

3. If "1" is itself associated with an arrangement preventing crossing-over, then "C" in chromosome balancing is unnecessary. Example:

$Cl/lz^S \text{♀} \times lz^S \text{♂}$ is balanced stock, though lz^S here is in normally arranged chromosome instead of with dl-49 inversion.

4. Other genes like lz^S which do not kill or sterilize ♂ but only homozygous ♀, may be balanced also with ClB . Example:

$P_1 \quad ClB \text{♀} \times sn \text{♂}$ ($sn =$ singed; $sn \text{♂}$ fertile; $sn/sn \text{♀}$ sterile)

$F_1 \quad ClB/sn \text{♀} \times sn \text{♂}$ (balanced stock)

$F_2 \quad ClB/sn \text{♀}$ (fertile) $sn/sn \text{♀}$ (sterile) $ClB \text{♂}$ dies
 $sn \text{♂}$ fertile

5. Genes in class 4 also may be balanced against attached X's

$y/sn \text{♀}$ (3X's - sterile) $X \quad sn \text{♂}$ $y \text{♀}$ $sn \text{♂}$ no-X(dies)

Method 5 is inferior to others whenever ♀♀ with "1" may be required.

Methods 4 and 5 are inferior to 1 and 2 where "1" ♂ is hard to obtain or to breed.

Austin, Tex. laboratory Balancers Chromosome 1: ClB -
Good, except for
extreme ends.

$sc^8 \quad sn$ - good for chromosomes not crossing-over in the middle region (e.g. Translocations &c)

99b sn - Ditto.

dl-49 - Balances middle region.

In-Am - Balances right end (f-bb) (probably left as far as y)

Chromosome 2:

Cy - Balances all of chromosome; Crosses over but seldom.

Pm -

NS -

Chromosome 3:

CMe - Inversion in left arm

T2,3-C e - Translocation with inversions; balances all of chromosome except the ca region.

Dex - Double inversion including D ; balances middle of chromosome (all of chromosome except ru-h, & ca)

C3X - Balances most of chromosome, but crosses over too frequently.

C3c -

Payne -

Oliver, C. P. Balancers

X-chromosomes with genes which cause sterility

or poor viability in males and with which ClB cannot be used, can be balanced with the dl inversion (Muller's) that has connected with it the visible spectacle eye. The spectacle female is sterile. Only a small per cent of crossing-over occurs to the left of forked. If spectacle-forked males are used to balance, no or only occasional selection is required. Punch eye, dominant, is a useful balancer for inviable genes in the left arm of 3 except for a small amount near the left end. The viability of punch is good.