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The Somatic Mutation and Recombination Test (SMART) in *Drosophila melanogaster*

The Somatic Mutation and Recombination Test (SMART) was developed by Ulrich Graf (1984) and collaborators from the ETH, Zurich. Commonly known as the wing spot test, this genotoxic test uses the eukaryotic model *Drosophila melanogaster*. Virgin females from the flare and Oregon-flare strains are mated to mwh males, to carry out the standard (ST) and high bioactivation (HB) crosses, with basal and high cytochromes P450 (Cyp450s) levels, respectively. Based on the loss of heterozygosity, DNA damage can be expressed by point mutation, recombination, deletion and aneuploidy. Third instar larvae are chronically fed with moistened media with test solutions for treatments or co-treatments until imago emergence. Imagos are collected and stored in 70% EtOH. Clones of markers, named spots, are scored unbiased under the microscope at 40x, in the dorsal and ventral adult wing's layers. Each fly has a total of ~50,000 cells in each pair of wings, so reviewing about 60 individuals per treatment reaches a number close to ~3 million cells. The frequency of small, large or twin spots and the total spots frequency per treatment are compared pair-wise with controls or inversely, using the SMART computer software by Frei and Würgler (1988) based on the Kastenbaum–Bowman test ($p<0.05$). In order to avoid false positive or negative results the Mann–Whitney and Wilcoxon U-test ($a=b=0.05$, one sided) is used. The alteration of cell division in the larvae wings´ imaginal discs cells caused, are pair-wise compared with the controls mwh accumulated distribution clones using the Kolmogorov–Smirnov test according to Graf et al. (1984). In the Genetic Toxicology Laboratory of FES Iztacala-UNAM we have evaluated the triasulfuron herbicide; natural products or compounds such as broccoli, vitamin C, sulforaphane, caffeic acid, verbascoside and zaeralenone; also ethanol, acetone, hydrogen peroxide, lead acetate, lead nitrate and DMSO; some drugs as tamoxifen, metronidazole and new tripanocides synthesized by chemists at the UNAM.

Biography

Heres-Pulido M E is full time Professor in UNAM-Iztacala, biology's career and Master´s degree. She has published three articles in proceedings of international conferences, and 17 refereed journal articles, 9 of which are indexed. She has published academic material such assix books, three interactive CDs; is co-author of two manuals and have five chapters in specialized publications. She became member of the Genetics Mexican Society and the President in 2009-2011. She was founding member of the Ecological Training Centre Omeyocan AC (1991-2003) and President from 2001 to 2003. She was accredited in 2008-2010 in the field of bioethics by the Mexican National Academy of Bioethics AC and is a member of the Bioethics Committee of UNAM FESI. She began her career in the National Nuclear Energy Commission of 1970-1975 where she collaborated in human genetic diagnoses and is a Professor at UNAM-Iztacala from 1976 to date, where she was especially dedicated in teaching Genetics, Cell Biology and Ethics, also has had five academic-administrative positions. Currently she is Head of the Laboratory of Genetic Toxicology from the Biology Career. She received the "Juan Pablos" award from the National Association of Mexican Editorial Industry in 1995.

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