

Sperm: $sc^{j1} \underline{1j1}/del-24$: $sc^{j1} \underline{1j1}/Y$: $sc^{j1} \underline{1j1}$: $del-24/Y$: $del-24$: Y

Eggs
 F_2 $y/sc^{j1} \underline{1j1}/del-24$ ♀ (sterile) $Y/sc^{j1} \underline{1j1}/del-24$ ♂ (fertile)
 $y/sc^{j1} \underline{1j1}/Y$ ♀ (sterile) $Y/sc^{j1} \underline{1j1}/Y$ ♂ (dies)
 $y/sc^{j1} \underline{1j1}$ ♀ (sterile) $Y/sc^{j1} \underline{1j1}$ ♂ (dies)
 $y/del-24/Y$ ♀ (fertile) $Y/del-24/Y$ ♂ (dies)
 $y/del-24$ ♀ (fertile) $Y/del-24$ ♂ (dies)
 y/Y ♀ (fertile) Y/Y (dies)

Fertile F_2 ♀ bred with fertile F_2 ♂ give same classes as before; hence stock is now self-perpetuating.

Muller, H.J. Detection of Mutations

1. Visibles arising in X of ♂:
 (Cross ♂ to y/Y ♀ and examine sons)

P_1 y/Y ♀ X X/Y ♂ (donor)
 F_1 y/X ♀ (3X, sterile) y/Y ♀ X X/Y ♂ (examine) Y/Y (dies)
 2. Lethals and visibles arising in X of ♂ (ClB method)

Key: B = Bar eye; C = inversion preventing crossing-over;
 n = new mutant, lethal, or visible; sc v f and car are recessive markers.

P_1 sc v f car/Cl B, sc v ♀ X X/Y ♂ (donor)
 F_1 ClB, sc v/n? ♀ X sc v f car ♂ (breed in individual cultures)
 F_2 sc ClB v/sc v f car ♀ (discard) ClB, sc v/Y ♂ (dies)
 n?/sc v f car ♀ n?/Y ♂ (if lethal, die)

Let "n" represent possible newly arisen mutant gene (lethal or visible). No crossing-over in F_1 ♂ because of inversion. If there is no "n" in given culture, $+$ will appear. If there is a visible "n", all ♂♂ will manifest it. If there is a lethal "n", no ♂♂ will hatch (except occasional non-disjunctional sc v f car); this is determinable without etherization. If "n" proves to be present in a culture, make mass culture of F_2 n/sc v f car ♂ X brothers (visible), or, if "n" is lethal X sc v f car ♂; either way provides stock of "n" and count of F_3 ♂♂ shows locus of "n".

3. Visibles arising in X of ♀ are directly evident in sons.
 4. Lethals arising in X of ♀

lz - lozenge-spectacled eye, sterile in homozygous ♀

dl-49 - inversion, preventing crossing-over to left of garnet.

P_1 $+/+$ ♀ (donor) X dl-49, lz^s B/Y ♂
 Obtain virgin F_1 ♀♀ and breed in individual ♀ cultures to dl-49, B ♂♂ (cross by brothers would yield some F_2 ♂♂ by non-disjunction.) If 1 is present, no $+$ appear; determinable without etherization. (If 1 is to right of garnet, a few $+$ ♂♂ appear).

F_1 $1/dl-49$, lz^s B ♀ X dl-49, lz^s B/Y ♂
 F_2 $1/dl-49$, lz^s B ♀ $1/Y$ ♂ (dies) dl-49, lz^s B/dl-49, lz^s B ♀ (lz^s B ♀ sterile) dl-49, lz^s B/Y ♂

If 1 is present, F_2 provides balanced stock of it unless to right of garnet.

5. Detection of mutations in autosomes same as method for getting homozygous stock. Method there given may be split for use with 2 alone or 3 alone.