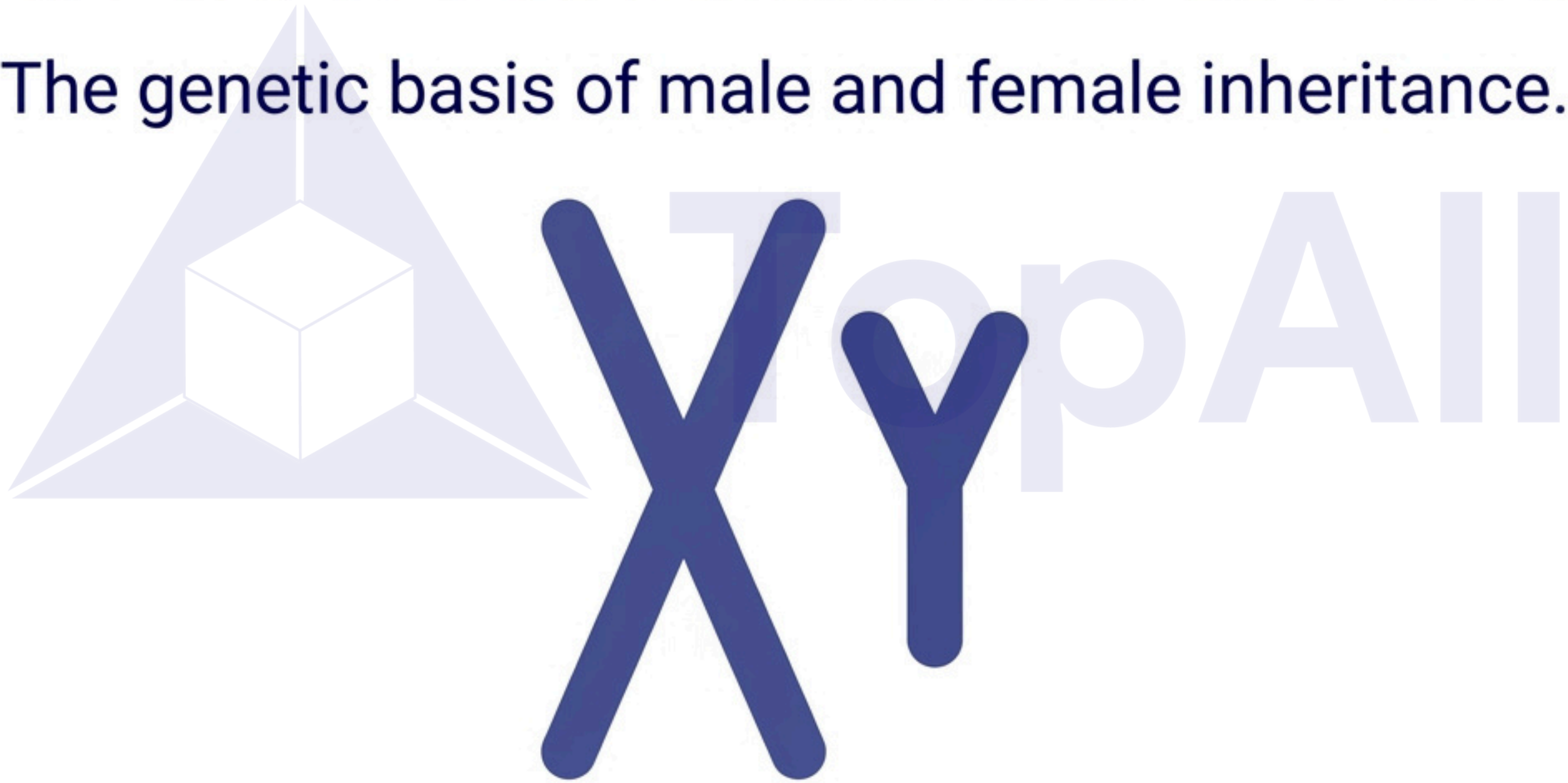


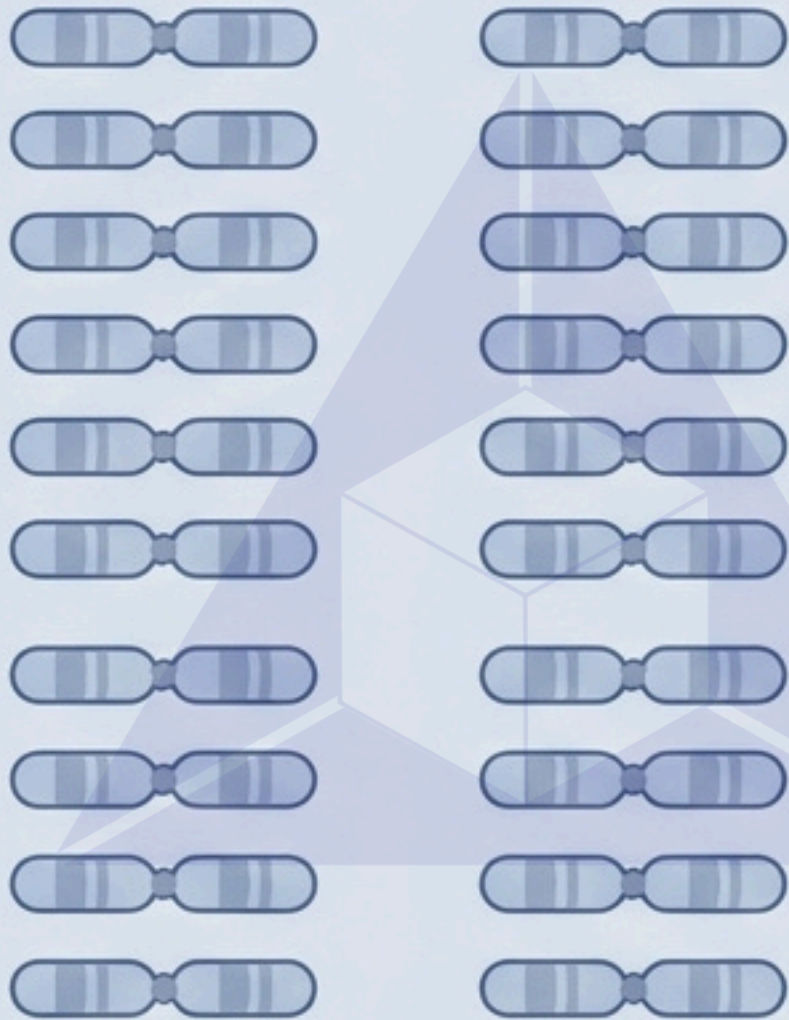
SEX DETERMINATION

The genetic basis of male and female inheritance.



