

GE01S : Pedigree Analysis - 1

PEDIGREE ANALYSIS - 1

STANDARD SYMBOLS AND SAMPLE PEDIGREES

Standard symbols used in Pedigree Analysis

- Male (square)
- Female (circle)
- Unaffected individual (white)
- Affected individual (shaded)
- Carrier (circle with a dot)
- Normal allele (square with a dot)
- Abnormal allele (square with a dot)
- Individual with free ear lobe (square with a dot)
- Individual with attached ear lobe (square with a dot)
- Individual with normal blood out (square with a dot)
- Individual with sickle cell (square with a dot)
- Individual with tongue curler (square with a dot)
- Individual with non-tongue curler (square with a dot)
- Individual with hairy ear (square with a dot)
- Individual with non-hairy ear (square with a dot)
- Individual with normal eye (square with a dot)
- Individual with eye abnormality (square with a dot)

SAMPLE PEDIGREES

Pedigree 1 : Inheritance of an autosomal dominant trait

Pedigree 2 : Inheritance of an autosomal recessive trait

Pedigree 3 : Inheritance of an X-linked recessive trait

GE05S : Pedigree Analysis - 5

PEDIGREE ANALYSIS - 5

X-LINKED RECESSIVE INHERITANCE

- Affected males are born from carrier mothers.
- Carriers are often not mated and their status is not known.
- The child of an affected female is always a carrier.
- Only a 50% chance of being affected.
- There are affected males in all generations but none of the females are affected.

Pedigree of Hypophosphatemia

Pedigree of Deoxy Lactate

Legend:
 Affected individual (shaded)
 Normal individual (white)
 Carrier (circle with a dot)
 Affected allele (square with a dot)
 Normal allele (square with a dot)

GE02S : Pedigree Analysis - 2

PEDIGREE ANALYSIS - 2

MITOCHONDRIAL INHERITANCE

- All affected person must be a child of an affected person.
- Maternal inheritance only.
- Sexes are equal.
- There are affected males and females in all generations.
- Affected males and females are mated and their status is not known.
- There are affected males in all generations but none of the females are affected.

Mitochondrial Inheritance Pedigree

Tongue Curler Pedigree

Legend:
 Affected individual (shaded)
 Normal individual (white)
 Affected allele (square with a dot)
 Normal allele (square with a dot)

GE06S : Pedigree Analysis - 6

PEDIGREE ANALYSIS - 6

Y-LINKED TRAITS : HYPERTRICHOSIS

Mitochondrial Inheritance : Pedigree

Legend:
 Affected individual (shaded)
 Normal individual (white)
 Affected allele (square with a dot)
 Normal allele (square with a dot)

GE03S : Pedigree Analysis - 3

PEDIGREE ANALYSIS - 3

Autosomal Recessive Inheritance

- Affected people are usually born to unaffected parents.
- Parents of affected individual usually are heterozygous carriers.
- There are autosomal recessive parents.
- Affected males and females are mated and their status is not known.
- There are affected males in all generations but none of the females are affected.

Inheritance of Attached Ear Lobe

Inheritance of Sickle Cell Anemia

Legend:
 Affected individual (shaded)
 Normal individual (white)
 Affected allele (square with a dot)
 Normal allele (square with a dot)

GE07S : Homologous Organs Animals

HOMOLOGOUS ORGANS - ANIMALS

Comparative anatomy and morphology shows similarities in the pattern of bones of forelimbs of different vertebrates. Though these forelimbs perform different functions in these animals, they have similar anatomical structure. Hence, in these animals, the same structure developed along different directions resulting in divergent evolution. These structures are homologous and hence, common ancestry.

HUMAN FORELIMB

DOLPHIN FORELIMB

TURTLE FORELIMB

BIRD FORELIMB

BAT FORELIMB

HORSE FORELIMB

GE04S : Pedigree Analysis - 4

PEDIGREE ANALYSIS - 4

X-LINKED RECESSIVE INHERITANCE

- Affected males are born from carrier mothers.
- Carriers are often not mated and their status is not known.
- The child of an affected female is always a carrier.
- Only a 50% chance of being affected.
- There are affected males in all generations but none of the females are affected.

Haemophilia Pedigree

Colour Blindness Pedigree

Legend:
 Affected individual (shaded)
 Normal individual (white)
 Carrier (circle with a dot)
 Affected allele (square with a dot)
 Normal allele (square with a dot)

GE08S : Analogous Organs - Animals

ANALOGOUS ORGANS - ANIMALS

Wings of Birds, Butterfly, Bat and Pterosaur are not anatomically similar structures though they perform similar functions. They are the result of convergent evolution.

WINGS OF BAT

WINGS OF BIRD

WINGS OF BUTTERFLY

WINGS OF PTEROSAUR

