Lethal allele

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Outline

- Defination and Introduction
- History
- Types of lethal allele
- Example of lethal allele- Coat colour in mice

Introduction

- "*Allele which cause an organism to die is known as* ***lethal allele"***
- Certain genes are absolutely essential for survival. Mutation in these genes creates lethal allele
- Lethal alleles are **dominant** or **recessive**
- Fully dominant lethal allele kills organism in both homozygous and heterozygous condition
- Certain lethal alleles kills organisms in homozygous condition only.

History

- Lethal genes were first discovered by **Lucien Cuénot** while studying the inheritance of coat colour in mice.

- He expected a phenotype ratio from a cross of 3 yellow:1 white, but the observed ratio was 2:1.

- Allele was lethal in homozygous dominant condition

Types of lethal alleles

- Lethal alleles falls into four categories.

1. **Early onset-** lethal alleles which result in death of an organism at early stage of life for example during embryogenesis

2. **Late onset-** lethal allele which kills organism at their final stage of life are known as late onset allele

3. **Conditional-** lethal allele which kill organism under certain environmental conditions only.

e.g., temperature sensitive alleles kills organism at high temperature. But they don't kill any organism at low temperature.

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4. **Semi lethal** – Lethal allele which kill only some individuals of the population but not all are know as semi lethal.

Example

- Y gene in mouse. Y gene is responsible for yellow coat color in mouse. In recessive condition it produces white colour.
- Allele Y is lethal only when it present in homozygous dominant condition (YY).
- But this allele is not lethal in heterozygous dominant (Yy) and homozygous recessive (yy) condition

Example