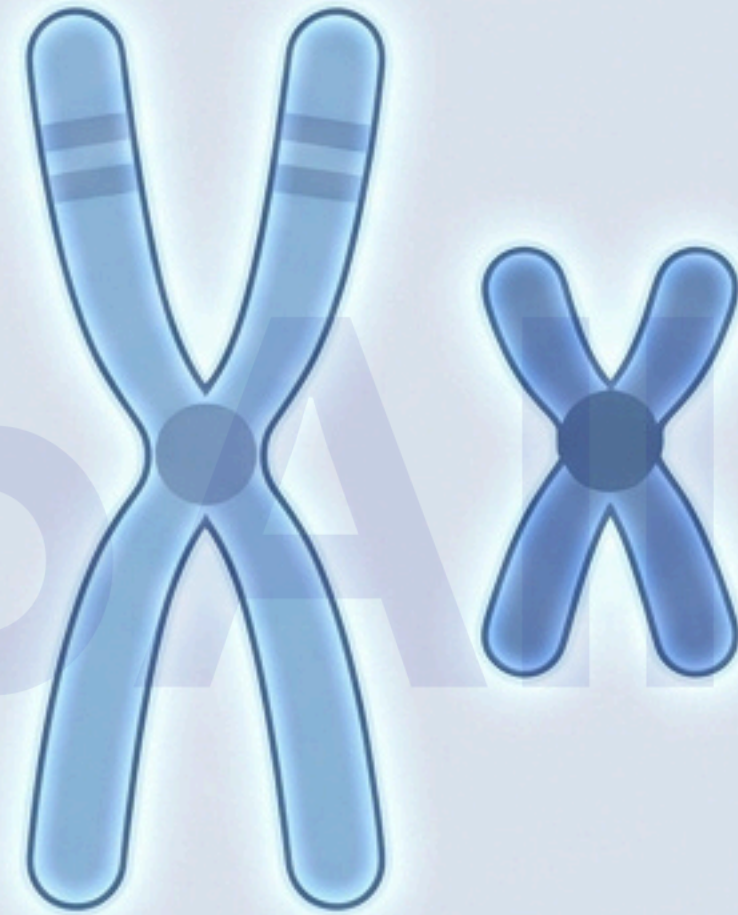
Dividing the Genome

Autosomes: 22 pairs.



These chromosomes are exactly the same in both males and females. They regulate general body characteristics.

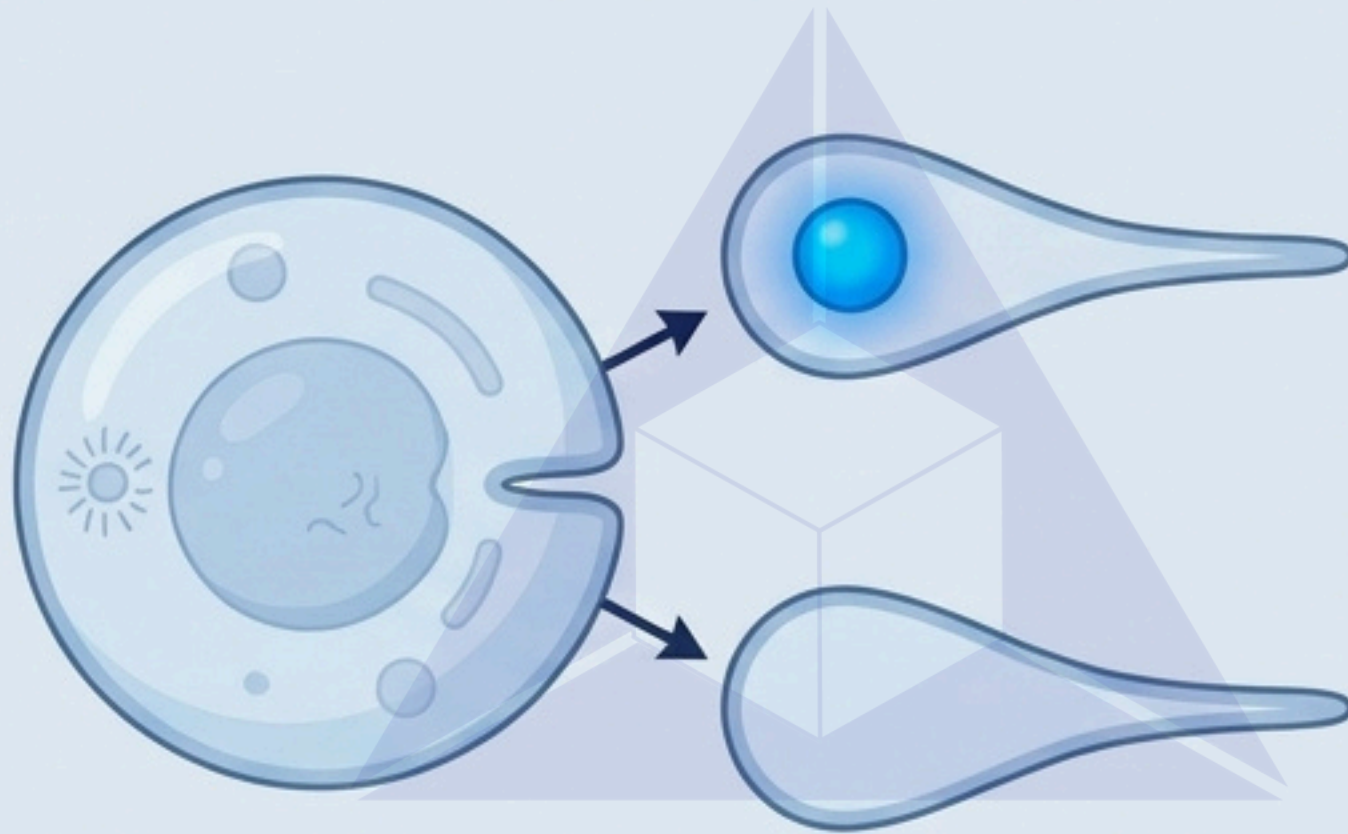
Sex Chromosomes: 1 pair.



