

Mendel's experiments: Crossed pea plants; determined 9:3:3:1 ratios in dihybrid crosses

Conclusions: Two alleles for each trait; Alleles assort independently

Punnett and Bateson: Crossed pea plants; Dihybrid cross ratios differed from 9:3:3:1

Conclusions: Suggested that some traits were linked

Morgan: Used fruit flies to determine that linked traits are on the same chromosome

Conclusions: Genes cross over during meiosis; Chromosomes, not genes assort independently

Sturtevant's hypothesis: Frequency of cross-overs during meiosis related to distance between genes; The greater the distance, the greater the frequency of cross-overs

Sturtevant's experiments: Studied linked traits in fruit flies; Recorded the percentage of times crossing over occurred; Used cross-over frequencies to make linkage maps of genes

Making a linkage map: Cross-over frequency converted into map units; 1% cross-over is equivalent to 1 map unit; By knowing all cross-over frequencies of genes of interest, the relative locations of the genes can be determined; Not a map of physical distance between genes.