

GENETICS

Genetics is the study of a biological process (Heredity) where traits are passed from parents to offspring. The parents pass these traits through genes. A gene is a unit of heredity in living organisms. The traits transferred by these genes may be physical or not and some exhibiting diseases or disorders.

In pedigree showing inheritance of cystic fibrosis, the gene for the disorder is recessive. A recessive gene is one whose expression is masked by the presence of a dominant gene. The disorder manifests itself only when two individuals with a common cystic disorder allele meet. This satisfies the fact that the gene is recessive and only manifests to siblings whose parents have identical disorder allele though in recessive state.

Illustrating the information cystic fibrosis on a Punnett square, let small letter c stand for the recessive gene while capital letter C stand for the dominant non diseased gene. In males, the possibility of this disorder occurring is always a fourth generation for the siblings.

CC	Cc	cC	cc
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Disease 2

In this condition, the gene is recessive and linked to the X chromosome. In that case where a healthy X meets a defective x, the disease manifests. Males have only one x gene so when they receive the defective gene from their mother they get sick. B carries a defective x gene from the father and a healthy X gene from the mother, the recessive gene is suppressed by the dominant gene from the mother.

XY

xX

The role of the chromosomes in the above conditions is carrying the defective genes during crossover.



References

1. Dr. Ananya Mandal MD. (nd). Journal on genetics. Web March 30, 2014