This final pair contains the specific genetic code that determines the biological sex of the organism.

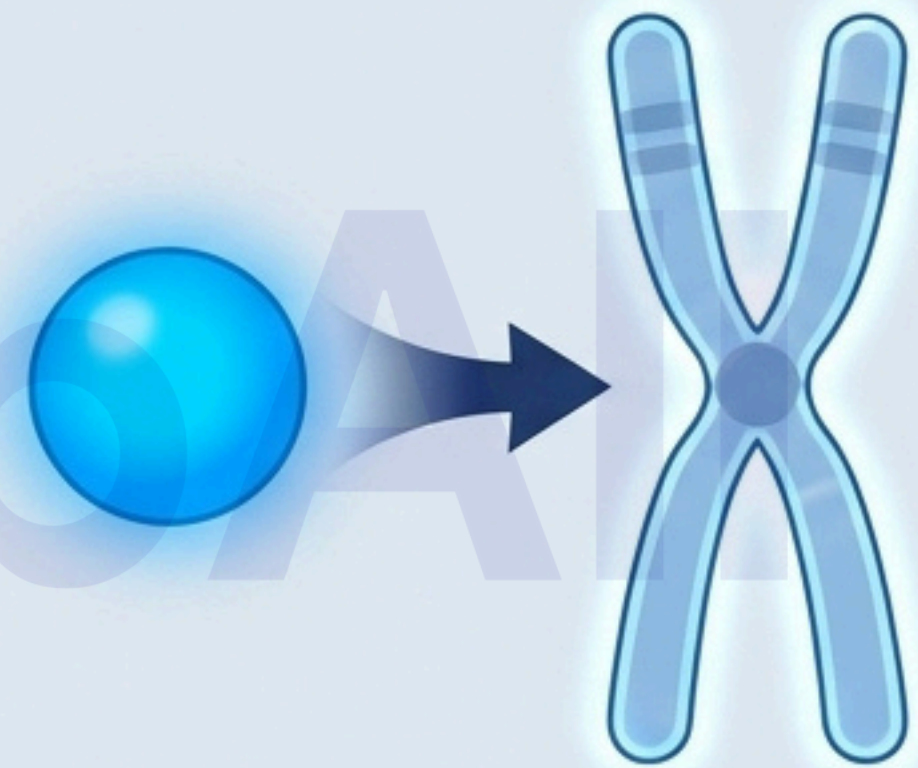
The Mystery of the "X Body"

1891 Observation



Henking observed that exactly 50% of insect sperm received a specific nuclear structure during spermatogenesis. He named it the 'X body'.

