Sex Determination in Humans

Chromosomes and Human Genetics

11.3
11.3 In Question

List all the possible mechanisms for genetic recombination of alleles.
III. Sex Determination in Humans

A. Karyotype analysis reveals:

1. All normal human eggs carry only one X chromosome.

2. Half of the sperm carry an X, the other half carry a Y.
Figure 11.4  Pattern of sex determination in humans.
B. Gender of human offspring are determined thus:

1. If an X-bearing sperm fertilizes an X-bearing egg, a female results.

2. If a Y-bearing sperm fertilizes an X-bearing egg, a male results.

C. The Y chromosome carries a male-determining gene that is Y-linked.
8 Week Embryo
External appearance of developing human reproductive organs

Y chromosome present

7 weeks

10 weeks

penis

birth approaching

Y chromosome absent

10 weeks

vaginal opening

birth approaching
Duct system in early embryo that becomes the reproductive system

Y chromosome present

- testes

Y chromosome absent

- ovaries

- uterus

- vulva

- testis

- penis
D. There are also genes on the sex chromosomes that code for nonsexual traits.

- red-green color blindness
- hemophilia
Which sex would an individual with XXY sex chromosomes be?

a. female
b. male
c. both
d. neither
e. impossible to tell