ENVIGO

Research Models and Services

Inbred Rats

WKY (Wistar Kyoto)

Origin

National Institutes of Health in 1971 from outbred Wistar stock obtained from Kyoto School of Medicine. Inbred as a normotensive control strain for SHR (Hansen et al 1973), though there is some controversy about the validity of such use (Rapp, 1987). Johnson et al (1992) found large genetic differences using restriction fragment length polymorphisms between WKY and SHR, comparable to the maximum divergence possible between unrelated humans. Also, breeding stock of the strain was distributed before F20, possibly resulting in the emergence of a number of strains or substrains (Kurtz and Morris, 1987; Kurtz *et al*, 1989). It is therefore essential that subline codes are always used in designating this strain.

WKY/NHsd

Harlan obtained a breeding nucleus from National Institutes of Health. Harlan became Envigo in 2015.

Characteristics

Anatomy

Low ten week body weight in males (Tanase *et al*, 1982).

Behavior

Sensitive to the induction of ulcers by stress (Pare, 1989). Hyperresponsive to a novel environment as indicated by delay in entering the open field, increased grooming, reduced rearing, and reduced locomotion (Tizabi *et al*, 1992).

Drugs

Resistant to the induction of glandular stomach adenocarcinomas following treatment with catechol (contrast LEW, Wistar and Sprague Dawley) (Tanaka *et al*, 1995).

Genetics

Coat color genes - *a, B, c, h* : albino

Immunology

Relatively sensitive to the induction of experimental autoimmune glomerulonephritis (Sado *et al*, 1986). Epitope specificities of collagen-induced arthritis studied by Cremer *et al* (1992).

Life-span and spontaneous disease

WKY rats have a much shorter median lifespan (21.5 months) compared to BN rats (31 months) (Gilad and Gilad, 1987). Resistant to the development of mammary carcinomas (both spontaneous and induced) due to a suppressor gene, which appears to be similar or identical to that carried by strain COP. However, WKY also carries one or more susceptibility genes (Haag *et al*, 1992).

Miscellaneous

Characteristics of the WKY strain have been described by Festing (1979) and Greenhouse *et al* (1990).

Physiology and biochemistry

Some demonstrate heritable biventricular cardiac hypertrophy, providing a model of volume-load hypertrophy (Pfeffer *et al*, 1979). Similarly, Kuribayashi *et al*, (1988) found a high incidence of a range of cardiac abnormalities in WKY/NCrj substrain rats. Belledonne *et al* (1979) showed that WKY/Tac rats are sensitive to sodium chloride-induced hypertension and have abnormal acid and ammonium excretion. Plasma ACTH levels were found to be 67% higher than in BN rats, with an inverse correlation with longevity (Tizabi *et al*, 1992; Gilad *et al*, 1993). Compared to SHR/N, ACI and F344/N, WKY has low levels of cytochrome Cyp2C11, but relatively high levels of S-warfarin 4-and 8-hydroxylase activities (Kitareewan and Walz, 1994).

Reproduction

Moderate reproductive performance.

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