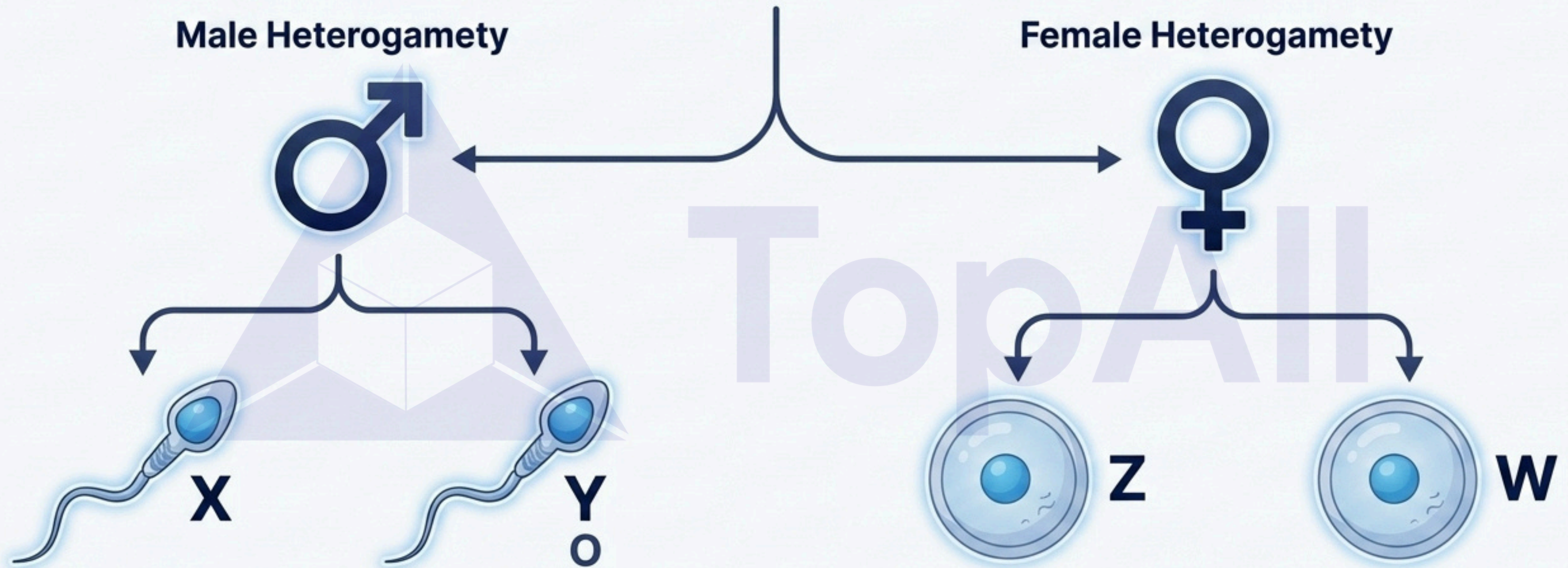
Modern Conclusion



He could not explain its significance. Later scientists confirmed the 'X body' was actually a chromosome—giving rise to the modern name: the X chromosome.

Who Decides? The Rule of Heterogamety

Biological sex is determined by the parent who produces two different types of gametes.



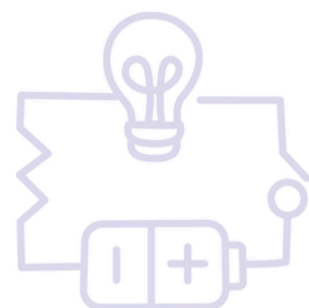
The male produces two different types of gametes.
The female produces only one type of egg.

The female produces two different types of gametes.
The male produces only one type of sperm.



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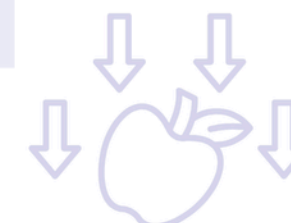
Practice Now



