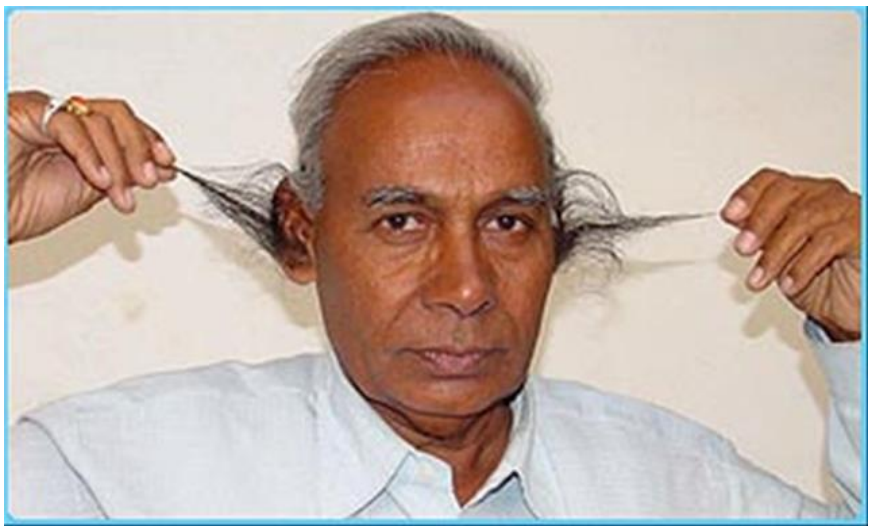
The chromosome theory of inheritance

- The fact that are genes located on specific locations on the chromosome was finally worked by Sutton and Boveri in 1903. These two scientists state also that the behavior of chromosome during Meiosis can be explained according to Mendel law.

Sutton and Boveri

Holandric inheritance

- The holandric inheritance (males related inheritance) found only in males because only males have the Y chromosome, for example the **hairy pinna** trait genes found on the Y chromosomes.



Eyes color in *Drosophila*

- In 1910, Morgan and his students studied the inheritance of eye color in *Drosophila* and they found that the eye color is an inherited trait because the causative gene is located on X chromosome not Y chromosome.
- Red color was dominant to white.
- Morgan found that if he mate between:

Males	Females	Condition	Result
X^rY	X^RX^R	Homozygous female	all of the offspring had red eyes
X^RY	X^rX^r	Homozygous female	The males had white eyes
X^RY	X^RX^r	Heterozygous female	Only half of the males had red eye

These results help Morgan to hypothesize that the eye color gene is located on **X chromosome but not Y chromosome.**

- **The female since she had two X chromosome, she may be Homozygous or Heterozygous.**
- **The male have only one X chromosome so he is Hemizygous.**

Color Blindness

- The color blindness caused by a recessive gene carried on the X chromosome.
- Most color blind people are unable to see things clearly as normal people, they are unable to see red, green or blue light.

State	Female (genotype)	Male (genotype)
Normal vision	X^CX^C	X^CY
Carrier	X^CX^c	----------
Affected	X^cX^c	X^cY

Hemophilia

Is a deficiency in a protein necessary for normal blood clotting. It occurs in males more than females.

State	Female (genotype)	Male (genotype)
Normal vision	X^HX^H	X^HY
Carrier	X^HX^h	X^hY
Affected	X^hX^h	X^hY