

## APPENDIX D

### Hybrid dysgenesis

P-elements are transposable elements present in the wild populations that carry:

- genes for transposase activity which cause the elements to move;
- repressor activity that prevents expression of transposase.

It had been shown that the repressor activity is maternally inherited indicating the involvement of cytoplasmic factors (Simmons *et al.*, 1990).

When P elements are mobilized they produce a syndrome of traits collectively known as hybrid dysgenesis (Kidwell *et al.*, 1977). These traits include temperature-dependent sterility, elevated rates of mutation, chromosome rearrangement, and recombination. They can be explained largely by genomic changes due to P element transposition and excision in developing germ cells. As the P element mobilization repression is a maternally inherited trait, the syndrome is usually seen only in the progeny of P element carrying males and laboratory females (that lack P elements). The reciprocal cross yields hybrids in which the dysgenic traits are much reduced, the maternally derived cytoplasm containing the factors inhibiting the P elements jump.