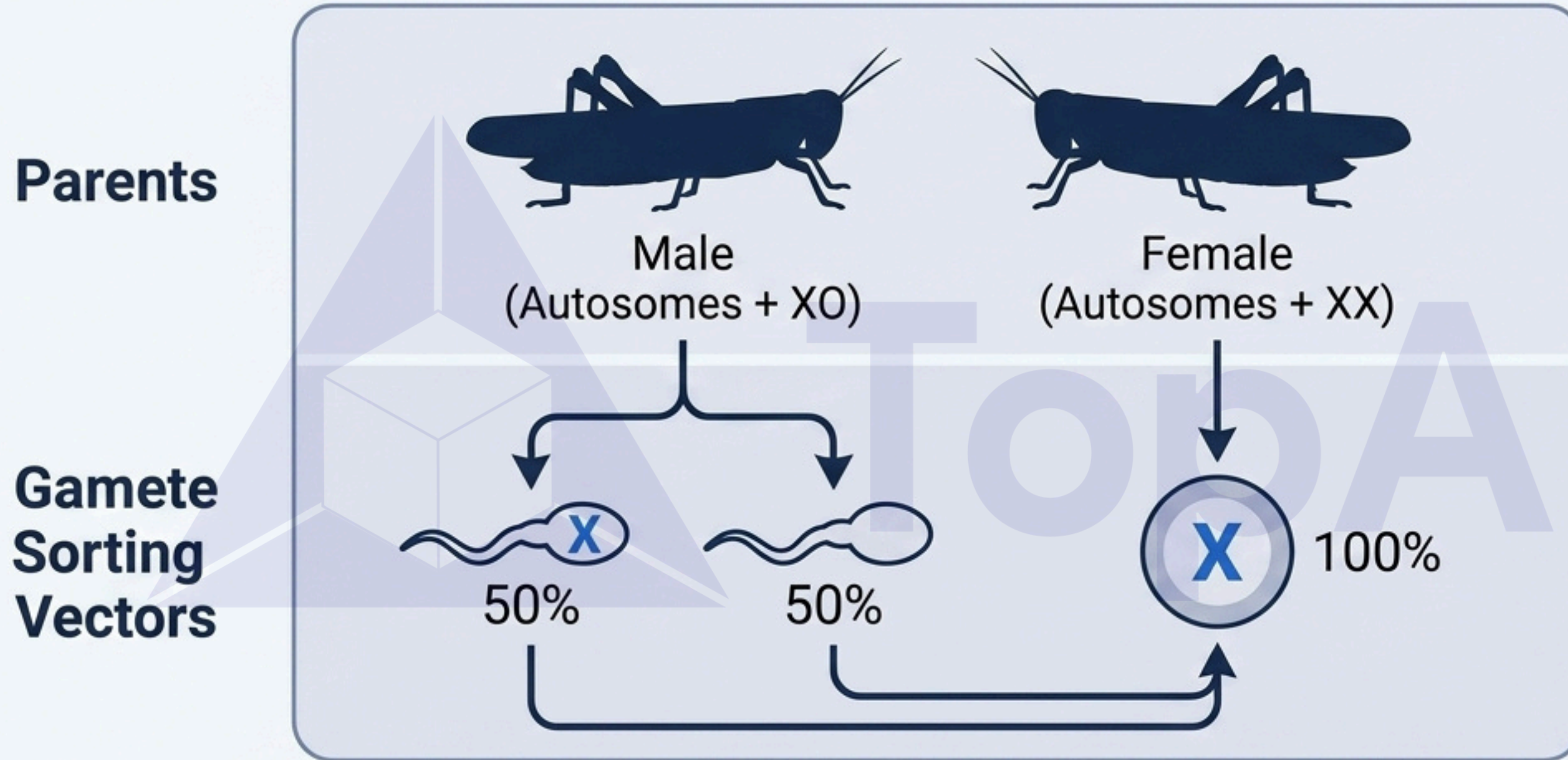
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