ENVIGO

Research Models and Services

Inbred Rats

SS

Origin

John P. Rapp, Medical College, Ohio, from a colony developed by LK Dahl, Brookhaven National Laboratories, Upton, New York, who produced, a colony of rats sensitive to sodium chloride-induced hypertension by selection from outbred Sprague Dawley stock (Dahl *et al*, 1962).

SS/JrHsd

From Medical College to Harlan Laboratories in 1986. Harlan became Envigo in 2015.

Characteristics

Fulminant hypertension and marked vascular and renal lesions develop after three-four weeks on a high salt (8% NaCl) diet, and all die within eight weeks (Rapp and Dene, 1985), though on a low (0.3% NaCl) salt diet they survive well though they all develop marked hypertension, but with a slower rise in blood pressure. A high sucrose (52%) diet also leads to elevation of blood pressure, which is more rapid in SS than in SR or F344 rats (Preuss *et al*, 1992). Levels of IgG but not IgM or IgA are decreased in young pre-hypertensive rats compared with SR, and renal dysfunction is manifested by increased excretion of high molecular weight proteins including albumin and immunoglobulins (Cowen *et al*, 1991). Blood pressure is also increased by dietary potassium (Rapp, 1984). Kidney transplantation experiments between SS and SR rats suggest that part of the sensitivity is due to the kidney, and SS rats have 15% fewer glomeruli than SR rats (Rapp, 1984). The inheritance of salt-dependent hypertension has been studied in crosses with SR by Abbot and Schachter (1994). SS rats develop a high frequency of cataracts, which may be associated with blood pressure response to sodium chloride (Estape *et al*, 1995).

Characteristics of the SS strain have been described by Greenhouse *et al* (1990).

Genetics

Coat color genes - *c* : albino.

Stlezin *et al* (1992) found that SS and SR had about 80% of DNA fingerprint bands in common.

Reproduction

Produces one litter of about 8 pups, but second litter smaller because of hypertension.

References

1. Abbot RE and Schachter D (1994) Inheritance of salt-dependent hypertension in the inbred Dahl rat. Hypertension 24, 506-511.
2. Adams N and Blizard DA (1991) Genetic and maternal influences in rat models of spontaneous and salt-induced hypertension. Development Psychobiology. 24, 507-519.
3. Blizard DA and Adams N (1992) Maternal influences on cardiovascular pathophysiology. Experientia 48, 334-345.
4. Cowen IA, Harold MR, Chen CM, Abbott RE and Schachter D (1991) Immunoglobulin and renal abnormalities in Dahl genetically hypertensive rat. Am. J. Physiol. 261, H1595-H1902.
5. Dahl LK, Heine M and Tassinari L (1962) Effects of chronic excess salt ingestion. Evidence that genetic factors play an important role in susceptibility to experimental hypertension. J. Exp. Med. 115. 1173-1190.
6. Dahl LK, Heine M and Tassinari L (1962) Role of genetic factors in susceptibility to experimental hypertension due to chronic excess salt ingestion. Nature 194. 480-482.
7. Estape ES, Rodriguezargent C, Cangiano JL and Candia OA (1995) Increased dietary NaCl intake influences lens transport-properties in Sprague-Dawley rats. Current Eye Research 14, 159-162.
8. Greenhouse DD, Festing MFW, Hasan S and Cohen AL (1990) Catalogue of inbred strains of rats. In: Genetic monitoring of inbred strains of rats (Hedrich HJ, ed). Stuttgart, New York: Gustav Fischer Verlag, pp. 410-480.
9. Johnson ML, Ely DL and Turner ME (1992) Genetic-divergence between the Wistar-Kyoto rat and the Spontaneously Hypertensive Rat. Hypertension 19, 425-427.
10. Onwochei MO, Snajdar RM and Rapp JP (1987) Release of atrial natriuretic factor from heart-lung preparations of inbred Dahl rats. Am. J. Physiol. 253, H1044-H1052.
11. Preuss HG, Knapka JJ, Macarthy P, Yousufi AK, Sabnis SG and Antonovytch TT (1992) High sucrose diets increase blood-pressure of both salt-sensitive and salt-resistance rats AJH 5, 585-591.
12. Rapp JP (1984) Characteristics of Dahl salt-susceptible and salt-resistant rats. In: Handbook of Hypertension. Experimental and genetic models of hypertension Vol. 4. (de Jong W, ed). Amsterdam, New York, Oxford: Elsevier, pp 287-295.
13. Rapp JP and Dene H (1985) Development and characteristics of inbred strains Dahl salt-sensitive and salt-resistant rats. Hypertension 7, 340-349.
14. Snajdar RM and Rapp JP (1985) Atrial natriuretic factor in Dahl rats. Atrial content and renal and aortic responses. Hypertension 7, 775-782.
15. Snajdar RM, Dene H and Rapp JP (1987) Partial characterisation of atrial natriuretic factor in the hearts of Dahl salt-sensitive and salt-resistant rats. Endocrinology 120, 2512-2520.
16. Stlezin E, Simonet L, Pravenec M and Kurtz TW (1992) Hypertensive strains and normotensive control rats – how closely are they related. Hypertension 19, 419-424.

Contact us

North America 800.793.7287 EU and Asia envigo.com/contactus info@envigo.com

Envigo RMS Division, 8520 Allison Pointe Blvd., Suite 400, Indianapolis, IN 46250, United States