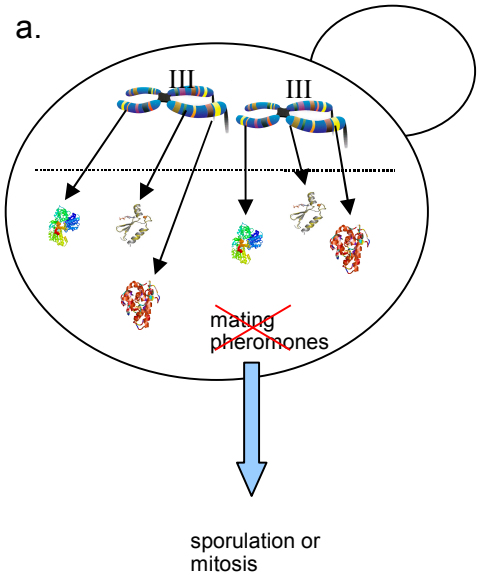
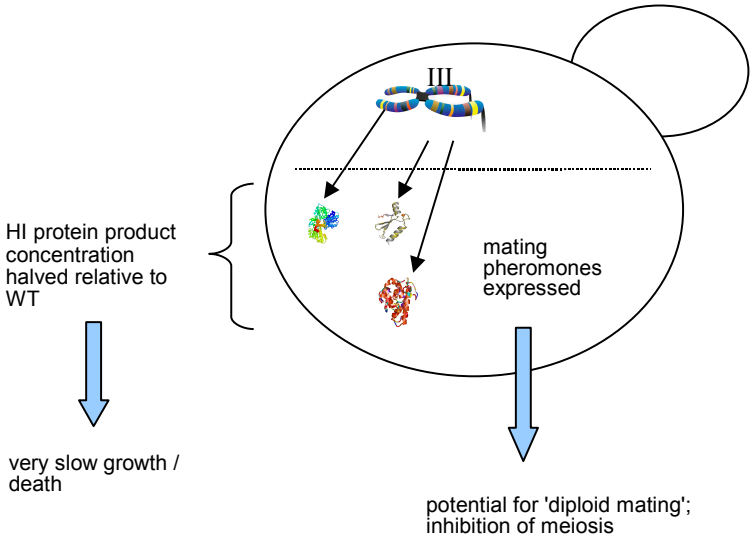
a.



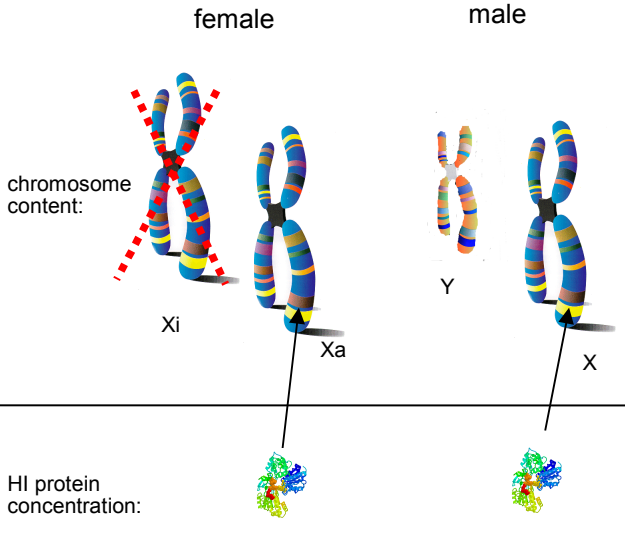

**Normal diploid cell:** both copies of HI gene present (one on each homologous chromosome)




**Loss of chromosome III:** only one copy of each Chr III HI gene present; cell fitness severely compromised

b.

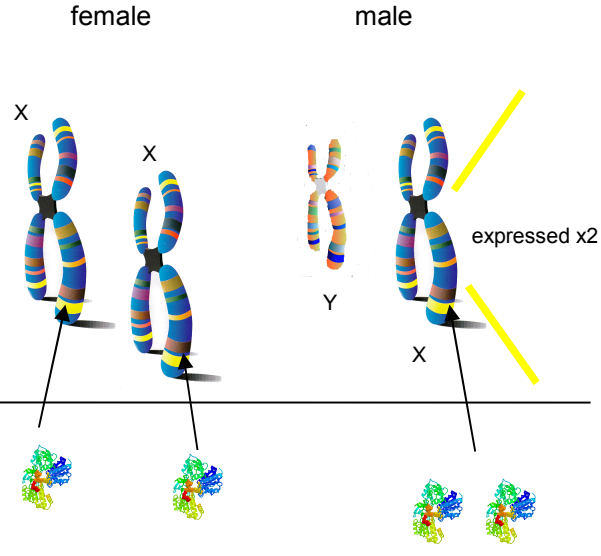
***Mammalian/C.elegans* sex chromosomes:** X-inactivation in females means that HI loci reduce fitness in both males and females




one copy of HI locus inactivated; fitness defect

single copy of HI locus only; fitness defect

***D. melanogaster* sex chromosomes:** alternative dosage compensation mechanisms mean X-linked HI genes do not reduce fitness in either sex




both copies of HI locus expressed; no fitness defect

single copy of HI locus doubly expressed; no fitness defect