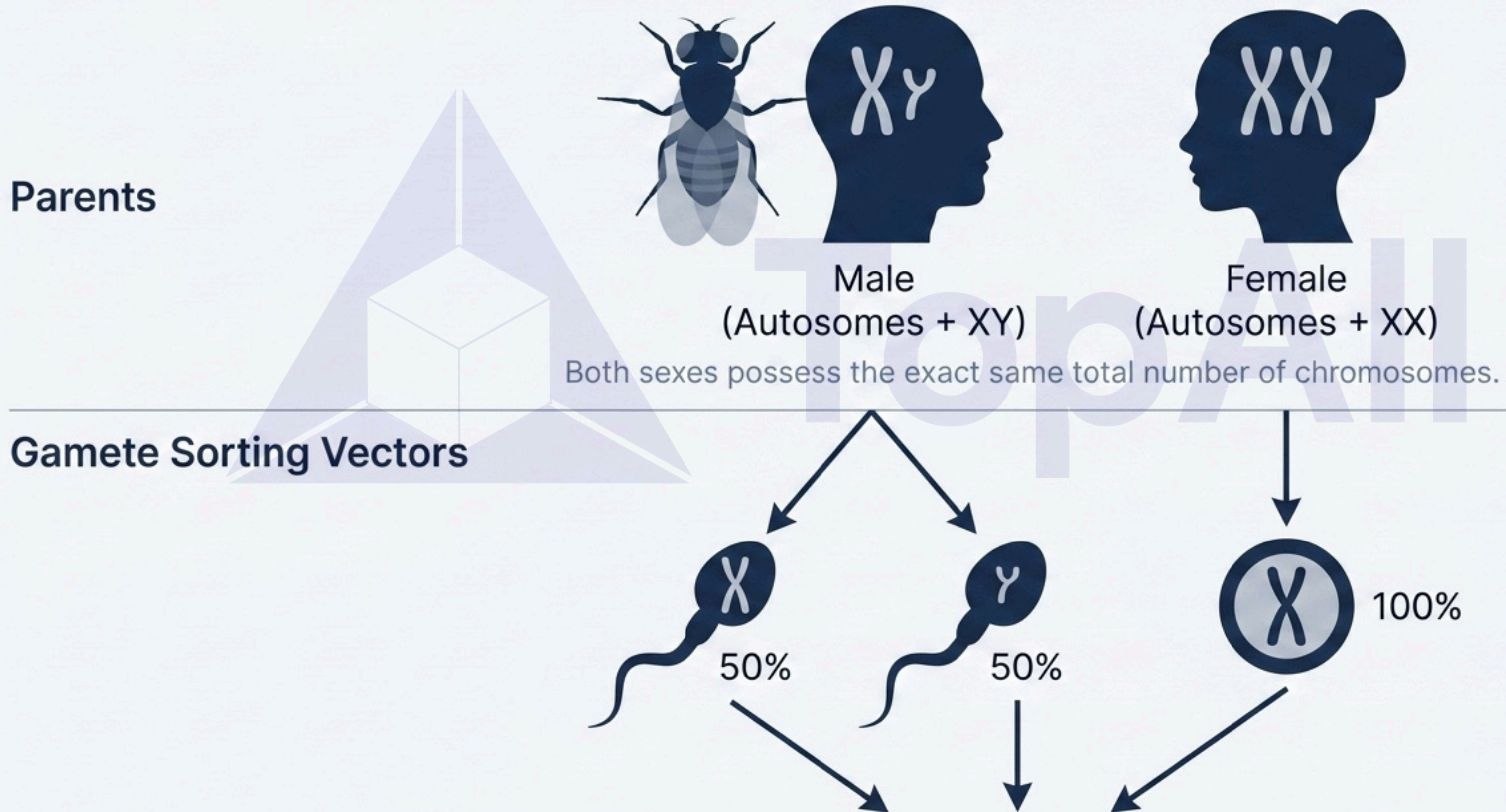


