

F₂ ab² mr/Cy (balanced ♂♂; examine each to see that ab² mr is present)

F_n Continue mass cultures of each non-lethal line to F_n. Test ab² mr chromosome of one ♂ from each F_n culture by fly from tester balanced stock ab² L² mr/Cy as follows:

F_{n+1} Cy/ab² "n" mr ♂ X Cy/ab² L² mr ♀

F_{n+2} ab² "n" mr/Cy (breed ♂♂ and ♀♀; -balanced ♂ of "n" Look for "ab² mr" appearing F_{n+3} flies. If absent, "n" is lethal. If abnormal, "n" is a visible. If present and normal, no detectable mutation has occurred.

Muller, H.J. Accumulation of Mutations in Given Sex

1. In 1 of ♀: see "Cs,B" method above.

2. In 2 of ♂: by use of

"Blond", a mutual translocation of 1 and 2, viable when homozygous and containing a dominant marker, the Blond bristles. (Found by Burkart with Stern). Key: 1 carrying right end of 2 and deficient for left end of 1 = Bld-1L/2R. 2 carrying left end of 1 and deficient for right end of 2 = 2-2R/1L.

"all" = a series of 7 recessive markers scattered through 2.

P₁ Bld-1L/2R ; 2-2R/1L/Cy ♂ (many single; - ♂ cultures) X X ; Cy/"all" ♀

F₁ Bld-1L/2R ; 2-2R/1L/Cy (or "all") ♂ X X ; Cy/"all" ♀ (balanced ♂). One mass culture and line from each P₁ ♂. (other combinations die or are highly infertile; if in latter crossing-over occurs, it is revealed by genes of "all").

Preliminary test for preexisting lethals and visibles in each P₁ ♂, and final test for new mutants is made as follows:

P₁ and F_{n+1} Bld-1L/2R ; 2-2R/1L 1(?) / Cy ♂ (single ♂ from each F_n line) X sc v lx f bb / ClB, sc v / Y; S / Cy ♀ (virgin ♀♀ of "Curly Pat" stock)

F₁ and F_{n+2} Bld-1L/2R ; 2-2R/1L 1(?) / S (or Cy) ♂ (only ♂♂ which live) X Bld-1L/2R / ClB, sc v (or sc v lx f bb) ; 2-2R/1L 1(?) / Cy ♀

(Choose non-sc, non-v, Cy orthoploid ♀♀, need not be virgin).

F₂ and F_{n+2} Look for non-S, non-Cy ♀:

Bld-1L/2R / Bld-1L/2R ; 2-2R/1L 1(?) / 2-2R/1L 1(?)

If absent, lethal is present; if they are abnormal (except Blond character) visible is present.

3. In 2 of ♂ and 2 of ♀ simultaneously; also in two 2's which alternate between ♂ and ♀. (By use of "abrupt2", sterile in homozygous ♂, of "morula", sterile in homozygous ♀, and of "rotund", sterile in both; crossing-over to be prevented by use of homozygous C3G, or inversions in "ab² pr mr" chromosome.)

P₁ rn mr / ab² pr mr ♂ X ab² rn / ab² pr mr ♀

(single ♂ and ♀ in many individual cultures)

F₁ (and F₃₋₅ etc.) rn mr / ab² pr mr (♀ sterile; ♂ breeds)

rn mr / ab² rn (♂ and ♀ sterile) ab² pr mr / ab² pr mr (♂ and ♀ sterile) ab² pr mr / ab² rn (♂ sterile; ♀ breeds)

F₂₋₄₋₆ etc. rn mr/ab² pr mr (only ♂ breeds) rn mr/ab² rn (steril^a)
 ab² pr mr/ab² pr mr (sterile) ab² pr mr/ab² rn
 (only ♀ breeds)

Test for lethals and visibles in P₁ or F_n:

P₁ or F_{n+1} 1(?) rn mr/ab² 1(?) pr mr ♂ X¹ Cy,pr/s ♀
 (Same method used for testing ab² pr mr/ab² rn ♀)

F₁ or F_{n+2} (Mate Cy, non-pr together . (Mate Cy,pr together)
1(?) rn mr/Cy,pr ♂ and . ab² 1(?) pr mr/Cy,pr ♀

F₂ or F_{n+3} 1(?) rn mr/1(?) rn mr . ab² 1(?) pr mr/ab² 1(?)
 . pr mr

(Look for presence and . (Look for presence and
 normality of rn mr flies . normality of ab² pr mr
 in F₂ or F_{n+3} . flies in F₂ or F_{n+3} .

Stern, Curt Technique for
obtaining large numbers of
unfertilized females.

Following a request by the
 editors of DIS a description
 is furnished of a genetic
 method published in 1929,

.Zeitschr. Abstgsl. 51: 315-316. A stock of the following
 constitution is maintained (Pasadena, Cold Spring Harbor,
 Rochester and other laboratories): g² B XY' Y''/y Y''. The males
 thus possess the long arm of the Y-chromosome (Y') attached to
 the X-chromosome and a Y-fragment (Y'') consisting of the short
 Y-arm plus part of the long arm. Y' carries the factor (or
 complex) K₁, Y'' carries K₂, both of which have to be present
 to permit male fertility. The females have attached X-chromo-
 somes and the Y'' fragment. The stock keeps constant without
 selection.

1) In order to obtain unfertilized females with attached
 X-chromosomes virgin y Y'' females of the stock are mated to
 males from any normal stock. The F₁ females will be yy and
 the F₁ males XY''. If the P-individuals of such a culture have
 been removed before the hatching of the F₁, all males present
 will be XY'' and sterile. All F₁ females, in spite of the pre-
 sence of their brothers, will be unfertilized accordingly.

2) In order to obtain unfertilized females without attach-
 ed X-chromosomes, XY'Y'' males from the original stock are mated
 to virgin females from a normal stock (in order to exclude the
 accidental use of XXY females it is advisable to take short
 bristled females from a bobbed stock). The F₁ males being XY''
 will be sterile and the F₁ females (XXY') will be unfertilized
 again.

The original stock should occasionally be tested for the
 occurrence of the very rare cross-overs in the XY' Y'' males
 which lead to the reconstruction of a normal Y-chromosome.
 Test method: Mate in one bottle 1 female and 1 male from the
 stock and add females from a bobbed stock. Test the sons of
 the bobbed females for fertility. If sterile, continue the
 stock from the offspring of the test culture.