In 1929-30, crosses were made between sub-lines, and several new lines established; two of these were called 12 (now DBA/1) and 212 (now DBA/2).

DBA/2NHsd

In 1951, from Mider to the National Institutes of Health (NIH), Bethesda, Maryland, USA. Harlan obtained a breeding nucleus from NIH. Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021.

DBA/2OlaHsd

Obtained by Laboratory Animals Centre, Carshalton from the Jackson Laboratory, Bar Harbor in 1959. In 1972, to OLAC (now Inotiv). Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021.

DBA/2JRccHsd

The DBA/2JRccHsd mice originate from Jackson Laboratory, Bar Harbor, Maine and were moved in 1974 to RCC Ltd. (formerly IBM and BRL) in Füllinsdorf, Switzerland. To Harlan Laboratories through acquisition in 2004. Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021.

RESEARCH APPLICATIONS

Coat color, behavior, audiogenic seizures, epilepsy, calcification, metabolism, fetal resorption, immunology, infectious diseases, etc.

CHARACTERISTICS

Anatomy


Behavior


DBA/2 mice failed to react to a spatial change of objects in an open field, and therefore resemble rats with dorsal lesions of the hippocampus. They may represent a model of hippocampal dysfunction (Ammassari-Teule et al, 1995). Feed restriction for nine days causes a high incidence of stereotypic cage cover climbing (contrast C57BL/6) (Cabb and Bonaventira, 1997).
Drugs


Less susceptible to the development of micronuclei than BALB/c following treatment with clastogenic base analogues and nucleosides (Sato et al., 1993). Unique poor responsiveness to the antinociceptive effects of nitrous oxide, a polygenic trait (Quock et al., 1996). Nine-fold lower ED50 for haloperidol-induced catalepsy than C57BL/6, but this is not associated with numbers of cholinergic neurons (Dains et al., 1996). Airways hyperreactive to acetylcholine (Zhang et al., 1995). Resistant to rate-depressant effects of ethanol on schedule-controlled behavior (Elmer and George, 1995). Low voluntary consumption of morphine in two-bottle choice situation (Belknap et al., 1993). Low voluntary consumption of morphine in two-bottle choice situation (Belknap et al., 1993). Low voluntary consumption of morphine in two-bottle choice situation (Belknap et al., 1993).

Genetics

Coat color genes
- a, b, C, d : non-agouti, dilute brown.

Histocompatibility
- H-2a, Thy-1b.

Biochemical markers
- Apoa-1®, Car-2®, Es-1®, Es-2®, Es-3®, Gpd-1®, Gpi-1®, Hba1, Hbb1, Idh-1®, Ldh-1®, Mod-1®, Mup-1®, Pep-3®, Pgm-1®, Pgm-2®, Tf®.

Although the DBA/1 and DBA/2 are substrains of the DBA there are differences between these strains, probably due to a substantial residual heterozygosity following the crosses between the substrains. DBA/1 and DBA/2 differ at least at the following loci: Car-2, Ce-2, Hc, H-2, If-1, Lsh, Tla, and Qa-3. With such large differences, they should probably be regarded as different strains rather than substrains of the same strain. This strain carries the Mus musculus musculus Y-chromosome, while others have the M. m. domesticus type (Nishioka, 1987).

Immunology


**Infection**


**Life-span and spontaneous disease**

Primary lung tumors 1% in males, 2% in females. Lymphatic leukemia zero in males, 2% in females and 3% in virgin females. Mammary adenocarcinomas in unfostered substrains 1% in males, 72% in breeding females and 48% in virgin females (Hoag, 1963). A high proportion of mammary tumors are of the acinar type (Tengbergen, 1970). Overall tumor incidence 15% in males, 49% in females, including lymphomas 10% in males and 12% in females; mammary tumors zero in males and 31% in virgin females (Smith et al, 1973). Leukemia 3% (Myers et al, 1970). Long life-span in SPF fostered conditions (629 days in males, 719 days in females) with 6-35% liver and 1-23% lung tumors (Festing and Blackmore, 1971). Long life-span in conventional conditions (707 days in males, 714 days in females) (Storer, 1966). Life-span 722 days in males and 683 days in females (Goodrick, 1975). High incidence of expression of RNA tumor virus group-specific antigen (Diwan et al, 1973). Type B reticulum cell neoplasms 18% at about 20 weeks (Dunn and Deringer, 1968). Spontaneous calcified heart lesions progress with age. 90% of individuals affected by one year (Rings and Wagner, 1971). Incidence of calcareous heart lesions high among some related strains (Di Paola et al, 1964). Dystrophic cardiac calcification may be related to disturbed myocyte calcium metabolism (Brunnert, 1997). Chronic hypertrophic gastritis, duodenal polyps and calcareous periarticulari frequently observed. Other lesions include malignant lymphoma and degenerative processes in the myocardium, skeletal muscle, subcutaneous adipose tissue, cornea and blood vessels. Lesions partly depend on diet (Hare and Stewart, 1956). Carry three separate recessive genes similar to those found separately in C57BL/6J, BALB/cBy and WB/ReJ, causing age-related hearing loss (Willo1t et al, 1995).

**Miscellaneous**

Recommended host for the following transplantable tumors: fibrosarcoma SaD2, lymphatic leukemia P1534 and mammary adenocarcinoma Cd2 (Kaliss, 1972). Hybrids involving DBA/2 are recommended host for transplantable leukemia L1210, melanoma S91 and MOPC myeloma used as models in screening potential anticancer drugs (EORTC Screening Group, 1972). The Fv2+ allele appears to be lethal on the DBA/2 genetic background (Blank and Lilly, 1976). High mortality after neonatal thymectomy (Law, 1966). The relationship of genotype, sex, body weight, and growth parameters to lifespan in inbred and hybrid mice is described by Ingram et al (1982). Characteristics of the DBA/2 strain have been described by Festing (1997) and Lyon et al, (1996).

**Physiology and biochemistry**


Reproduction
The DBA/2 strain has a poor breeding performance and the young mice are very small at time of weaning. Colony output 0.85 young/female/week. Low litter size at weaning of 4.7 (Festing, 1976). Poor breeding performance. Litter size 4.2, sterility 31% (Nagasawa et al, 1973). Intermediate breeding performance (Hansen et al, 1973). Corpora lutea may persist over many cycles, becoming hyalinized and calcified (Chai and Dickie, 1966). Has shorter and less regular estrus cycles than C57BL/6J (Nelson et al, 1992). Susceptible to fetal resorption resulting from restraint-induced stress when mated to C3H/HeJ males, in contrast with CBA/J and A/J. This was reduced by alloimmunization with C3H cells (Clark et al, 1993).
REFERENCES


natives. Lipids 28, 599-605.
Nagasawa H, Miyamoto M, Fujimoto M (1973) Reproductivity in inbred.
strains of mice and project for their efficient production. Exp. Animals.
Galan 22, 115-126.
difficulty in development. J. Heredity. 78, 53-56.
on estrous cyclicity in mice: evidence that cycle length and frequency.
Vesal B (1968) Factors altering the responsiveness of mice to hexobarbital. Pharmacology 5, 7-14.