The XO System

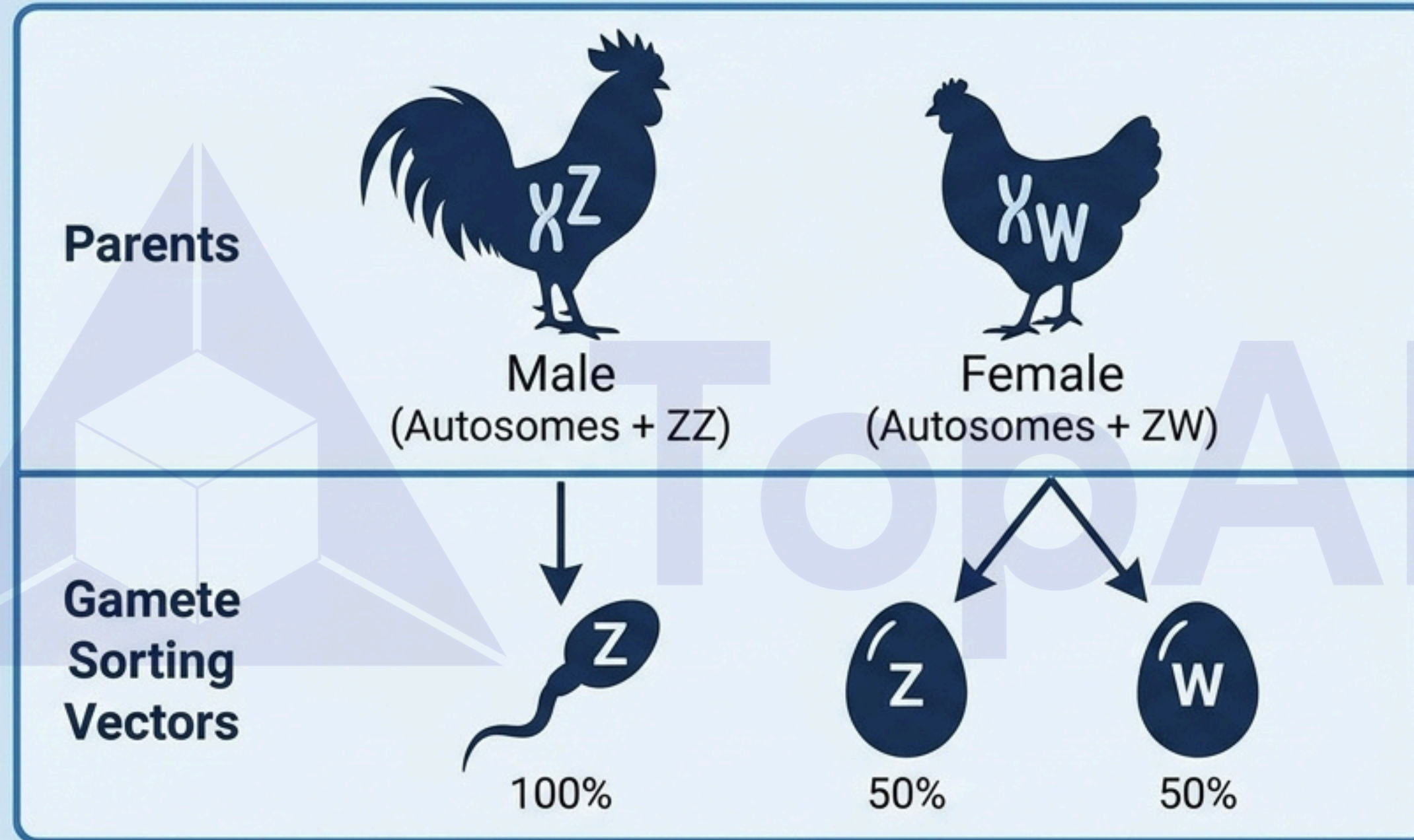


0 means Zero! Grasshopper males literally have one fewer chromosome than females. The missing chromosome is represented by “0”.

The XY System



The ZW System



Flipping the script: We use Z and W letters to prevent confusion with the human XY system. The concept is identical, but in birds, the female is the heterogametic decider.

The Mathematics of Human Sex



Genetics vs. Societal Myths



Society has historically blamed women for the sex of a child, leading to the ostracization and ill-treatment of mothers giving birth to females. This is a biological impossibility.

Because females produce only X-bearing ova, the genetic makeup of the fertilizing sperm strictly determines the biological sex of the offspring. The male gamete is the sole deciding factor.

The Sex Chromosome Matrix

System Name	Heterogametic Sex	Male Genotype	Female Genotype	Example Species
XO System	Male	Autosomes + XO	Autosomes + XX	Grasshoppers
XY System	Male	Autosomes + XY	Autosomes + XX	Humans, Drosophila
ZW System	Female	Autosomes + ZZ	Autosomes + ZW	Birds

Final Synthesis

**Different species use
different sex
chromosome systems.**



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