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ENVIGO

Research Models  
and Services

Outbred Mice

## TO (Tuck-Ordinary)

### Origin

Stock originally developed prior to 1940 by Dr M. Theiler, State Serum Institute, Denmark, for studies of virus infections causing encephalomyelitis in mice. In 1953, to National Institute of Medical Research, Mill Hill. To Clinical Research Centre, Harrow in 1970.

### HsdOla:TO

From Clinical Research Centre, Harrow to OLAC (now Envigo) in 1979. Maintained as a closed colony since.

### Characteristics

This is a reasonable vigorous outbred stock, which may be used by those wanting to use an outbred stock, but who find that for some reason the MF1 mouse is not ideal.

### Anatomy

3,6 % Exencephaly at birth (Padmanabhan *et al*, 1994).

### Behavior

Males are very aggressive intraspecies and interspecies (Brain *et al*, 1978). Decrease of aggression after administration of alcohol, but less sensitive than in Swiss mice (Smoothy *et al*, 1983). Intermediate aggression in putative test of aggression, compared to seven different stocks and strains (Jones *et al*, 1987)

### Drugs

Retinoic acid-induced asymmetric craniofacial growth and cleft palate (Padmanabhan and Ahmad 1997). Aspirin is protecting against alcohol-induced neural tube defects (Padmanabhan *et al*, 1994). Sensitive to carcinogenesis by 15,16-dihydro-11-methylcyclopental(a)phenanthren-17-one (Abbott 1983; Abbott *et al*, 1981; Coombs *et al*, 1979; Coombs *et al*, 1980).

### Genetics

Coat color genes - c : albino

Other genes are variable (outbred stock).

### Husbandry

Preferences for sleeping and nesting materials have been described by Sherwin (1996; 1997).

### Infection

*Chlamydia trachomatis* is causing infertility in C3H mice but not in TO mice (Tuffrey *et al*, 1986). Resistant to *Onchocerca lienalis*, compared to other strains like CBA, C56Bl/10 and BALB.K (Folkard *et al*, 1995).

### Physiology and biochemistry

CBA mice exhibited their peak blood alcohol concentrations around 7pm and blood alcohol concentrations remained relatively high until 5am. Conversely, for the TO mice the peak blood alcohol concentrations were observed at 9am and dropped rapidly afterwards. (Jelic *et al*, 1998).

## References

1. Abbott PJ (1983) Strain-specific tumorigenesis in mouse skin induced by the carcinogen 15,16-dihydro-11-methylcyclopenta[a]phenanthren-17-one, and its relation to DNA adduct formation and persistence. *Cancer Res.* 43, 2261-2266.
2. Abbott PJ, Crew F (1981) Repair of DNA adducts of the carcinogen 15,16-dihydro-11-methylcyclopenta [a] phenanthren-17-one in mouse tissue and its relation to tumor induction. *Cancer Res.* 41, 4115-4120.
3. Abdulrazzaq YM, Bastaki SMA, Padmanabhan R (1997) Teratogenic effects of vigabatrin in the TO mouse fetuses. *Teratology* 55, 165-176.
4. Brain PF et al (1978) A comparison of "intermale fighting" in "standard opponent" test and attack directed towards locusts by "TO" strain mice: effects of simple experimental manipulation. *Anim. Behav.* 26, 723-737.
5. Coombs MM et al (1979) The carcinogenicity of 15,16-dihydro-11-methylcyclopenta[a] phenanthren-17-one. *J. Cancer* 40, 914-921.
6. Coombs MM, Bhatt TS, Kissonerghis AM, Vose CW (1980) Mutagenic and carcinogenic metabolites of the carcinogen 15,16-dihydro-11-methylcyclopenta[a]phenanthren-17-one. *Cancer Res.* 40, 882-886.
7. Folkard SG et al (1995) The effects of H2 and non-H2 genes on the survival of *Onchocerca lienalis* microfilariae in the mouse. *Parasite Immunol.* 17, 329-333.
8. Jelic P, Shih, M-F; Taberner PV (1998) Diurnal variation in plasma ethanol levels of TO and CBA mice on chronic ethanol drinking or ethanol liquid diet schedules. *Psychopharmacology* 138, 143-150.
9. Jones SE, Brain PF (1987) Performances of inbred and outbred laboratory mice in putative test of aggression. *Behav. Genet.* 17, 87-96.
10. Padmanabhan R, Ahmad I (1997) Retinoic acid-induced asymmetric craniofacial growth and cleft palate in the TO mouse fetus. *Reprod. Toxicol.* 11, 843-860.
11. Padmanabhan R, Pallot DJ (1995) Aspirin alcohol interaction in the production of cleft palate and limb formations in the TO mouse. *Teratology* 51, 404-417.
12. Padmanabhan R, Wasfi IA, Craigmyle MBL (1994) Effect of pre-treatment with aspirin on alcohol-induced neural tube defects in the TO mouse fetuses. *Drug Alcohol Depend.* 36, 175-186.
13. Sherwin CM (1996) Preferences of individually housed TO strain laboratory mice for loose substrate or tubes for sleeping. *Lab. Anim.* 30, 245-251.
14. Sherwin CM (1997) Observations on the prevalence of nest-building in non-breeding TO strain mice and their use of two nesting materials. *Lab. Anim.* 31, 125-132.
15. Smoothy R et al (1983) Effect of ethanol on behavior of aggressive mice from two different strains: a comparison of simple and complex behavioral assessments. *Pharm. Biochem. Behav.* 19, 645-653.
16. Tuffrey M, Falder P, Gale J, Quinn R, Taylor-Robinson D (1986) Infertility in mice infected genitally with a human strain of *Chlamydia trachomatis*. *J. Reprod. Fertil.* 78, 251-260.

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