

## SEX-LINKED INHERITANCE

- ◆ This is a form of inheritance where the gene/allele for the characteristic being studied is on the \_\_\_\_\_ chromosome.
- ◆ Diseases such as **colour-blindness** and **haemophilia** are inherited this way, and are more common in \_\_\_\_\_ than females.

### HAEMOPHILIA

- ◆ Alleles, Genotypes and Phenotypes for Haemophilia (Blood-Clotting Inability)

$X_H$  – allele for normal blood clotting

$X_h$  – allele for haemophilia

$X_HX_H$  – genotype of normal female

$X_hX_h$  – genotype of haemophiliac female

$X_HX_h$  – genotype of carrier female (with normal blood-clotting ability, but who can pass the \_\_\_\_\_ gene to her children)

$X_HY$  – genotype of normal male

$X_hY$  – genotype of haemophiliac male

- ◆ Example 1 – Haemophilia

A man with normal blood-clotting ability ( $X_HY$ ) marries a woman who is a haemophiliac ( $X_hX_h$ ). The possible phenotypes of their children are ...

	$X_H$	$Y$
$X_h$	$X_HX_h$	$X_hY$
$X_h$	$X_HX_h$	$X_hY$

Possible genotypes = 1  $X_HX_h$  : 1  $X_hY$

Possible phenotypes

= 1 \_\_\_\_\_ female : 1 \_\_\_\_\_ male

- ◆ Example 2 – Haemophilia

A normal woman ( $X_HX_H$ ) marries a haemophiliac man ( $X_hY$ ). The possible genotypes and phenotypes of the children are...

	$X_H$	$X_H$
$X_h$	$X_HX_h$	$X_HX_h$
$Y$	$X_HY$	$X_HY$

Possible genotypes = 1  $X_HX_h$  : 1  $X_HY$

Possible phenotypes

= 1 \_\_\_\_\_ female : 1 \_\_\_\_\_ male

## RED-GREEN COLOUR BLINDNESS

### ◆ Alleles, Genotypes and Phenotypes for Colour-blindness

$X_c$  - allele for normal colour vision

$X_c$  - allele for colour-blindness

$X_c X_c$  - genotype of normal female

$X_c X_c$  - genotype of colourblind female

$X_c X_c$  - genotype of carrier female (with normal colour vision, but who can pass the defective gene to her children)

$X_c Y$  - genotype of normal male

$X_c Y$  - genotype of colourblind male

### ◆ Example 3 – Colour Blindness

A male with normal vision ( $X_c Y$ ) and a colourblind female ( $X_c X_c$ ) have children. The possible genotypes and phenotypes of the children are ...

	$X_c$	$Y$
$X_c$	$X_c X_c$	$X_c Y$
$X_c$	$X_c X_c$	$X_c Y$

Possible genotypes = \_\_\_\_\_

Possible phenotypes

= \_\_\_\_\_

### ◆ Example 4 – Colour Blindness

A carrier female ( $X_c X_c$ ) marries a normal-visioned male ( $X_c Y$ ). The possible genotypes and phenotypes of the children are...

	$X_c$	$X_c$
$X_c$	$X_c X_c$	$X_c X_c$
$Y$	$X_c Y$	$X_c Y$

Possible genotypes

= \_\_\_\_\_

Possible phenotypes

= \_\_\_\_\_