NZW (New Zealand White)

Origin
Outbred mice from Imperial Cancer Research Fund, London, to University of Otago Medical School in 1930. Inbred by Bielschowsky in 1948. A number of other strains, including NZO, NZC, NZX and NZY, were developed from the same stock (Bielschowski and Goodall, 1970). Strain NZW was derived from the same outbred stock, but was inbred independently by Hall (Hall and Simpson, 1975).

NZW/OlaHsd
Hall, Otago University, New Zealand to Laboratory Animals Centre, Carshalton in 1964. To OLAC (now Envigo) in 1979.

Research applications
Autoimmunity

Characteristics
Strain widely used as the NZB x NZW F1 hybrid, giving a model of systemic lupus erythematosus. Syndrome includes typical lupus erythematosus cells, antinuclear antibody, hemolytic anemia, proteinuria with casts and terminal nephrosis with renal failure before 8 months (Milich and Gershwin, 1981). Incidence and severity of the disease is greater in females than males (Dubois et al, 1966).

Anatomy
High incidence of exencephaly reported by Vogelweid et al (1993). NZW mice are an additional model for studying the pathogenesis of neural tube defects (Vogelweid et al, 1993). High retinal ganglion cell number (Williams et al, 1996). The comparative study of the thymus in autoimmune and normal strains, revealed that important changes of the large medullary epithelial cells, involved in the formation of Hassall’s corpuscles, occur in NZB, NZW and (NZB x NZW)F1 mice (De Vries and Hijmans, 1967).

Behavior
High within-strain aggression. Litter mate males housed together often fight severely by six-eight weeks (original observation). This strain is very aggressive in the different aggressivity tests, compared with seven other strains (Jones et al, 1987). High balsa-wood gnawing activity (Fawdington and Festing, 1980).

Drugs

Genetics
Coat color genes - A, b, c, p : albino.
Histocompatibility - H-2r.
Biochemical markers - Apoa-1*, Es-1*, Es-2*, Gpi-1*, Hbb*, Pep-3*, Pgm-1*.

This strain carries the Mus musculus musculus Y-chromosome, while others have the M. m. domesticus type (Nishioka, 1987).

Immunology
Serum antinuclear factor found in 12% of animals (Barnes and Tuffrey, 1967). The TCR beta-chain locus of NZW mice carries an 8.8-kb deletion which encompasses the C beta 1, D beta 2, and all six J beta 2 gene segments Studies suggest that D beta 2 and J beta 2 gene segments are required to maintain a diverse T cell repertoire and that their deletion from the genome may confer a significant selective disadvantage in the wild (Woodland et al, 1990). Resistant to immunosuppression of contact hypersensitivity by ultraviolet B light (Noonan and Hoffman, 1994).
References

3. de Vries MJ, Hymans W (1968) Pathological changes of epithelial cells and autoimmune disease in NZB, NZW and (NZBxNZW)F1 mice. Immunology 12, 179-196.