Comments on Drosophila Strains

(1) mei-9[a] mei-41[D5] / FM7c; mwh[*]

This strain was established by Inoue of Mitsubishi Chemical Corporation as a tester strain for simultaneous screening of genotoxic, mutagenic and clastogenic activity of chemical compounds. This assay, referred to as a combined assay for the DNA repair test and the wing spot test (somatic mutation and recombination test), is suited for screening mutagenic/carcinogenic activity of chemical compounds [1), 2), 3)].

The strain carries two types of X chromosome. One is the DNA repair-defective X-chromosome (sc z[1] w[+(TE)] mei-9[a] mei-41[D5]) and the other is the X chromosome balancer (In(1)FM7 y[31D] sc[8] dm B / (hereafter designated as FM7 / mei-9 mei-41). The X chromosomal genes, mei-9[a] and mei-41[D5], are an excision-repair defective and a post-replication repair defective mutations, respectively. The third chromosome carries multiple wing hair (mwh[*]), a wing-cuticle marker which confers multiple wing hairs in a single cell. With regard to DNA repair capability, the stock consists of the following four types of flies:

- mei-9 mei-41 / mei-9 mei-41 females (DNA repair defective)
- FM7 / mei-9 mei-41 females (DNA repair proficient)
- mei-9 mei-41 / Y males (DNA repair defective)
- FM7 / Y males (DNA repair proficient)

In the combined assay, FM7 / mei-9 mei-41; mwh / mwh females are mated with wild-type males (mei-9+ mei-41+; mwh+ / mwh+) and the F1 larvae are treated with a test compound. The insecticide-resistant Oregon R(R) strain is mostly used in place of the wild-type males to increase the test sensitivity for screening mutagens/carcinogens which requires metabolic activation.

<References>

1) Inoue H., H. Baba, K. Awano and K. Yoshikawa (1995): Genotoxic effect of griseofulvin in somatic cells of *Drosophila melanogaster*, Mutation Research 343, 229-234

2) Graf, U., F.E. Würgler, A.J. Katz, H. Frei, H. Juon, C.B. Hall and P.G. Kale (1984): Somatic mutation and recombination test in *Drosophila melanogaster*, Environmental Mutagenesis, 6, 153-188

3) Fujikawa, K. (1993): Genotoxic potency in *Drosophila melanogaster* of selected aromatic amines and polycyclic aromatic hydrocarbons as assayed in the DNA repair test, Mutation Research, 290, 175-182

(2) Oregon R(R)

This strain was established by Merrell (Minneapolis, MN, USA) as an insecticide-resistant strain derived from an Oregon R line. Since 1952, this strain had been selected for DDT resistance[1),2)], and the surviving flies proved to carry the RI gene for insecticide resistance on the second(?) chromosome with increased capability of cytochrome P-450 dependent bioactivation of promutagens/procarcinogens. This strain is suited to increase the test sensitivity for Drosophila assays for detecting various mutagens/carcinogens which requires metabolic activation[3)].

<References>

(1) Dapkus, D. and D.J. Merrell (1977): Chromosomal analysis of DDT-resistance in a long-term selected population of *Drosophila melanogaster*, Genetics, 87, 685-697

(2) Hällström, I., A. Blanck and S. Atuma (1984): Genetic variation in cytochrome P-450 and xenobiotic metabolism in *Drosophila melanogaster*, Biochemical Pharmacology, 33, 13-20

(3) Frölich A. and F.E. Würgler (1989): New tester strain with improved bioactivation capacity for the Drosophila wing-spot test, Mutation Research, 216, 179-187